National Quality Forum

TO: Consensus Standards Approval Committee

FR: Tim Ferris and Ann Monroe

RE: Ingenix request for reconsideration of cost of care measures

DA: February 7, 2012

Ingenix has submitted a letter requesting reconsideration of four measures received on January 23, 2012 (attached); three were not recommended for endorsement by the Resource Use Steering Committee and have not been released for member vote and one measure (ETG based diabetes cost of care) had a split vote from the Committee and was already balloted by the membership.

Measures Not Recommended:

- (1591) ETG Based Congestive Heart Failure (CHF) Cost of Care
- (1594) ETG Based Coronary Artery Disease (CAD) Cost of Care
- (1599) ETG Based Non-Condition Specific Cost of Care

BACKGROUND

The Resource Use Project seeks to endorse cost and resource use measures, which will serve as building blocks for efficiency of care measures in the future. For this multi-phased process, four condition-focused Technical Advisory Panels (TAPs) for pulmonary, cardiovascular and diabetes, bone and joint, and cancer conditions were convened to assist the project's 23-member Steering Committee in making recommendations.

The measure review process was divided into two cycles. Cycle 1 focused on cardiovascular, diabetes, and non-condition specific measures. The cycle 2 measure review process was narrowed to two condition areas: bone/joint and pulmonary [all cancer measures were withdrawn by the developer, ABMS during review]. Four condition-specific episode-based measures submitted by Ingenix from cycle 1 transitioned to cycle 2 due to changes in measure specifications (i.e., costing approach).

The Steering Committee recommended four cost and resource use measures for endorsement in cycle 2. Six condition-specific episode-based measures submitted by Ingenix were not recommended and one diabetes episode-based measure submitted by Ingenix had a split vote.

Cycle 2 Measure Disposition:

Recommended by the Committee:

- (1560) Relative Resource Use for People with Asthma (NCQA)
- (1561) Relative Resource Use for People with COPD (NCQA)
- (1611) ETG-Based Pneumonia Cost of Care (Ingenix)
- (1609) ETG/PEG Based Hip/Knee Replacement Cost of Care (Ingenix)

NOT Recommended by the Committee:

- (1605) ETG-Based Asthma cost of care (Ingenix)
- (1608) ETG-Based Chronic Obstructive Pulmonary Disease (COPD) Cost of Care (Ingenix)
- (1591) ETG-Based Congestive Heart Failure (CHF) Cost of Care (Ingenix)
- (1594) ETG-Based Coronary Artery Disease (CAD) Cost of Care (Ingenix)
- (1603) ETG-Based Hip Fracture Cost of Care (Ingenix)
- (1599) ETG-Based Non-Condition Specific Cost of Care (Ingenix)

No Consensus (split vote):

- (1595) ETG-Based Diabetes cost of care measure (Ingenix)

The Cycle 2 draft report, was posted for the member voting period on January 20 in which the split vote measure and the four recommended measures were included on the voting ballot. The CSAC will review the member voting results and make final recommendations for these measures during the March in person meeting.

NQF PROCESS

NQF policy states that "measures not approved by the Steering Committee will be reviewed by the CSAC Chair and Vice-Chair, who have the option of requesting additional expert input. If the CSAC Chair and Vice-Chair both concur that a measure not advanced by the Steering Committee should be reinstated, the disputed measure(s) will be included in the slate for balloting."

NEXT STEPS

Given the complexity of the project, we propose that a small CSAC workgroup be asked to consider the committee process and evaluation issues for the three resource use measures. The following CSAC members will be asked to serve on the workgroup:

- Dennis White
- Kristine Martin Anderson
- Frank Opelka
- Andy Baskin
- Art Levin

The workgroup will be asked to prepare a consensus statement (preferable) or majority and minority opinions in advance of the March meeting. We will ask for comment/input from the full CSAC at the in-person meeting prior to making our final decision on the request. All relevant materials, including the measure submission, committee evaluations, and comment table, will be shared with the workgroup. In addition, the Resource Use Steering Committee Co-Chairs will provide a detailed response to the request for consideration, including a summary of the Committee's discussion of the measures and rationale for their recommendations.

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cc: Ashlie Wilbon, National Quality Forum

RE: Optum NQF Resource Use Measure Reconsideration Request

Good day,

We want to thank the National Quality Forum (NQF) for their recent efforts in considering healthcare resource use measures for endorsement. Optum (formerly Ingenix) recognizes the organizational commitment made by NQF to these important measures and also the extraordinary amount of work undertaken by NQF, your supporting committees, and those individuals submitting public comments. We applaud NQF and encourage your efforts to endorse appropriate resource use measures in the future.

We also want to thank NQF for providing Optum with the opportunity to submit resource use measures for consideration. In summary, Optum submitted a total of nine measures across Cycles 1 and 2 of the NQF initiative. Eight of these measures described resource use for clinical episodes of care:

- Congestive Heart Failure (#1591)
- Acute Myocardial Infarction (AMI) (#1593)
- Coronary Artery Disease (#1594)
- Diabetes (#1595)
- Stroke (#1596)
- Asthma (#1605)
- Hip/Knee Replacement (#1609)
- Pneumonia (#1611)

The remaining measure described resource use for a population of individuals:

- Population-Based (#1599)

Two Optum measures (Stroke and AMI) were removed from consideration early in the endorsement process for further refinement and testing. Two measures were recommended for endorsement by the Resource Use Steering Committee (Hip/Knee Replacement and Pneumonia). The remaining five measures were not recommended based on final voting by the Steering Committee.

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This note serves to formally request re-consideration for the following four measures submitted by Optum and not recommended by the Steering Committee for endorsement:

- Congestive Heart Failure (#1591)
- Population-Based (#1599)
- Diabetes (#1595)
- Coronary Artery Disease (#1594)

The basis for our request for these measures can be summarized into the following main points:

1. Re-assessment and re-voting of measures by the Steering Committee based on NQF request for standard-priced and actual-priced measure specifications.
2. Steering Committee deliberations on selected components of the usability and feasibility criteria and their impact on final recommendations.

We address each point separately below.

1. Re-assessment and re-voting of measures by the Steering Committee based on NQF request for standard-priced and actual-priced measure specifications.

Our first concern relates to a change in the Steering Committee recommendation for three of the above four measures following a re-vote.[1] In particular, the CHF (#1591), Diabetes (#1595), and Population-Based (#1599) measures were recommended for endorsement by the Steering Committee in July 2011. This vote was based on our original submission to NQF which included clinical logic describing each measure's episode methodology, a type of service methodology designed to support results at an actionable level, and the approach used to risk adjust measures to support equitable comparisons. Our measure submission also provided guidance for measure users that either standard priced or actual priced costs were appropriate for determining resource use. Standard-priced measures of costs use a pre-determined fee schedule and apply the same unit pricing assumptions across all services. Actual priced costs are based on the amounts reimbursed for the services performed, typically defined using the total allowed payments for a service. Both approaches are used today in resource use measurement, with actual priced costs being very much the norm, in particular for applications of physician measurement. The original submission form requested by

[1] Optum's Coronary Artery Disease (#1594) measure was also subjected to a re-vote following specification as an actual-priced measure. However, this measure was not given a passing vote by the Steering Committee in July, 2011. We are requesting reconsideration of this measure based on the second point noted above (deliberations on usability and feasibility). As a note, the Steering Committee passed this CAD measure on two key criteria established by NQF for endorsement, Importance and Scientific Acceptability (Importance: 16Y/1N; Scientific Acceptability: 12Y/5N). Our interpretation is that this measure failed based on usability and feasibility alone.

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NQF did not require a detailed specification for how actual or standard prices were to be determined, allowing users an ability to decide on the most appropriate approach to be used for the measurement application.

Based on our original submission, Optum's CHF, Diabetes, and Population-based measures were recommended for endorsement by the Steering Committee in July, 2011 with the following *Overall* votes (Y indicates a vote for recommendation; N indicates a vote against recommendation):

- CHF (#1591) – 10Y/8N
- Population-Based (#1599) – 12Y/6N
- Diabetes (#1595) – 11Y/7N

Each of these measures further passed two key criteria established by NQF for endorsement, Importance and Scientific Acceptability (voting shown below):

- CHF (#1591) – *Importance*: 17Y/1N; *Scientific Acceptability*: 14Y/4N.
- Population-Based (#1599) – *Importance*: 16Y/0N; *Scientific Acceptability*: 9Y/6N.
- Diabetes (#1595) – *Importance*: 18Y/0N; *Scientific Acceptability*: 10Y/8N.

When combined with assessments based on feasibility and usability, all three measures received passing votes.

Following the July 2011 vote, NQF made a decision to split each measure into two potential measures based on the costing approach used to define resources: actual-priced costs or standard-priced costs. We were informed by NQF that while our measures provided users the option of actual or standard priced costs, Optum needed to select only one pricing approach for a measure and re-submit the measures for re-vote by the Steering Committee. Optum was given the option to (i) submit the same measure twice with one version recommending standard pricing and the other recommending actual priced costs or (ii) submit the same measure using one of the pricing approaches. Where a standard-priced version of the measure was submitted, a detailed standard-pricing specification was to be included. No part of a measure's original clinical logic, risk adjustment or other methodology was to be altered. Each newly submitted measure was then subject to a re-vote. No indication was given by NQF regarding a preference for actual or standard-priced measures, or a requirement for both versions of a measure to be submitted to receive appropriate consideration.

Optum re-submitted measures using an actual-priced methodology. Our decision to submit actual-priced cost measures was based on a number of factors. First, actual-priced resource measures are the most widely used approach to physician and healthcare measurement in the industry – by health plans, providers and government organizations. Actual priced measures are also the most-straightforward to implement and interpret by physicians and other key stakeholders, which specifically addresses NQF criteria relating to Feasibility and Usability. More importantly, the development of a

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precise specification for determining standard prices for submission would have required a longer period of time than the NQF process allowed.

Optum has extensive experience in developing standard pricing approaches for healthcare measurement, including the standard pricing methodology used by NCQA for the NQF submitted measures (1557) RRU for People with Diabetes (RDI) and (1558) RRU for People with Cardiovascular Conditions. However, comprehensive approaches to standard pricing are most often implemented with significant user-support and validation of the process. NQF's requirement that a methodology be feasibly implemented with accuracy by any user, including a physician or provider, involves an additional level of documentation and consideration for the challenges involved. As an example, the NCQA measures noted above do not include all services in computing resource use. In particular, those services deemed by NCQA's Efficiency Measurement Assessment Panel (EMAP) to be difficult to standard price in a consistent manner across health plans and other users are excluded by NCQA from the RRU measure specifications.

The Steering Committee considered the actual-priced versions of the three measures and the re-vote resulted in the previous endorsement recommendation for all three measures being overturned. The tallies (Overall recommendation) for the re-vote are as follows:

- CHF (#1591) – 6Y/8N
- Population-Based (#1599) – 5Y/9N
- Diabetes (#1595) – 7Y/7N

As noted above, no part of these measures' original clinical logic, risk adjustment or other methodology was altered. These reversals were based entirely on the change in pricing approach requested by NQF itself.

Our interpretation is that the change in endorsement recommendation is based on a preference by the Steering Committee for standard priced measures or having available both standard-priced and actual priced measures. Comments during Steering Committee meetings and meeting notes suggest that this is the case. In particular, one rationale for a preference for standard-priced measures given by the Steering Committee related to the need for standard-prices to support comparisons of physician resource use across geographic regions and the nation. Optum agrees with the Steering Committee that national comparisons of resource use have value in identifying differences in the practice of medicine across different areas, the development of best-practice benchmarks and highlighting opportunities for improvement. We also agree that standard pricing is more appropriate for such national comparisons. However, we also believe there is an important role for measures that use actual pricing because the large majority of physician measurement initiatives are undertaken at a local level. In these cases, actual prices supports more equitable and meaningful comparisons between a provider and their peers and recognizes that the choice of higher-priced providers for referral and other care is a lever available to physicians (and their patients) in improving

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healthcare efficiency. As noted above, we also believe that actual pricing enhances the feasibility and usability of measures implemented at the local level.

The actual-priced cost measures submitted by Optum for re-vote have identical clinical and other methodological components as the same measures endorsed by the Steering Committee in July, 2011. Further, the versions of these measures chosen for submission by Optum, based on actual prices, have far greater utility in supporting current and future initiatives in healthcare resource use than a standard-priced alternative. We agree with NQF that having both actual and standard-priced versions of resource use measures provide benefits and would look forward to an opportunity to work with NQF to support a valid approach to a standard-pricing methodology than can be applied across all resource use measures. However, resource-use measures based on actual prices will provide immediate benefits to the user community and should be considered based on their own merit.

2. Steering Committee deliberations on selected components of the usability and feasibility criteria and their impact on final recommendations.

NQF identified Importance, Scientific Acceptability, Feasibility and Usability as key criteria identified by NQF for the evaluation of resource use measures. Optum agrees with NQF that these criteria are all important in supporting consistent and valid implementation of endorsed measures and transparency into measure results. As noted above, all four Optum measures we are requesting for reconsideration were passed by the Steering Committee for Importance and Scientific Acceptability. This evaluation by the Steering Committee for Scientific Acceptability included a 14Y/4N vote for CHF and a 12Y/5N vote for CAD.

Our interpretation is that the failure of these four measures is based primarily on the assessments by the Steering Committee around Feasibility and Usability. We do not agree with all deliberations, assumptions and conclusions by the Steering Committee regarding our measures and these two criteria. Further, discussions in these two areas by the Steering Committee had a measurable impact on the overall voting for the four Optum measures cited above.

In particular, there are four key points that warrant further consideration when assessing the Feasibility and Usability of the Optum measures:

a. Measure complexity;
b. Sample size and usefulness in measuring individual physicians;[2]
c. The impact of “carve-out” services (missing data) in measure application; and
d. Cost of implementation.

[2] Note that sample size and the impact of carve-out services are also relevant in a discussion of Scientific Acceptability. Scientific Acceptability is also addressed for these key points in our discussion here.

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We address each point separately below.

a.Measure complexity. Resource use measures and the methodologies and groupers that support them are inherently more complex than quality measures. This complexity derives from a number of requirements, including strategies to leverage all meaningful diagnostic, procedural and timing information, approaches to avoid double counting in measurement, and methods to risk adjust for differences in patient need given their clinical characteristics. Appropriate methodologies designed to address these requirements will enhance the validity of the measures and the accuracy of the measure results. Measures that employ more complex methodologies to meet this need should not be penalized.

As an example, the ETG episode methodology underpinning Optum's submitted measures includes an approach to trigger episodes for each condition or event, gather services to each episode, define episode begin and end dates, and risk adjust the resulting episodes to support valid comparisons. In the process of gathering services to each episode, a patient can have open episodes for multiple conditions and individual services such as visits, procedures and inpatient stays can qualify clinically for more than one episode. Assigning a service to multiple episodes is not an acceptable alternative and will lead to the double-counting of resources when evaluating physician cost of care. In these instances, a methodology is required to identify the best clinical match for a service for each episode. ETG applies such a methodology, including a detailed clinical knowledge base that ranks procedure and diagnosis combinations and a hierarchical approach to optimize grouping. Further, valid episode grouping cannot be supported by clinical logic that focuses only on a single condition such as CHF. When assigning a service to a single episode, an episode grouper requires consideration of the clinical eligibility of that service in the context of all relevant conditions – CHF and other. Such an approach improves grouping accuracy but also requires a level of methodological complexity to support its application.

Measure transparency and implementation also relate to required measure complexity. Optum has worked with a wide range of healthcare organizations to support the understanding and transparency of our methodologies, including a public web-site that exposes all details of the ETG approach in a measured way, including clinical tables. Measure users can refer physicians and other stakeholders to the Transparency site to support an understanding of measures and measure results.

In terms of implementation, we agree with NQF that there will be challenges in deploying a comprehensive episode of care methodology. As with risk methodologies such as the CMS-HCC model or the Johns-Hopkins ACG approach, analytic software is employed by ETG users to both limit the burden of measure implementation and also to ensure valid and consistent application. As a further example, many health plans work with licensed HEDIS vendors to support the implementation of both the HEDIS RRU measures and HEDIS quality measures.

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Finally, the ETG-based resource measures submitted by Optum have been in use in the measurement community for more than a decade and have provided significant value and insights to users. These users include providers who are the fastest growing segment of the user community for these tools. Health plans, employers, and physicians have obtained a sufficient comprehension of these measures to understand results and support efforts to improve care.

We agree with NQF that transparency is required into all aspects of a measurement methodology and effective strategies are needed to support valid measure application. Feasibility is an important element when evaluating measures. However, we also recognize that trade-offs exist between Feasibility, measure complexity and Scientific Acceptability. In particular, Scientific Acceptability demands a methodology that defines episodes and gathers services to them in a valid way, and that is necessarily a somewhat complex issue. For example, many discussions with the NQF Technical Assessment Panels around Scientific Acceptability were around potential changes to methodology that would have added further complexity. Increased complexity will impact Feasibility. Measures that employ more complex methodologies to support more valid measurement should not be penalized.

b. Sample size and usefulness in measuring individual physicians. We agree with NQF that a sufficient sample size is required to provide any sense of measure performance for a provider or other entity. However, sample size alone is not sufficient. As part of our measure submission, we provided a clear recommendation to measure users to also apply confidence intervals or another appropriate statistical test in making comparisons of resource use. NCQA includes the same requirement for cost of care and its PHQ certification program. Whether individual physicians or groups are measured is less important than the precision of the measurement and how well it represents the performance of the physician(s) being measured. If a measure can support valid assessment of some individual physicians as well as groups, users should not be restricted in its application. As a note, NQF has endorsed many quality measures with lower prevalence than the condition measures submitted by Optum, including physician quality measures for CHF.

c. The impact of "carve-out" services (missing data) in measure application. The Steering Committee noted correctly that not all healthcare services may be available to support resource use measurement for an application. In particular, health plans and other organizations may not cover certain services or these services may be "carved-out" for management by another entity. As examples, pharmacy services are often managed by a physician benefits manager (PBM) and behavioral health services can be managed by a third-party care management vendor. In these examples, health plans and other organizations may face challenges in having complete data to support resource use measurement.

Throughout the discussion of the Optum measures, the Steering Committee highlighted the issue of carve-out services and their impact on the Scientific Acceptability and

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Feasibility of our measure submissions. In particular, this discussion focused on pharmacy and behavioral health services. Our submission of measures appropriately handled each of these issues and the measures should not be penalized for this point. In particular:

- Pharmacy data. Given that differences in the availability of pharmacy data across individuals is a common scenario, our measure submission included a specific methodology to appropriately adjust measure results for individuals without pharmacy data available. This methodology uses the same approach as that employed by NCQA in the HEDIS RRU measures recommended by the Steering Committee and will support valid measurement.
- Behavioral health data. We also discussed the issue of behavioral health carve-outs with the Steering Committee on multiple occasions and agree with the Steering Committee that missing behavioral health data is not acceptable in the application of the measure – it will impact both the total resource costs measured and also our risk adjustment methodology which recognizes the presence of behavioral health comorbidities. Other than pharmacy data, our measure specification does not allow for missing service information, whether from behavioral health or other services.

d. Cost of Implementation. A focus of the Steering Committee around Usability and Feasibility was the cost to the user of implementing our measures. As noted by NQF and the Steering Committee, our methodologies are most often implemented using a software grouper that supports both the encapsulation of the methodologies and also their precise application. This software also provides significant value to users in terms of the breadth of measures delivered (measures beyond those that are a focus of the NQF Cycle 1 and Cycle 2 measures) and also results that support other analytic needs. Further, as noted above, valid episode grouping cannot be applied in isolation for a condition – episodes needs to consider the entire clinical context for a patient and requires the clinical breadth delivered with our standard grouper software.

Users of the Optum episode grouping software pay a license fee that covers the expense of innovation, the development and maintenance of our episode methodologies, and the features and value delivered with their application. It also should be noted that the Steering Committee has recommended other measures that involve licensed commercial grouper software to deliver methodology and its implementation, including the HCC and ACG risk methodologies.

Our interpretation is that the Steering Committee was influenced significantly by both the need for grouper analytic software to support appropriate measure application and also the cost of that software. As described above, valid resource use measures involve a level of complexity beyond that related to quality measures and are best implemented using some form of analytic software. Optum employs a licensing strategy for our software that reflects the cost of innovation and its development and implementation. Optum also allows substantial discounts to provider organizations, public initiatives and research organizations. Details of this licensing strategy were shared with NQF as part

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of our submission and we do not believe that our license fees represent a significant barrier to the use of our measures. Health plans, employers, provider organizations, government agencies and other entities covering more than 80% of the insured population license our grouping software and have received significant value from this use. NQF should recognize the value of analytic software in supporting resource use measures, the role and cost of continuous innovation, and the experience of Optum's user community in making informed decisions to both license our analytic software and apply these analytics to support measurement and improvement.

We appreciate your consideration in re-evaluating these measures. We strongly believe that these measures are important, have scientific merit, and can continue to contribute significant value to the measurement community and to the improvement of healthcare in the United States. We strongly urge NQF to consider our request for the re-evaluation and endorsement of these measures. We look forward to hearing from you in the near future.

Best regards,

Dan Dunn, Ph.D.
Senior Vice President, Business Solutions
OptumInsight

National Quality Forum

TO: Consensus Standards Approval Committee

FR: Tom Rosenthal, MD, Resource Use Steering Committee Co-Chair
Bruce Steinwald, MBA, Resource Use Steering Committee, Co-Chair

RE: Response to Ingenix (Optum) request for reconsideration of cost of care measures

DA: February 17, 2012

Background

On January 23, 2012 Ingenix (Optum) submitted a letter requesting reconsideration of four measures; three were not recommended for endorsement by the Resource Use Steering Committee and one measure had a split vote from the Committee.

Not Recommended**:**

- (1591) ETG Based Congestive Heart Failure (CHF) Cost of Care
- (1594) ETG Based Coronary Artery Disease (CAD) Cost of Care
- (1599) ETG Based Non-Condition Specific Cost of Care

Split Committee Vote**:**

- (1595) ETG Based Diabetes Cost of Care

As Co-Chairs of the Resource Use Steering Committee, we provide this detailed response to the issues outlined in the Ingenix request, rationale for Committee recommendations, and supporting materials for workgroup review. It is our hope that this information will assist the multi-stakeholder workgroup of CSAC members understand and evaluate the recommendations of the Resource Use Steering Committee.

Overview of Review Process

In the developer's request for reconsideration, they raise concerns on the Committee's evaluation to specific measure components (e.g., costing approach, usability, feasibility) for measures not recommended for endorsement. It is our belief that the Resource Use Steering Committee did not make judgments across all measures submitted based on a single component within the measure construction. A measure-by-measure decision was made on the appropriateness of specific measure components (e.g., costing approach, usability, feasibility) given other measure characteristics. The Committee examined the reliability and validity of each measure individually through the interaction of the measure's specified level of measurement, risk adjustment model, clinical logic, and other measure characteristics. Final recommendations were made on each measure as a whole, weighing each of these components against the criteria.

Evaluating the Steering Committee's review process in hindsight allows one to identify limitations broadly across all of the measures not recommended for endorsement; however, this was not process by which the Steering Committee evaluated the measures. *The Steering*

Committee did not believe that all Ingenix measures submitted to this project were limited by any one single element (e.g., use of actual prices, limited usability or feasibility). In fact, the Committee evaluated each of the measures individually against all of the criteria; a process that resulted in two Ingenix measures (#1611 ETG-based Pneumonia Cost of Care and #1609 ETG-based Hip/Knee Cost of Care) moving forward as recommended measures, and one resulting in a split vote (#1595 ETG-based Diabetes Cost of Care) .

While we provide responses to concerns raised by the developer for each of the measure components, this should not be interpreted as the reason why any particular measure was not recommended for endorsement. It is our assessment that the process of evaluating these measures was fair and consistent throughout the process and that the Committee reached the appropriate conclusions in our recommendations.

Brief Summary of Measure-Specific Review

Measure	Committee Votes	TAP/Committee Concerns
(1591) ETG-based congestive heart failure (CHF) cost of care	Initial vote (Recommended): Yes-10, No-8 Revote (Not Recommended): Yes-6, No-8	• The Committee raised concerns on the completeness and accuracy of the measure due to the exclusion of diastolic failure (which is a separate ETG).
(1594) ETG-based coronary artery disease (CAD) cost of care	Initial vote (Not Recommended): Yes-8, No-10 Revote (Not Recommended): Yes-5, No-9	• The measure including a wide-range of conditions from chronic, stable coronary artery disease to patients with cardiogenic shock complicated by a flail mitral posterior leaflet. • The Committee agreed that this range of conditions would have a wide range of expected costs and whether the populations are similar enough that the user can reasonably make inferences about the resource use
(1595) ETG based diabetes cost of care*	Initial vote (Recommended): Yes-11, No-7 Revote (Split Vote): Yes-7, No-7	• The Committee was concerned that the measure does not capture costs related to the sequelae that result from diabetes (e.g., eye disease) because they trigger alternate episodes. • Episode trigger mechanisms are not clear. Specifically, a patient can enter in the middle of the 12-month episode and the episode is marked incomplete.

This measure was released for member vote and will be subject to CSAC vote for a final recommendation during the March in-person meeting.

(1599) ETG-based non-condition specific cost of care	Initial vote (Recommended): Yes-12, No-6 Revote (Not Recommended): Yes-5, No-9	• The Committee was concerned with the non-condition specific measure since it is a compilation of all of the condition-specific episodes. Since there were significant issues raised on individual episodes within the grouper, the Committee questioned the validity of the total cost measure. • The measure does not have exclusions for extreme high cost outliers or indicators for carve out arrangements.

Recurring Issues Identified During Measure Review

While the TAPs and Steering Committee evaluated each individual measure on its own merits, they identified several recurring issues that spanned all of the Ingenix measure submissions. The two most prominent were concerns on how the risk adjustment model is constructed and the inadequate demonstration of reliability and validity testing of the measure.

Risk Adjustment Concerns

- The risk adjustment methodology adjusts for comorbidities identified during the measurement period. The Committee was concerned that this modeling approach is unable to distinguish between complications of care and comorbidities in the risk adjustment model; the modeling approach appears to be circular.
- The submission forms did not adequately describe the variables selected for inclusion in the risk adjustment model, did not provide information on the calibration of the risk model, and many of the submissions were missing the R-squared statistic. This information was requested in the submission form; however, the developer only provided this information for the diabetes measure when specifically requested by the Steering Committee.
- The Committee had difficulty understanding from the materials provided by the developer on how the risk groups and severity levels were defined. The developers explained that the risk groups are selected based on the cutoff defined by the severity score. The rationale and descriptions of this severity score methodology was unclear and inadequately described.
- A sample of the risk adjustment testing documentation submitted is attached to this memo for the diabetes measure #1594. Document name: 1594_S10_Risk Adjustment.xls

Measure Reliability & Validity Testing Concerns

- The developers did not provide sufficient testing information to adequately demonstrate reliability and validity testing. A sample of the reliability and validity testing information is attached. Document name: 1594_SA_Reliability_Validity.pdf

- The developers often relied on face validity; however, no description of the method or results was provided in the submission – required in the measure evaluation criteria for face validity. The tables that were submitted to demonstrate validity are not clearly labeled or defined.

Response to Concerns Outlined in the Letter

In the letter of reconsideration, Ingenix raised several specific concerns. These concerns were classified on the basis of two main points:

1. Re-assessment and re-voting of measures by the Steering Committee based on NQF request for standard-priced and actual-priced measure specifications.
2. Steering Committee deliberations on selected components of the usability and feasibility criteria and their impact on final recommendations.

Several issues related to these points have been excerpted below with our corresponding response:

1. Re-assessment and re-voting of measures by the Steering Committee based on NQF request for standard-priced and actual-priced measure specifications.

- *"NQF did not require a detailed specification for how actual or standard prices were to be determined, allowing users an ability to decide on the most appropriate approach to be used for the measurement application." (pg. 3)*

  Response: The NQF measure submission process and criteria (2a.1) require that detailed specifications are provided for the entire measure such that a user would be able to consistently implement the measure. Each of the developers was required to specify a pricing approach and provide a detailed specification to implement their approaches. While the resource use measure submission form allowed for certain items to be submitted as guidelines or specifications enabling user flexibility, the costing approach was not one of these items. The Resource Use Measure Submission Guidance document was posted in advance of the submission period, in which Item 10.3 for Costing Method details the information required for this item:

  > "Costing methods may include the actual amount paid or an approach that allows users to compare the use and intensity of health services while holding actual paid amounts constant (e.g., standardized prices). Detail the costing method, e.g., none (utilization count), approach to estimate standard dollar, standard dollar provided. If the measure does not include a costing method, please provide a rationale. Attach any costing or standard price tables under item 7.2, Data Source or Collection Instruments."

- *"Following the July 2011 vote, NQF made a decision to split each measure into two potential measures based on the costing approach used to define resources: actual-priced costs or standard-priced costs." (pg. 3)*

Response: In May 2011, during the review of the first resource use measure by the Committee in which the developer submitted a measure with two costing approaches, the Committee determined that the costing approaches should be split into separate measures for any measure submitted for consideration that included both approaches. The developer (HealthPartners) agreed to split their measure and re-submitted two separate measures, one using actual prices paid and another using a standardized pricing approach. During the initial review of Ingenix measures, it was not immediately apparent to NQF staff nor the Committee that their submissions included two costing approaches. Once this was identified, Ingenix was notified and was provided the same options of splitting their measure as was given HealthPartners. Ingenix was asked to 1) split their measure submission into two measures, one with each costing approach, OR, 2) update the submitted measure to include only one costing approach. Ingenix chose to resubmit their measures with actual prices paid only. The Committee chose to provide a final vote on the measure once the developer selected a single pricing approach. Both measure developers were given the same option and thus our process was consistent across developers.

- *""As noted above, no part of these measures' original clinical logic, risk adjustment or other methodology was altered. These reversals were based entirely on the change in pricing approach requested by NQF itself. Our interpretation is that the change in endorsement recommendation is based on a preference by the Steering Committee for standard priced measures or having available both standard-priced and actual priced measures." (pg. 4)*

  Response: The Committee agreed that both approaches could be appropriate for different applications. However, the Committee's decision to recommend (or not recommend) individual measures should not be interpreted as driven by simply the measure's costing approach. A measure-by-measure decision was made on the appropriateness of the costing approach given other measure characteristics, resulting in the endorsement of both types of measures. Reliability and validity was examined through the interaction of the measure's specified level of measurement, risk adjustment model, and other measure characteristics. There was agreement that actual prices paid by health plans to individual clinicians is important to measure and report; for example, regional comparisons at the individual clinician level where environmental factors may not be as prominent, or nationally at higher levels of measurement (i.e., health plan level). The Committee did, however, express concern over applying an actual price approach for national comparisons at an individual clinician level. Specifically, the Committee noted the potential for misinterpreting clinician resource use in national reporting. This pricing approach includes environmental factors (i.e., local facility and wage index) that may be outside of an individual clinician's control. Further, the Committee noted that using measures of actual prices paid and standardized pricing together provides the most comprehensive picture of cost and resource use that can be used regionally and for national comparisons.

- *"Optum agrees with the Steering Committee that national comparisons of resource use have value in identifying differences in the practice of medicine across different areas, the development of best-practice benchmarks and highlighting opportunities for improvement. We also agree that standard pricing is more appropriate for such national comparisons. However, we also believe there is an important role for measures that use actual pricing because the large majority of physician measurement initiatives are undertaken at a local level." (pg. 4)*

  Response: The Committee's discussion of the use of actual prices was framed under the assumption that National Consensus Standards should be valid for use for national comparisons. This has been identified by NQF as a policy issue that should be discussed further by the CSAC and the BOD.

2. Steering Committee deliberations on selected components of the usability and feasibility criteria and their impact on final recommendations.

- *"Our interpretation is that the failure of these four measures is based primarily on the assessments by the Steering Committee around Feasibility and Usability." (pg. 5)*

  "In particular, there are four key points that warrant further consideration when assessing the Feasibility and Usability of the Optum measures:

  a.Measure complexity;
  b.Sample size and usefulness in measuring individual physicians;
  c.The impact of "carve-out" services (missing data) in measure application; and
  d.Cost of implementation."(pg. 5)

  Response: a) Within the usability criteria, the Committee did consider complexity as it relates to transparency. The Committee recognizes that resource use measures, including those derived from episode groupers are inherently complex. This complexity should not, however, hinder the transparency, clarity, and ability to deconstruct the measure for understanding. Further, the Committee chose to recommend measures based on individual measure characteristics, rather than disregarding any measure due to its inherent complexity. The Committee noted that the ETG and ERG risk adjuster are very complex and still passed endorsement in two measures.

  b) The issue of sample size was discussed in the context of scientific acceptability. The Committee was primarily concerned that the testing results provided by the measure developers did not sufficiently demonstrate reliability and validity at the individual provider level. In the instance of the Diabetes measure, the Committee requested that the measure developer provide required testing results, including calibration curves, risk-decile plots or goodness-of-fit statistics.

  c) The issue of carve outs were also discussed in the context of scientific acceptability. The Committee questioned the validity of measure results for certain types of episodes (e.g., asthma), where data has been carved out (e.g., pharmacy costs) would not

accurately reflect the cost of that episode if it lacked clear recognition these costs were missing. This issue is compounded when comparing among entities, some of whose measure results include all types of costs and others excluding carved out costs.

d) The Committee considered the cost of the Ingenix product (ETGs, ERGs, PEGs) in the feasibility criterion of the measure evaluation as indicated by the policy on endorsement of proprietary performance measures. This policy is not unique to resource use measures and is applied in the evaluation of proprietary quality measures with fees as well. While some users may find the cost of the episode grouper reasonable, the use of these measures does not inherently imply the measures are acceptable for endorsement. The issue of the cost of the measures submitted by Ingenix was weighted differently for various stakeholders represented in the Steering Committee. The Committee also weighed the potential burden these costs may carry if these measures were adopted for regional or national reporting programs requiring that organizations take on these costs to participate. The Committee agreed that while the issue of cost was taken into consideration, it was not a deciding factor in the recommendations for any of the measures.

As Co-Chairs of this Committee, we can attest that this group spent considerable time and energy evaluating and digesting the volumes of information provided by measure developers submitting to this project. While recognizing the tremendous need for measures of resource use and cost, we do not recommend these measures be considered as national consensus standards. We also strongly believe that this process was fair and the Committee has been responsive to concerns raised by various stakeholders throughout the process. Additional detailed information on the measures can be found in the draft report. We welcome specific questions or areas we can help provide further clarification.

NQF Resource Use Measure submission
For question S10 - Answer: Ingenix Risk Adjustment Method Example
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Cardiology, Medical Group A				
Condition and Severity Level	**Number of Episodes**	**Observed Cost per Episode**	**Peers Cost per Episode**	**Relative Cost of Care Ratio**
Dr Jones	**By Condition and Severity Level**			
CHF, Level 1	20	$1,116	$1,320	0.85
CHF, Level 2	16	$1,775	$2,234	0.79
CHF, Level 3	12	$2,977	$3,145	0.95
Dr Smith	**By Condition and Severity Level**			
CHF, Level 1	30	$1,520	$1,320	1.15
CHF, Level 3	12	$3,349	$3,145	1.06
Dr Jones	**By Condition**			
CHF	48	1,801	2,081	0.87
Dr Smith	**By Condition**			
CHF	42	2,043	1,841	1.11

Reliability Across HCOs

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: CAD

	ETG Base 386500 - CAD									
	Data Source									
Cardiology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	1,545	3,533	7,032	7,638	26,305	325	3,280	2,208	1,280	53,146
Cost per Episode	$ 3,035	$ 4,096	$ 3,874	$ 2,613	$ 4,242	$ 4,412	$ 4,726	$ 3,840	$ 6,813	$ 3,991
Primary Care Core Cost per Episode	$ 54	$ 82	$ 76	$ 73	$ 72	$ 117	$ 89	$ 70	$ 94	$ 75
Specialist Cost per Episode	$ 1,014	$ 879	$ 2,270	$ 700	$ 847	$ 818	$ 728	$ 699	$ 999	$ 1,011
ER Cost per Episode	$ 63	$ 50	$ 57	$ 33	$ 59	$ 48	$ 56	$ 43	$ 109	$ 55
Radiology Cost per Episode	$ 252	$ 267	$ 209	$ 191	$ 183	$ 384	$ 174	$ 279	$ 345	$ 204
RX Cost per Episode	$ 617	$ 788	$ 520	$ 610	$ 683	$ 745	$ 648	$ 480	$ 773	$ 648
Lab Cost per Episode	$ 60	$ 69	$ 158	$ 35	$ 19	$ 60	$ 35	$ 74	$ 122	$ 50
Hospital Cost per Episode	$ 976	$ 1,961	$ 585	$ 972	$ 2,379	$ 2,241	$ 2,996	$ 2,194	$ 4,372	$ 1,948

	ETG Base 386500 - CAD									
	Data Source									
Cardiology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	1,545	3,533	7,032	7,638	26,305	325	3,280	2,208	1,280	53,146
Specialist Visits per 1000 Episodes	3,066	2,902	3,162	2,846	3,633	2,731	3,751	2,385	2,696	3,320
Radiology Encounters per 1000 Episodes	685	535	480	551	586	452	725	621	545	575
Lab Encounters per 1000 Episodes	1,366	1,163	2,115	1,652	395	1,400	1,872	1,842	1,510	1,067
MRI Encounters per 1000 Episodes	6	3	1	2	5	39	2	3	4	4
ER Visits per 1000 Episodes	77	50	99	45	75	22	98	57	65	73
Inpatient Days per 1000 Episodes	212	266	54	205	419	228	691	414	263	335
Admissions per 1000 Episodes	69	98	19	63	142	101	231	194	120	116

	ETG Base 386500 - CAD									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	2,093	1,162	5,176	8,155	10,386	1,362	3,554	6,621	544	39,054
Cost per Episode	$ 2,158	$ 5,026	$ 4,957	$ 3,606	$ 4,234	$ 6,978	$ 3,738	$ 2,683	$ 2,423	$ 3,873
Primary Care Core Cost per Episode	$ 186	$ 102	$ 115	$ 103	$ 111	$ 207	$ 107	$ 174	$ 210	$ 129
Specialist Cost per Episode	$ 546	$ 874	$ 2,872	$ 792	$ 788	$ 1,038	$ 573	$ 448	$ 347	$ 980

ER Cost per Episode	$ 42	$ 99	$ 102	$ 70	$ 95	$ 222	$ 72	$ 42	$ 55	$ 81
Radiology Cost per Episode	$ 152	$ 239	$ 234	$ 154	$ 147	$ 309	$ 133	$ 194	$ 301	$ 177
RX Cost per Episode	$ 590	$ 758	$ 472	$ 624	$ 628	$ 695	$ 620	$ 455	$ 658	$ 581
Lab Cost per Episode	$ 31	$ 66	$ 213	$ 33	$ 19	$ 67	$ 34	$ 71	$ 63	$ 62
Hospital Cost per Episode	$ 611	$ 2,887	$ 950	$ 1,830	$ 2,445	$ 4,440	$ 2,199	$ 1,299	$ 788	$ 1,863

	ETG Base 386500 - CAD									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	2,093	1,162	5,176	8,155	10,386	1,362	3,554	6,621	544	39,054
Specialist Visits per 1000 Episodes	2,964	3,035	3,625	3,667	3,689	2,884	3,936	2,245	2,380	3,349
Radiology Encounters per 1000 Episodes	567	575	628	702	600	581	772	503	376	618
Lab Encounters per 1000 Episodes	1,074	1,303	2,084	1,779	419	1,671	2,103	2,095	1,416	1,480
MRI Encounters per 1000 Episodes	1	4	2	2	5	26	3	1	6	4
ER Visits per 1000 Episodes	58	85	187	99	118	126	141	91	73	116
Inpatient Days per 1000 Episodes	161	508	179	743	593	440	869	532	42	545
Admissions per 1000 Episodes	55	145	42	152	165	178	224	127	24	137

	ETG Base 386500 - CAD									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	3,054	2,925	5,021	11,499	38,992	639	2,782	8,067	1,794	74,773
Cost per Episode	$ 2,568	$ 4,465	$ 4,872	$ 3,400	$ 4,048	$ 6,930	$ 4,062	$ 3,250	$ 5,862	$ 3,942
Primary Care Core Cost per Episode	$ 189	$ 128	$ 105	$ 122	$ 142	$ 246	$ 139	$ 148	$ 130	$ 139
Specialist Cost per Episode	$ 667	$ 874	$ 2,873	$ 749	$ 748	$ 1,123	$ 608	$ 465	$ 814	$ 862
ER Cost per Episode	$ 49	$ 87	$ 106	$ 70	$ 67	$ 220	$ 80	$ 57	$ 94	$ 71
Radiology Cost per Episode	$ 190	$ 230	$ 232	$ 143	$ 140	$ 340	$ 144	$ 178	$ 341	$ 163
RX Cost per Episode	$ 600	$ 720	$ 503	$ 657	$ 645	$ 693	$ 605	$ 401	$ 734	$ 613
Lab Cost per Episode	$ 35	$ 66	$ 257	$ 36	$ 15	$ 88	$ 35	$ 79	$ 110	$ 48
Hospital Cost per Episode	$ 839	$ 2,360	$ 795	$ 1,622	$ 2,291	$ 4,219	$ 2,451	$ 1,922	$ 3,638	$ 2,046

	ETG Base 386500 - CAD									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	3,054	2,925	5,021	11,499	38,992	639	2,782	8,067	1,794	74,773
Specialist Visits per 1000 Episodes	3,412	3,139	4,066	3,771	3,940	3,500	4,304	2,304	2,587	3,670
Radiology Encounters per 1000 Episodes	688	594	642	667	611	678	839	603	519	630

Lab Encounters per 1000 Episodes	1,120	1,248	2,397	1,917	436	1,979	2,056	2,287	1,479	1,153
MRI Encounters per 1000 Episodes	2	5	2	2	4	20	1	2	4	3
ER Visits per 1000 Episodes	68	94	183	101	98	114	166	93	63	104
Inpatient Days per 1000 Episodes	241	390	190	687	692	529	1,097	751	230	636
Admissions per 1000 Episodes	74	127	45	142	162	183	228	280	103	160

Results Across Peer Groups, Cost

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: CAD

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Cardiology Peer Definition					
# of Episodes	31,546	17,241	2,771	1,589	53,146
Total Cost per Episode	$ 2,630	$ 4,012	$ 10,617	$ 19,237	$ 3,991
Primary Care Core Cost per Episode	$ 62	$ 84	$ 117	$ 148	$ 75
Specialty Care Cost per Episode	$ 697	$ 1,051	$ 2,520	$ 4,198	$ 1,011
ER Cost per Episode	$ 36	$ 54	$ 166	$ 238	$ 55
Radiology Cost per Episode	$ 197	$ 209	$ 221	$ 256	$ 204
Pharmacy Cost per Episode	$ 600	$ 687	$ 853	$ 823	$ 648
Laboratory Cost per Episode	$ 36	$ 53	$ 118	$ 184	$ 50
Hospital Services Cost per Episode	$ 1,002	$ 1,874	$ 6,621	$ 13,390	$ 1,948

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	21,704	13,372	2,478	1,501	39,054
Total Cost per Episode	$ 2,288	$ 3,510	$ 9,938	$ 20,036	$ 3,873
Primary Care Core Cost per Episode	$ 109	$ 138	$ 191	$ 230	$ 129
Specialty Care Cost per Episode	$ 557	$ 906	$ 2,661	$ 4,982	$ 980
ER Cost per Episode	$ 54	$ 77	$ 192	$ 326	$ 81
Radiology Cost per Episode	$ 166	$ 184	$ 200	$ 247	$ 177
Pharmacy Cost per Episode	$ 523	$ 620	$ 736	$ 818	$ 581
Laboratory Cost per Episode	$ 39	$ 60	$ 149	$ 265	$ 62
Hospital Services Cost per Episode	$ 840	$ 1,524	$ 5,809	$ 13,170	$ 1,863

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Internal Medicine Peer Definition					
# of Episodes	42,658	24,784	4,691	2,641	74,773
Total Cost per Episode	$ 2,276	$ 3,785	$ 10,533	$ 20,635	$ 3,942
Primary Care Core Cost per Episode	$ 119	$ 151	$ 198	$ 241	$ 139
Specialty Care Cost per Episode	$ 498	$ 884	$ 2,214	$ 4,134	$ 862
ER Cost per Episode	$ 48	$ 73	$ 157	$ 287	$ 71
Radiology Cost per Episode	$ 148	$ 173	$ 201	$ 235	$ 163
Pharmacy Cost per Episode	$ 553	$ 659	$ 787	$ 839	$ 613
Laboratory Cost per Episode	$ 31	$ 49	$ 111	$ 194	$ 48
Hospital Services Cost per Episode	$ 879	$ 1,795	$ 6,864	$ 14,705	$ 2,046

Results Across Peer Groups, Utils

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: CAD

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Cardiology Peer Definition					
# of Episodes	31,546	17,241	2,771	1,589	53,146
Specialist Visits per 1000 Episodes	2,592	3,582	6,476	9,421	3,320
Radiology Encounters per 1000 Episodes	464	612	1,048	1,544	575
Laboratory Encounters per 1000 Episodes	831	1,338	1,674	1,760	1,067
MRI Encounters per 1000 Episodes	4	3	3	10	4
ER Visits per 1000 Episodes	57	80	136	186	73
Admission Days per 1000 Episodes	122	320	1,311	3,031	335
Number of Admissions per 1000 Episodes	63	114	405	704	116
Number of Prescriptions per 1000 Episodes	7,257	8,611	9,300	9,676	7,875
Number of Generic Prescriptions per 1000 Episodes	4,541	5,557	5,825	5,854	4,977
	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	21,704	13,372	2,478	1,501	39,054
Specialist Visits per 1000 Episodes	2,347	3,420	6,812	11,494	3,349
Radiology Encounters per 1000 Episodes	451	633	1,230	1,883	618
Laboratory Encounters per 1000 Episodes	1,094	1,743	2,786	2,566	1,480
MRI Encounters per 1000 Episodes	3	4	3	8	4
ER Visits per 1000 Episodes	89	123	214	291	116
Admission Days per 1000 Episodes	173	533	1,827	3,929	545
Number of Admissions per 1000 Episodes	67	124	429	776	137
Number of Prescriptions per 1000 Episodes	7,082	8,809	9,213	10,244	7,930
Number of Generic Prescriptions per 1000 Episodes	4,606	5,896	6,210	6,508	5,222
	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total

Internal Medicine Peer Definition					
# of Episodes	42,658	24,784	4,691	2,641	74,773
Specialist Visits per 1000 Episodes	2,497	3,903	7,809	13,082	3,670
Radiology Encounters per 1000 Episodes	433	665	1,377	2,152	630
Laboratory Encounters per 1000 Episodes	848	1,423	2,019	2,008	1,153
MRI Encounters per 1000 Episodes	3	4	4	7	3
ER Visits per 1000 Episodes	77	116	193	276	104
Admission Days per 1000 Episodes	193	577	2,497	5,050	636
Number of Admissions per 1000 Episodes	74	164	507	890	160
Number of Prescriptions per 1000 Episodes	7,001	8,777	9,367	10,199	7,851
Number of Generic Prescriptions per 1000 Episodes	4,502	5,890	6,345	6,646	5,153

Exclusions

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: CAD

	Data Source									
	HCO: A	**HCO: B**	**HCO: C**	**HCO: D**	**HCO: E**	**HCO: F**	**HCO: G**	**HCO: H**	**HCO: J**	**Total**
% Complete Episodes	83.91%	82.15%	77.90%	84.51%	81.85%	82.11%	81.72%	83.15%	81.84%	82.47%
% Incomplete Episodes	16.09%	17.85%	22.10%	15.49%	18.15%	17.89%	18.28%	16.85%	18.16%	17.53%
% Non-Outliers Episodes	89.30%	89.48%	84.52%	88.91%	89.16%	87.13%	77.92%	87.64%	88.64%	87.86%
% Hi Outliers Episodes	2.72%	5.18%	10.33%	2.01%	3.57%	5.65%	2.29%	3.79%	4.31%	4.08%
% Lo Outliers Episodes	7.98%	5.34%	5.14%	9.08%	7.27%	7.22%	19.79%	8.57%	7.05%	8.07%
% Non-Outliers + Hi Outliers Episodes	92.02%	94.66%	94.86%	90.92%	92.73%	92.78%	80.21%	91.43%	92.95%	91.93%
% Episodes Eligible for Attribution	77.19%	77.57%	73.64%	76.84%	75.91%	76.19%	66.24%	76.06%	76.09%	75.81%

Notes:
Data is based on the analysis of 9 Health Care Organizations (HCO) totaling more than 48 million episodes
Episodes are defined as either Complete or Incomplete according to ETG Methodology. See response for SA3.1 for additional details on Episode completion
Episodes are defined as Outliers according to the ETG Trim Point Methodology. See response for SA3.1 for additional details on Outlier Episodes
Episodes Eligible for Attribution represents episodes that are Complete, Non-Outliers or Hi Outliers, applicable for a peer group based upon the episode ETG.

NATIONAL QUALITY FORUM

TO: Consensus Standards Approval Committee (CSAC)

FR: Taroon Amin, Senior Director
Ashlie Wilbon, Senior Project Manager
Evan Williamson, Project Analyst

RE: Clarification on the definition of a national consensus standard

DA: February 21, 2012

CSAC ACTION REQUIRED

The CSAC is asked to provide guidance on the definition of a national consensus standard.

BACKGROUND

During the resource use project, the Steering Committee spent considerable time discussing the appropriate application of cost and resource use measures using actual prices paid, or an approach that allows them to compare the use and intensity of health services while holding actual paid amounts constant (e.g., standardized prices).

Resource use measures that apply standardized prices allow for comparison of resource use units across or within regions and local markets, while actual prices allow for comparison of prices paid only within regions or local markets. The Committee agreed that both approaches could be appropriate for different applications. There was agreement that actual prices paid by health plans to individual clinicians is important to measure and report; for example, regional comparisons at the individual clinician level where environmental factors may not be as prominent. The Committee did, however, express concern over applying an actual price approach for national comparisons, particularly at an individual clinician level. Specifically, the Committee noted the potential for misinterpreting clinician resource use in national reporting. Measures using actual prices do not account for environmental factors (i.e., local facility and wage index) that may be outside of an individual clinician's control.

Throughout their deliberations, it was the Committee's interpretation that the definition of a national consensus standard is to allow fair and equitable comparisons of resource use across all entities regardless of geographic location. While the Committee did not make final recommendations based on a single measure component (i.e. costing approach), the Committee did consider whether valid conclusions about performance on resource use could be made considering a measure's cost approach, level of measurement, risk-adjustment model, clinical logic, and other measure characteristics. In fact, the Committee evaluated each of the measures individually against all of the criteria; a process that resulted in one endorsed measure and three measures pending CSAC vote which use an actual prices paid costing approach.

Measuring using actual prices paid – costing approach
Endorsed January 30, 2012

- (1604) Total Cost of Care Population-based PMPM Index (HealthPartners)

Pending CSAC Vote

- (1609) ETG based hip/knee replacement cost of care measure (Ingenix)
- (1611) ETG based pneumonia cost of care (Ingenix)
- (1595) ETG Based Diabetes Cost of Care (Ingenix) [Split Committee vote]

However, the Committee did express caution when evaluating measures that use actual prices paid costing approach for national comparisons of resource use at the individual clinician level. A measure that uses actual prices paid does not adjust for regional labor costs and practice costs (including hospital wage indexes and geographic practice cost indexes) that may be outside the control of an individual provider. This lack of adjustment raised concerns for many members of the Committee. Measures submitted by HealthPartners and NCQA can be applied down to the physician group level, while measures submitted by Ingenix can be applied down to the individual clinician level. Through this discussion, Committee questioned the definition of a national consensus standard since there are at least two interpretations highlighted in the resource use measures.

CLARIFICATION REQUESTED

The CSAC is asked to provide guidance on two potential definitions of a national consensus standard:

Interpretation 1: A national consensus standard requires a standardized approach that can be used to compare all accountable entities nationally, as well as, at the local/regional level.

If the CSAC agrees that interpretation 1 is correct, then the appropriateness of endorsing measures using actual prices, particularly at the individual clinician level could be questioned. Comparisons at a higher level measurement may be appropriate where the effect of geographic price variation is not as prominent; however, the CSAC should consider the appropriateness of actual prices paid at any level of measurement.

Interpretation 2: A national consensus standard allows for a national standard that can be used to compare accountable entities at only the local/regional level.

If the CSAC agrees that interpretation 2 is correct, additional clarifying information needs to be provided with the endorsement of measures which use actual prices. The following questions require further consideration:

- How is a region/market defined?
- How should these measures be "flagged" when fair comparisons and valid conclusions about performance can only be done at the local/regional level?
- Is it appropriate to endorse an actual price measure for national comparisons if it is paired with a standardized price measure?

The Committee recognized that measures using actual prices paid have been in widespread use by the purchaser and health plan communities for years in various applications. The Committee

is also cognoscente of the implications of these recommendations for measures that could be used for both accountability (i.e. public reporting) and performance improvement purposes for wider audiences. Thus, clarifying the definition of a national consensus standard is important particularly for this application.

NEXT STEPS

The CSAC is asked to consider this issue and provide guidance to the Board of Directors.

Taroon Amin

From: David Hopkins <DHopkins@pbgh.org>
Sent: Monday, February 13, 2012 9:20 PM
To: Helen Burstin; Timothy Ferris, MD, Mphil, MPH
Cc: Jennifer Eames Huff
Subject: CSAC review of Cost and Resource Use measures

Helen and Tim –

Would you please share this information with the subcommittee that will be reviewing the appeal by Optum on the 3 measures that were voted down by the Cost and Resource Use Steering Committee?

Thanks.

David

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From: Helen Burstin [mailto:hburstin@qualityforum.org]
Sent: Wednesday, November 23, 2011 11:26 AM
To: David Hopkins
Cc: Ann Monroe ; Timothy Ferris, MD, Mphil, MPH; William Kramer; Debra Ness; Janet Corrigan; Taroon Amin; Ashlie Wilbon
Subject: RE: CSAC issues

Dear David,

Here are detailed responses to the specific issues you raised in your prior email on the resource use project.

1. *Evolving principles and criteria that are being proposed by a committee that, in our view, was never constituted properly to serve this purpose.*

   The Committee was constituted for two phases, anticipated foundational work in the first year and then review of measure submissions in the second year. The attached Call for Nominations for the Steering Committee highlights that the committee would be providing guidance on the application of NQF evaluation criteria to resource use measures and identifying if changes were needed in the evaluation criteria. Additionally, at the end of the second phase of reviews, the Steering Committee was asked to provide guidance on future efforts related to this area of measurement.

   DH Response: The issue we raised was with the make-up of a committee to decide on matters of such great importance to purchasers that was populated with a majority (12/23) of provider representatives and only 3 purchaser and plan representatives combined. Can NQF not turn down nominations based on need for a balanced steering committee?

2. *Interestingly, many of these principles would appear to be relevant for quality measures as well but are proposed only for application to cost and resource use measures. Thus, we would suggest that the development of such principles is the purview of the CSAC and its duly appointed task forces and should be elevated to the CSAC at this time*

   In November 2010, the CSAC reviewed, discussed, and approved the proposed criteria for resource use measures. At the in-person meeting, the CSAC reviewed the resource use criteria that were grounded in the current NQF Evaluation Criteria and only expanded on explanatory language or sub-criteria in order to accommodate resource use measures (CSAC materials attached). The CSAC voted to approve the criteria for use in phase two of the project. The principles for Resource Use Measure evaluation were proposed in the Resource Use White Paper that was shared with the CSAC in advance of the November 2010 for input and comment. The principles were also included in both draft reports for comment. A member of the CSAC, Barbara Rudolph, was a member of the Steering Committee.

   DH Response: We stand corrected!

3. *Each of the TAPs should have included at least one member who is a technical expert and represents a current health plan user of the measures under consideration. This is of particular concern with respect to the Cardiovascular/Diabetes and Pulmonary TAPs that included no such representation. Without the expert knowledge of such users, the TAPs have a tendency to dwell on scientific precision rather than balancing the need for absolute precision with the need for sufficiently reliable information on cost and resource use to achieve the purposes of the Triple Aim.*

   In the Call for Nominations we sought to include technical experts on each of the TAPs and the SC. It was challenging to empanel committee members from health plans who didn't have financial interest in a particular measurement system. As per NQF policy, all slates were posted for public and member comment. NQF received one comment regarding a potential conflict of interest and that individual was removed from the slate. Four additional comments were received in gap areas (rheumatologic expertise, cardiology expertise, nursing expertise, and the small practice perspective). As a result of the comments, two additional members were included on the steering committee. NQF did not receive any comments suggesting additional health plan representation on the TAPs. It is also important to remember that the TAPs do not make any recommendations on the endorsement criteria or the overall recommendation to endorse decision. The primary role of the TAPs was to help the SC evaluate the underlying clinical logic and the scientific acceptability of each of the measures; not to provide an ultimate recommendation of endorsement. The Steering Committee is the decision-making body on the recommendation to approve measures and it had health plan, consumer, and purchaser members.

   DH Response: Clearly, the work of the TAPs has a significant influence on decisions by the Steering Committees. We understand that you do extensive outreach and can only accept TAP members who agree to serve. But, in this instance, it is difficult for us to understand why you couldn't draw folks from plans or providers that actually use these measures (and are not conflicted) to serve on each of the TAPs. Surely, AHIP could have helped?

4. *Early in its process, the Steering Committee required the measure developers to unbundle their actual vs. standardized cost measures and permit them to submit either one or the other. These measures are used together in the "real world" so as to enable one to differentiate variation in utilization from variation in pricing, both of which are essential to understand and improve efficiency. What is the point of having only one measure in a pair endorsed when the other was not even considered?*

   This is incorrect. Developers were asked to unbundle their measures but they were NOT told they could only submit one or the other. They were encouraged to submit BOTH.

For use as a national consensus standard, measure results should unambiguously reflect differences in performance for an accountable entity, not differences in the type of data that an entity choses to submit (actual prices or standardized prices). As such, developers that allowed for user flexibility in the costing approach were asked to split their measures into two separate measures where only one approach is specified in a single measure. Developers had the option of submitting multiple measures (i.e., one using actual prices and another using standardized prices). Health Partners elected to split their measure; and submitted both for consideration. Ingenix chose to submit one measure using actual prices paid. Ingenix told NQF staff that they were not willing to publicly share their standardized pricing information. On the initial combined measure submission, Ingenix also did not provide explanatory information on the standardized pricing approach required to fully evaluate the measure.

DH Response: Understood. We were just suggesting that the SC might have made it a requirement to submit both instead of an option.

5. *The final Steering Committee Cycle 2 voting process appears to be flawed. Many measures were rejected by a narrow margin that was determined without a full vote count. In most of these cases, the TAP's evaluation was suggestive of a positive recommendation, so one must conclude that those Steering Committee members who voted against endorsement were reflecting their own judgments and biases in their votes. One would assume that the Steering Committees would be held to the same requirements as the CSAC when it comes to voting on a measure, namely that every member is required to vote and anyone voting to reject a measure must explain their reasoning. Otherwise, the CSAC has limited information on which to base its own votes. Therefore, we would ask that when the Steering Committee is reconvened to consider public comments the members be required to vote on the full set of measures, including those not recommended in the Cycle 2 report, in this way.*

   The Steering Committee had lengthy discussions about the measures in public session with full votes and all transcripts are available. As noted above, TAPs provide technical expertise on the NQF evaluation **sub-criteria**. TAPs do not evaluate measures at the level of the individual criteria and they do not provide overall recommendations as to whether a measure should be endorsed. Steering Committees consider the TAP input on the sub-criteria, but their responsibilities are much broader -- they vote on the **criteria and the overall recommendation**. According to NQF's process, the authority to decide whether a measure should or should not be recommended for endorsement rests with the Steering Committee. TAPs are not constituted or charged with making judgments about whether measures should be endorsed.

   The public commenting period for the Cycle 2 Draft Report ended on Monday. The SC will evaluate all of the comments received by the public and membership. If the Committee determines that their votes should be revisited, they can decide that at that time. On the issue of personal bias in the votes, each member brings their own viewpoints and must exercise judgment. All Steering Committee members were vetted for conflict of interest and as noted above, the proposed slates were posted for public comment. We received no comments expressing concerns about any proposed committee members.

   DH Response: If you examine the voting record of this particular Steering Committee, I think you will find that all or nearly all of the negative votes on the measures turned down came from the provider reps and that the purchaser, plan, and consumer reps either didn't vote or voted the other way. Please tell me if I'm wrong, but this is why we feel so strongly that the CSAC, which provides a much more balanced perspective, needs to get involved and review both the process and the substantive issues relating to these measures. We are pleased, therefore, with the decision to have a small committee review the matter for more in-depth discussion by the full CSAC.

We'd be happy to provide any additional information/clarification.

Best wishes for the holiday.
-Helen

From: David Hopkins [mailto:DHopkins@pbgh.org]
Sent: Friday, November 18, 2011 12:11 PM
To: Helen Burstin
Cc: Ann Monroe ; Timothy Ferris, MD, Mphil, MPH; William Kramer; Debra Ness; Janet Corrigan
Subject: RE: CSAC issues

Thank you, Helen. I apologize for causing extra work for you and the staff, but I know you understand the importance of the resource use area to the purchaser and consumer communities and we do appreciate your efforts to review the process and make sure that it isn't resulting in setting higher standards for resource use measures than for other kinds of quality measures.

Best,

David

From: Helen Burstin [mailto:hburstin@qualityforum.org]
Sent: Friday, November 18, 2011 4:01 AM
To: David Hopkins
Cc: Ann Monroe ; Timothy Ferris, MD, Mphil, MPH; William Kramer; Debra Ness; Janet Corrigan
Subject: RE: CSAC issues

Dear David,

Thanks for your email.

We have already removed Usability from the Board agenda. We do not have consensus among the Usability Task Force and the CSAC. The CSAC will have another opportunity to discuss the updated draft that is being reviewed by the task force before it is brought to the Board for approval.

With respect to the Cost and Resource Use Project, you raise a number of important issues regarding the process and deliberations of the committee. Some of your assertions are not accurate. We're working on a detailed response that will include information from each step of the project. We'll send it along early next week.

Best,
Helen

From: David Hopkins [mailto:DHopkins@pbgh.org]
Sent: Wednesday, November 16, 2011 1:48 PM
To: Helen Burstin
Cc: Ann Monroe ; Timothy Ferris, MD, Mphil, MPH; William Kramer; Debra Ness
Subject: CSAC issues

Hi Helen –

As you know, two topics that are subject to ongoing discussion/resolution by CSAC and the Board are of paramount interest to purchasers and consumers, namely the refinement of the NQF Usability criterion and the evolving new principles being proposed by the Cost and Resource Use Steering Committee. I'm writing, therefore, to ask for your clarification of the process that will be followed with respect to these two projects.

With respect to Usability, since this is one of the four major categories of criteria for measure endorsement and is of critical importance to endorsement of high-value measures that will truly make a difference, we believe it deserves more thought and discussion before it is put before the Board. I recall that we discussed the draft report in a relatively brief time slot at our November meeting, and several suggestions were made at that time. In particular, questions were raised about the extremely permissive proposal regarding the time for adoption of an NQF-endorsed measure in any accountability program, and suggestions were made for how this could be shortened or even eliminated if a measure developer were to be required to team with a user for accountability purposes at the time of measure submission. My concern is that, according to the official project time line, the Task Force's report and recommendations will be voted upon at the Dec. 2 Board meeting with no further review by the CSAC. We are requesting, therefore, that this deadline be extended to permit ample time for CSAC review, discussion, and final recommendations to the Board.

With respect to the Cost and Resource Use Steering Committee, there is a strong reaction from the purchaser community regarding the evolving principles and criteria that are being proposed by a committee that, in our view, was never constituted properly to serve this purpose. Interestingly, many of these principles would appear to be relevant for quality measures as well but are proposed only for application to cost and resource use measures. Thus, we would suggest that the development of such principles is the purview of the CSAC and its duly appointed task forces and should be elevated to the CSAC at this time. We are further reacting to what appear to be serious structural and process issues in relation to the Steering Committee's actions to date, namely:

1. Each of the TAPs should have included at least one member who is a technical expert and represents a current health plan user of the measures under consideration. This is of particular concern with respect to the Cardiovascular/Diabetes and Pulmonary TAPs that included no such representation. Without the expert knowledge of such users, the TAPs have a tendency to dwell on scientific precision rather than balancing the need for absolute precision with the need for sufficiently reliable information on cost and resource use to achieve the purposes of the Triple Aim.
2. Early in its process, the Steering Committee required the measure developers to unbundle their actual vs. standardized cost measures and permit them to submit either one or the other. These measures are used together in the "real world" so as to enable one to differentiate variation in utilization from variation in pricing, both of which are essential to understand and improve efficiency. What is the point of having only one measure in a pair endorsed when the other was not even considered?
3. The final Steering Committee Cycle 2 voting process appears to be flawed. Many measures were rejected by a narrow margin that was determined without a full vote count. In most of these cases, the TAP's evaluation was suggestive of a positive recommendation, so one must conclude that those Steering Committee members who voted against endorsement were reflecting their own judgments and biases in their votes. One would assume that the Steering Committees would be held to the same requirements as the CSAC when it comes to voting on a measure, namely that every member is required to vote and anyone voting to reject a measure must explain their reasoning. Otherwise, the CSAC has limited information on which to base its own votes. Therefore, we would ask that when the Steering Committee is reconvened to consider public comments the members be required to vote on the full set of measures, including those not recommended in the Cycle 2 report, in this way.

Look forward to getting your reaction to our requests.

Thanks.

David

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NATIONAL QUALITY FORUM

Resource Use Measure Evaluation 1.0
January 2011

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

Resource Use Definition:

- Resource use measures are broadly applicable and comparable measures of input counts—(in terms of units or dollars)-- applied to a population or population sample
- Resource use measures count the frequency of specific resources; these resource units may be monetized, as appropriate.
- The approach to monetizing resource use varies and often depends on the perspective of the measurer and those being measured. Monetizing resource use allows for the aggregation across resources.

NQF Staff: NQF staff will complete a preliminary review of the measure to ensure conditions are met and the form has been completed according to the developer's intent. Staff comments have been highlighted in green.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas)*.

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the subcriteria are met (TAP or Steering Committee)
High (H) – based on the information submitted, there is high confidence (or certainty) that the criterion is met
Moderate (M) – based on the information submitted, there is moderate confidence (or certainty) that the criterion is met
Low (L) - based on the information submitted, there is low confidence (or certainty) that the criterion is met
Insufficient (I) – there is insufficient information submitted to evaluate whether the criterion is met, e.g., blank, incomplete, or information is not relevant, responsive, or specific to the particular question (unacceptable)
Not Applicable (NA) - Not applicable (only an option for a few subcriteria as indicated)

Evaluation ratings of whether the measure met the overall criterion (Steering Committee)
Yes (Y)- The overall criteria has been met
No (N)-The overall criterion has NOT been met
High (H) – There is high confidence (or certainty) that the criterion is met
Moderate (M) – There is moderate confidence (or certainty) that the criterion is met
Low (L) - There is low confidence (or certainty) that the criterion is met

Recommendations for endorsement (Steering Committee)
Yes (Y) – The measure should be recommended for endorsement
No (N)-The measure should NOT be recommended for endorsement
Abstain (A)- Abstain from voting to recommend the measure

TAP/Workgroup Reviewer Name:
Steering Committee Reviewer Name:
Staff Reviewer Name(s):
NQF Review #: 1591 **NQF Project:** Endorsing Resource Use Standards- Phase II

BRIEF MEASURE INFORMATION
Measure Title: ETG Based Congestive Heart Failure (CHF) resource use measure
Measure Steward (IP Owner): Ingenix, 950 Winter Street, suite 3800, Waltham, Massachusetts, 02451
Brief description of measure: The measure focuses on resources used to deliver episodes of care for patients with Congestive Heart Failure (CHF). CHF episodes are defined using the Episode Treatment Groups (ETG) methodology and describe the unique presence of the condition for a patient and the services involved in diagnosing, managing and treating CHF. A number of resource use measures are defined for CHF episodes, including overall cost of care, cost of care by type of service, and the utilization of specific types of services. Each resource use measure is expressed as a cost or a utilization count per episode and comparisons with internal and external benchmarks are made using risk adjustment to support valid comparisons. As requested by NQF, the focus of this submission is for CHF episodes and will cover both measures at the CHF base and severity level and also a CHF composite measure where CHF episode results are combined across CHF severity levels. At the most detailed level, the measure is defined as the base condition of CHF and an assigned level of severity (e.g., resources per episode for CHF, severity level 1 episodes). Composite measures can then be created using these measurement units to meet a specific need. For example, a composite measure for CHF is derived by combining CHF episode results across CHF severity levels. Appropriate risk adjustment is applied to support comparisons (e.g., for physician measurement, adjusting for a physician's mix of CHF episodes by severity level when supporting a CHF composite comparison). The focus of this measure is on CHF. However, CHF episode results could also be included in a "cardiology", "chronic care", or other clinical composite for a physician, combining episodes in clinical areas similar to CHF. Further, an "overall" composite for a physician can be created, again by aggregating episode results across appropriate conditions and severity levels and applying proper risk adjustment when making comparisons.
Resource use service categories: Inpatient services: Inpatient facility services Inpatient services: Admissions/discharges Ambulatory services: Outpatient facility services Ambulatory services: Emergency Department Ambulatory services: Pharmacy Ambulatory services: Evaluation and management Ambulatory services: Procedures and surgeries Ambulatory services: Imaging and diagnostic Ambulatory services: Lab services
Brief description of measure clinical logic: This measure identifies patients with CHF and creates CHF episodes of care using the ETG methodology described in the ETG Construction Logic attached in our response to S.2. Each episode of CHF is characterized by an ETG Base class ID that specifies the type of condition; the ETG Base class ID representing CHF is 386800. An episode of CHF will contain all clinically relevant information related to the condition. In addition to this information, certain diagnoses are considered co-morbidities or condition status factors for CHF. For example, Rheumatic Heart Failure is a condition status factor and Diabetes is a comorbidity for CHF. Each episode is assigned a severity level based on age, gender and the observed comorbidity and condition status factors. The severity level is an indicator of the relative resources expected to be required for the given episode of CHF. The CHF episode clinical framework is defined by the services, or claim lines, that can begin an episode, the primary and incidental diagnosis relationships involved, how records group to an episode, including relative strength of relationship, and the severity logic employed.
If included in a composite or paired with another measure, please identify composite or paired measure:
Subject/ Topic Areas: Cardiovascular

Type of resource use measure: Per episode
Data Type: Administrative claims Other

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. Measure Steward Agreement. ***The measure is in the public domain or an intellectual property (measure steward agreement) is signed. Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*** **A.1.Do you attest that the measure steward holds intellectual property rights to the measure? (If no, do not submit)** Yes **A.2. Please check if either of the following apply:** Proprietary measure **A.3. Measure Steward Agreement.** Agreement signed and submitted **A.4. Measure Steward Agreement attached:** NQF Resource Use Addendum FINAL-634362976472675734.pdf	**A** **Y☐** **N☐**
B. Maintenance. ***The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. (If no, do not submit)*** Yes, information provided in contact section	**B** **Y☐** **N☐**
C. Purpose/ Use *(All the purposes and/or uses for which the measure is specified and tested:* Payment Program Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations)	**C** **Y☐** **N☐**
D. Testing. ***The measure is fully specified and tested for reliability and validity (See guidance on measure testing).*** Yes, reliability and validity testing completed	**D** **Y☐** **N☐**
E. Harmonization and Competing Measures. ***Have NQF-endorsed measures been reviewed to identify if there are related or competing measures? (List the NQF # and title in the section on related and competing measures)*** Yes ***E.1.*Do you attest that measure harmonization issues with related measure (either the same measure**	**E** **Y☐** **N☐**

focus or the same target population) have been considered and addresses as appropriate? (List the NQF # and title in the section on related and competing measures) Yes *E.2.Do you attest that competing measures (both the same measure focus and the same target population) have been considered and addressed where appropriate?* Yes	
F. Submission Complete. ***The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.***	**F** **Y☐** **N☐**
Have all conditions for consideration been met? **Staff Notes to Steward** (*if submission returned*)**:**	**Y ☐** **N ☐**
Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**	
File Attachments Related to Measure/Criteria: Attachment: ETG Construction Logic CHF.doc Attachment: S5_CHF_DataDictionary.xls Attachment: S5_CHF_DataDictionary-634387118359796412.xls Attachment: S6_DataProtocol.xls Attachment: S7.2_Data Source Reference.xls Attachment: S8_CHF_ClinicalLogic.xls Attachment: Attachment: S9.7_RU_Categories-634387122122164241.xls Attachment: S10_Risk Adjustment Method Example-634387295828307122.xls S12_sample_score_report_EPI-634387296021589609.pdf Attachment: SA_Reliability_Validity Testing_CHF.xls	

IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in performance. **Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All subcriteria must be met to pass this criterion.**	**Eval Rating**
High Impact **IM1. Demonstrated high impact aspect of healthcare:** Affects large numbers A leading cause of morbidity/mortality High resource use **IM1.1. Summary of evidence of high impact:** Around 5.8 million people in the United States have heart failure. About 670,000 people are diagnosed with it each year1. About one in five people who have heart failure die within one year from diagnosis1. Heart failure was a contributing cause of 282,754 deaths in 20061. The most common causes of heart failure are coronary artery disease, high blood pressure, and diabetes. Early diagnosis and treatment can improve quality of life and life expectancy for people who have heart failure. Treatment usually involves taking medicines, reducing salt in the diet, and getting daily physical activity. Analyses of Ingenix healthcare benchmark data for a large population of individuals can support an understanding of the	**1a** **H☐** **M☐** **L☐** **I☐**

importance of CHF and the measurement of resource use. Using a 12-month sample population of more than 7 million individuals (primarily non-elderly) from 9 health care organizations, patients with CHF were identified using diagnosis codes assigned to medical administrative claim records. The percentage of costs for these patients related to CHF and other conditions was also estimated using ETG grouped data for the identified CHF patients. Using this benchmark data, 0.5% of the total population was identified as having CHF. Total cost per member per month for these individuals was $4,229. Approximately 34% of the total costs for the members identified with CHF was identified as being related to CHF (based on total costs grouped to those condition episodes for those patients).
Analyses of the Ingenix healthcare benchmark data described above for episodes attributed to internal medicine physicians can further support an understanding of the relative financial importance of resource use measures for the condition. As shown below, across all physician episodes, the average total cost per episode is more than $4,000. Specialty and Hospital Services comprise the largest component of costs for these episodes.

CHF
# of Episodes 16,870

Cost per Episode:

Total Cost per Episode	$4,062
Primary Care Core Cost per Episode	$130
Specialty Care Cost per Episode	$1,020
ER Cost per Episode	$86
Radiology Cost per Episode	$54
Pharmacy Cost per Episode	$176
Laboratory Cost per Episode	$86
Hospital Services Cost per Episode	$2,509

Utilization per 1,000 Episodes:

Specialist Visits per 1000 Episodes	4,934
Radiology Encounters per 1000 Episodes	940
Laboratory Encounters per 1000 Episodes	1,751
ER Visits per 1000 Episodes	119
Admission Days per 1000 Episodes	1,885
Number of Admissions per 1000 Episodes	250
Number of Prescriptions per 1000 Episodes	6,493

IM1.2. Citations for evidence of high impact cited in IM1.1.:

1Lloyd-Jones D, Adams RJ, Brown TM, et al. Heart Disease and Stroke Statistics—2010 Update. A Report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee.* Circulation. 2010;121:e1-e170.
2 Centers for Disease Control and Prevention. Heart failure fact sheet: national estimates and general information on heart failure in the United States, 2010. Atlanta, GA [Internet]: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. Available at http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_failure.htm. Accessed on February 1, 2011.

IM2. Opportunity for Improvement

IM2.1. Briefly explain the benefits envisioned by use of this measure:

1b

Benefits envisioned by this set of measures relates to identifying opportunities and measuring value. In particular, the measure and its components can support:
--The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and
--Measurement of the value delivered by individual providers, provider groups, and delivery systems – in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.

H☐ M☐ L☐ I☐

IM2.2. Summary of data demonstrating variation across providers or entities:

The variation in resource use across providers can be demonstrated using actual measures of physician performance for the condition episodes.

Data to explore this question were extracted from the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used for this analysis was primarily for commercial non-elderly individuals and covered the years 2009 thru 2010. In particular, data for 9 health care organizations including 7 million members were selected. The information was processed to produce CHF episodes. Incomplete and low cost outlier episodes were excluded. High cost outlier episodes were truncated at the high outlier threshold level. Episodes were attributed to providers in relevant specialties (peer groups).

The observed and expected costs for CHF episodes were computed, with expected costs based on averages for a provider's peers, adjusted to reflect the providers mix of CHF episodes by severity level. In particular, the following steps were performed:
--Computed the observed experience for the provider being measured, across all episodes to be included in the comparison;
--Computed the experience for the provider's peers. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peer benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed.;
--Compared the observed experience to the expected result. This expected result is based on the peers average level of performance, adjusted to reflect the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio (O/E ratio) and is a risk adjusted measure. A ratio above 1.00 indicates greater resource use than peers, less than 1.00 lower resource use.

Variation in the O/E ratio across providers was assessed. In this way comparisons or relative resource use can be made, removing differences in the underlying mix of episodes included. Providers with greater than 20 CHF episodes were selected. For CHF, 107 providers and 3,000 episodes were included covering the specialties of internal medicine, family practice and cardiology. The providers in each specialty were compared with their peers only (same specialty and same enrolled population for the healthcare organization). However, OE results were aggregated across healthcare organizations and specialties to summarize variation.

The observed variation in cost of care performance can be summarized using the inter-quartile range for the O/E ratio (the difference between the 25th and 75th percentile physician OE ratios). The results showed variation in performance across these measure physicians. In particular, the inter-quartile range for the O/E ration for the following key measures was approximately: (e.g., 0.60 can be interpreted as 40 percent below peers, 1.40 as 40 percent above peers)

- Total Cost per Episode – 0.60 to 1.36
- Hospital Admissions per Episode – 0.52 to 1.38
- Specialty Care Cost per Episode – 0.52 to 1.38
- Pharmacy Prescriptions per Episode – 0.74 to 1.22

As shown, the variation observed across providers is significant.

IM2.3. Citations for data on variation:

Variations in per capita spending - Inpatient-based and specialist-oriented pattern of practice
Regional differences in Medicare spending are largely explained by the more inpatient-based and specialist-oriented pattern of practice observed in high-spending regions. Neither quality of care nor access to care appear to be better for Medicare enrollees in higher-spending regions.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care. Ann Intern Med . 2003 138(4): 273-287.
The Dartmouth Atlas shows a more than two-fold variation in per capita Medicare spending in different regions of the country. Adjusting for price differences leads to only a modest decline in overall variations. It is utilization -- the amount of care delivered to patients -- that explains most of the regional variation in Medicare spending. Most spending variation was due to differences in use of the hospital as a site of care (versus, say, hospice, nursing home, or the doctor's

office) and to discretionary specialist visits and tests.

Reflections on variations, The Dartmouth Atlas Of Health Care. Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=1338. Accessed on February 12, 2011.

Variations in clinical decision making – ambulatory care-sensitive conditions
Clinicians have identified a group of diagnoses referred to as "ambulatory care-sensitive" conditions – such as poorly controlled diabetes or worsening heart failure – which can be treated in either the inpatient or the outpatient setting, and for which hospitalization can often be prevented by better outpatient management. The variations among regions in admission rates of patients with these conditions can be ascribed to differences in clinical decision-making, rather than to differences in underlying illness rates. Hospitalization rates for these – and for most medical conditions – are also highly correlated with the local supply of hospital beds.
Hospital Discharges for Ambulatory Care-Sensitive Conditions Per 1,000 Medicare Enrollees, By Gender And Type Of Admission, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=20 Accessed on February 12, 2011.

Variations in the use of diagnostic tests and discretionary services
Variations in ECG ordering are not explained by patient characteristics. The tremendous nonclinical variations in ECG test ordering suggest a need for greater consensus about use of screening ECGs in primary care.
Randall SS, Bismruta M. Variation in routine electrocardiogram use in academic primary care practice. Arch Intern Med. 2001;161:2351-2355
Physicians in high-spending regions see patients back more frequently and are more likely to recommend screening tests of unproven benefit and discretionary interventions compared with physicians in low-spending regions; however, both appear equally likely to recommend guideline-supported interventions.

Physicians in higher-spending regions were much more likely than those in lower-spending regions to recommend discretionary services, such as referral to a subspecialist for typical gastroesophageal reflux or stable angina or, in another vignette, hospital admission for an 85-year-old patient with an exacerbation of end-stage congestive heart failure. And they were three times as likely to admit the latter patient directly to an intensive care unit and 30% less likely to discuss palliative care with the patient and family. Differences in the propensity to intervene in such gray areas of decision making were highly correlated with regional differences in per capita spending.

Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary decision making by primary care physicians and the cost of U.S. health care. Health Aff (Milwood), 2008; 27:813-823
Widely varying levels of health care spending across the United States are strongly correlated with the tendency of local physicians to recommend discretionary interventions. Physicians in regions of differing spending appear to differ only in their discretionary decision making. For decisions that are informed by evidence or practice guidelines (such as screening mammography and standard exercise tolerance testing), physicians were equally likely to recommend interventions regardless of local spending levels
Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary Decision Making By Primary Care Physicians And The Cost Of U.S. Health Care. Health Aff (Millwood). 2008; 27(3): 813–823.
Supply sensitive care
Supply-sensitive care accounts for more than half of all Medicare spending. In regions where there are more hospital beds per capita, patients will be more likely to be admitted to the hospital. In regions where there are more intensive care unit beds, more patients will be cared for in the ICU. More specialists will result in more visits to specialists. And the more CT scanners are available, the more CT scans patients will receive. The Dartmouth Atlas has consistently demonstrated these relationships.

Patients do not experience improved survival or better quality of life if they live in regions with more care. In fact, the care they receive appears to be worse. They report being less satisfied with their care than patients in regions that spend less, and having more trouble getting in to see their physicians.

Supply sensitive care, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=2937 Accessed on February 14, 2011.
Numerous studies have found that higher bed supply is associated with more hospital use for conditions where outpatient care is a viable alternative. This includes most medical causes of hospitalization. In 2006, bed supply remained an important determinant of medical discharges.
The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care.

Annals of Internal Medicine. Feb 18 2003;138(4):273-287.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care. Annals of Internal Medicine. Feb 18 2003;138(4):288-298.
By far, the most significant factor associated with how much Medicare spends in any given region is the availability of medical resources. Studies from the Dartmouth Atlas Project have shown that the frequency with which physicians admit patients with chronic diseases to the hospital is highly correlated
with the number of beds per capita in the region. The frequency of visits to medical specialists is correlated with the number of specialists available. And the frequency with which chronically ill patients undergo many diagnostic tests and procedures also varies. We call such procedures and tests, along with the rates of hospitalization and physician visits, "supply-sensitive" care, or care that varies with the local availability of such medical resources as physicians, hospital beds, intensive care unit (ICU) beds, and diagnostic imaging equipment. The volume of supply-sensitive care that is delivered to the chronically ill is a powerful force driving Medicare spending. The utilization of supply-sensitive services for treating the chronically ill varies dramatically across different regions of the country, and it is responsible for much of Medicare spending. Local capacity, or the local supply of medical resources per capita, varies widely, and this local capacity bears directly on how much care is used to treat the chronically ill.

Wennberg JE, Fisher ES, Goodman DC, Skinner JS. "Tracking the care of patients with severe chronic illness." The Dartmouth Atlas of Health Care 2008. Available at:
http://www.dartmouthatlas.org/downloads/atlases/2008_Chronic_Care_Atlas.pdf Accessed on February 14, 2011.

IM2.4. Summary of data on disparities by population group:

Health disparities are defined as differences in the occurrence, frequency, death and burden of diseases and other unfavorable health conditions that exist among specific population groups1. Examining health care differences or gaps experienced by one population compared to another is an integral part of understanding and improving health care quality2. The quality of healthcare delivered within the United States also differs from population to population due to differences in access to care, healthcare utilization and other factors2.

Measures of healthcare utilization allow for a broader understanding of access to care2. Barriers to care that are associated with differences in healthcare utilization may have a more significant impact on healthcare quality than other factors2. Several studies on disparities have relied upon measures of healthcare utilization and the data demonstrates some of the most significant differences in care among diverse groups2. Current efforts to improve healthcare delivery continue to rely upon measures of health care utilization to fully understand the complexities surrounding disparate health care outcomes. For example, greater utilization of services does not necessarily indicate better care. In fact, high use of some inpatient services may reflect compromised access to outpatient health services2.

In 2006, the Nation's 14 million health service workers provided approximately 960 million office visits, 673 million hospital outpatient visits, treated 37 million hospitalized patients and 1.4 million nursing home residents2. Approximately 70% of the non-institutionalized civilian population visited a provider's medical office or outpatient facility and about 60% received a prescription medication2. National health expenditures totaled over $2 trillion dollars in fiscal year 2006 with 5% of the population accounting for 55% of total costs2. Additionally, almost one-third of all healthcare expenditures are estimated to be the result of low-quality care, including overuse, misuse and waste2. Utilization resource measures provide a mechanism to better understand healthcare delivery patterns in order to improve the health of all population groups.

The cost and use measures included in this submission will provide an approach to assessing disparities. For example, episode-based measures of cost and use can be employed to create severity-adjusted comparisons of the resources expended in treating cardiovascular conditions, including supporting a focus on the condition-related resources.

IM2.5. Citations for data on disparities cited in IM2.4:

1. Health Disparities in the United States: Facts and Figures, American Society of Clinical Oncology, 2009
2. National Healthcare Disparities Report, U.S. Department of Health & Human Services, Agency for Healthcare Research and Quality, 2008

IM3. Measure Intent **1c**

IM3.1. Describe intent of the measure and its components/ Rationale (including any citations) for **H☐**

analyzing variation in resource use in this way As noted in IM2.1, the intent of the measure and its components is to support: -- The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and -- Measurement of the value delivered by individual providers, provider groups, and delivery systems – in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.	**M☐** **L☐** **I☐**
IM4. Resource use service categories are consistent with measure construct *Refer to IM3.1. & all S9 items to evaluate this criteria.*	**1d** **H☐** **M☐** **L☐** **I☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report*?	
Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, met? **Rationale:**	**Y☐** **N☐**

SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES	
Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented.	
MEASURE SPECIFICATIONS	
S1. Measure Web Page: ***Do you have a web page where current detailed measure specifications can be obtained?*** No	**Eval Rating 2a1/2b1**
S2. General Approach ***If applicable, summarize the general approach or methodology to the measure specification. This is most relevant to measures that are part of or rely on the execution of a measure system or applies to multiple measures.*** All of our submitted measures for CHF rely on a foundational "episodes of care" concept that uses the Ingenix Episode Treatment Groups (ETG) methodology. Episode-based resource use measurement provides a representation of a patient's course of treatment for a specific condition. The attached ETG General Methods Construct Logic provides a high level explanation of our ETG concept and a summary of the ETG approach to creating episodes of care for CHF. Attachment: ETG Construction Logic CHF.doc	
S3. Type of resource use measure: Per episode	

S4. Target Population:

S4.1. Subject/Topic Areas:

Cardiovascular

S4.2. Cross Cutting Areas *(HHS or NPP National health goal/priority)*

Care Coordination
Overuse

S5. Data dictionary or code table
Please provide a web page URL or attachment if exceeds 2 pages. NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less.

Data Dictionary:

URL:
Please supply the username and password:
Attachment: S5_CHF_DataDictionary.xls

Code Table:

URL:
Please supply the username and password:
Attachment: S5_CHF_DataDictionary-634387118359796412.xls

S6.Data Protocol (Resource Use Measure Module 1)
The measure developer must determine which of the following data protocol steps: data preparation, data inclusion criteria, data exclusion criteria, and missing data, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

Data Protocol Supplemental Attachment or URL:
If needed, attach document that supplements information provided for data protocol for analysis, data inclusion criteria, data exclusion criteria, and missing data (Save file as: S6_Data Protocol). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.

URL:
Please supply the username and password:
Attachment: S6_DataProtocol.xls

S6.1. Data preparation for analysis
Detail (specify) the data preparation steps and provide rationale for this methodology.

Guidelines : Administrative medical and pharmacy claims, member enrollment and demographic information and provider characteristics describe the primary data sources used in creating ETG CHF episodes of care and measures of resource use per episode. The key data elements required to support ETG processing and the creation of resource use per episode measures for CHF are detailed in attachment S6_DataProtocol.

General recommendations for preparing data for ETG processing and the creation of resource use sub-measures are as follows:

-- The data for all required elements should be complete, valid and consistently populated. In particular:

-- Only final claims should be included in processing. Adjustments and pended/non-fully adjudicated claims should be removed;

-- All recorded diagnosis, procedure and NDC codes should be included and conform to standard ICD-9, HCPCS, CPT, NUBC revenue code and NDC coding conventions. Any non-standard, or "local" codes should be cross-walked to a valid code;

-- An assessment of the relative validity of diagnosis and procedural coding should be made. If significant differences in the prevalence or validity of diagnosis and procedural coding are observed across populations, data sources or administrative claims systems, these discrepancies should be validated and addressed, if relevant. If systematic discrepancies and data issues are the result of incomplete data, the members impacted by the incomplete information should be excluded from processing and measurement. An example is a defined population with significant evidence of missing or invalid coding or a population where primary care capitation is in place and claims or encounters for those services are not available;

-- Financial fields should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example;

-- An assessment of the relative validity of the financial information should be made. Systematic gaps in financial data should be validated and if resulting from incomplete data, the members impacted by the incomplete information should be excluded from processing. An example is a defined population with significant evidence of missing or invalid financial data where options are not available to estimate the financial amounts;

-- Inpatient facility claims should accurately represent the admission and discharge dates for the inpatient stay. Interim facility bills where the patient has not been discharged should reflect the time period of the services rendered and captured on the interim bill.

-- The member IDs used to identify a member should be unique – describing an individual member. The member ID field across claims and membership should follow the same format. Duplicate IDs for a member are not recommended;

-- Each member enrollment record should describe a unique enrollment span, that is, the input data includes one row per member for each continuously enrolled period where the member has consistent attributes. A member may have multiple enrollment records reflecting a gap in enrollment or a change to their member attributes (i.e. PCP or Pharmacy Benefit) over time.

-- It is recommended that member enrollment span overlaps are reconciled prior to processing;

-- A member's pharmacy benefit status should be noted and reflects whether or not the member has pharmacy data generally available for use in measurement. Examples of populations where pharmacy data may not be available include the individual not have pharmacy coverage for the defined enrollment period or pharmacy services managed by a pharmacy benefits manager (PBM) and the PBM data has not been integrated with the medical claims;

-- The provider IDs used to identify a provider should be unique – describing an individual physician or other provider. The provider ID field across claims and membership (Assigned PCP) should follow the same format. Duplicate IDs for a provider are not recommended;

-- Each provider ID should be assigned a specialty that reflects the primary specialty of the provider. This information is used to support valid episode grouping and also to assign providers to an appropriate peer group to support episode analysis;

-- A place of service crosswalk table that maps each native place of service code to a standard format is required. Ingenix valid values include:
-- 11 – Office
-- 12 – Home
-- 21 – Inpatient Hospital
-- 22 – Outpatient Hospital

-- 23 – Emergency Room, Hospital
-- 24 – Ambulatory Surgical Center
-- 31 – Skilled Nursing Facility
-- 39 – Nursing Home, Custodial, Hospice
-- 49 – Ambulance
-- 51 – Inpatient Psychiatric Facility
-- 59 – Psychiatric Facility
-- 61 – Comprehensive Inpatient Facility
-- 69 – Rehab Facility
-- 81 – Independent Lab
-- 99 – Unknown or Other (this POS value should represent a small portion of the data for optimal results)
-- Provider Specialty on claims should accurately reflect the service category of the claim and support assignment of ETG Type of Provider for each claim. Type of Provider values used to support ETG processing include:
-- 0 – Clinician
-- 1 – Facility
-- 2 – Other
- Place of Service, Provider Specialty, CPT/HCPC Procedure Codes and Revenue codes should be accurate and support assignment of ETG Type of Service for each claim. Type of Service values used to support ETG processing include:
-- 0 – Ancillary
-- 1 – Medical/Surgical
-- 2 – Room and Board

S6.2.Data inclusion criteria
Detail initial data inclusion criteria and rationale(related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : In creating CHF episodes of care, ETG includes all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG methodology does not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers, non-standard diagnosis or procedural coding and other invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

In terms of resource use measure construction following ETG grouping, no additional data inclusion criteria are applied. Only CHF episodes are included in the measurement of CHF episode-based resource use, including the individual services that ETG groups to those episodes. As noted below in section 6.3, it is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated appropriately.

S6.3. Data exclusion criteria
Detail initial data exclusion criteria and rationale (related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : As described in the submission for S6.2, for the application of ETG episode logic for CHF, ETG accepts all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG methodology does not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers, non-standard diagnosis or procedural coding and other invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

ETG does include logic to identify high or low cost outliers at the episode level. Although this is not the same as detailed service level data exclusions, inappropriately high individual claims or mispriced claims, in general, will impact the outlier treatment of the CHF episodes the claim is grouped to.

In terms of resource use measure construction following ETG grouping, no additional data exclusion criteria are applied. Only CHF episodes are included in the measurement of CHF episode-based resource use, including the individual services that ETG groups to those episodes. It is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated appropriately.

S6.4. Missing Data
Detail steps associated with missing data and rationale(e.g., any statistical techniques used)

Specifications : Missing provider specialty assignment will impact the ability to assign record type to a claim line. In addition invalid and incomplete diagnosis and procedure coding will impact the results of the episode grouping and the measures for CHF. For example, inaccurate coding may result in a service record not grouping to a CHF episode – due to the miscoding of a CHF diagnosis or the procedure code assigned to the service. ETG will attempt to group these services. However, invalid data may prevent this grouping to happen in an appropriate way. In this way, ETG handles data quality issues through the rigor of the logic designed to create appropriate episodes.

In terms of working with missing information during the episode grouping process, ETG uses the following approaches:

-- Missing Diagnosis Codes: If all four diagnosis codes are missing from a non-pharmaceutical claim the ETG application will use the procedure code to group, except when the procedure code requires a valid diagnosis code to be present. This requirement is per the ETG eligibility table. In cases where all diagnosis codes are missing and the procedure requires a valid diagnosis code to also be present, the service record will not group to a CHF episode and will be assigned to an error ETG.

-- Missing Procedure Codes: If there is no procedure code on a service record then the record will group based on the diagnosis codes or NDC drug code. If there is no diagnosis, procedure or pharmacy code on the claim, then the claim will not group to a CHF episode and will have an error code assigned to it.

--Missing Provider Specialty: If the provider specialty is not available on a service record then the record will be assigned an error ETG code and will not group to a CHF episode.

The services not assigned to an episode and noted as "errors" based on missing data are marked with an error ETG number. Services with these ETG numbers would not be included in a CHF episode or be used in episode-based resource measurement for CHF.

-- Missing Pharmacy Data: For some members and populations, pharmacy data can be missing generally, due to the different factors, including not having a pharmacy benefit with the entity collecting the data used in measurement or pharmacy services being managed by a pharmacy benefits manager (PBM) for the measurement entity. Where pharmacy data are not generally available for a member, adjustments are required to ensure valid comparisons.

The ETG grouping methodology for CHF itself does not require pharmacy data. Pharmacy services are treated as ancillary records and can never start an episode for CHF. Pharmacy services will join CHF episodes. However, missing pharmacy records will impact the observed cost of an episode – which will be underestimated, on average, where pharmacy data are missing. It is recommended that pharmacy benefit/data status be used as a separate category in risk adjusting pharmacy and total costs per episode. For example, the expected or "peer" results for a physician should reflect their mix of members with and without pharmacy benefits/data.

Eval Rating 2a1

H☐ M☐ L☐ I☐

S7. Data Type: Administrative claims
Other

S7.1. Data Source or Collection Instrument
Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc.)

Both medical and pharmacy administrative service records (claims or encounters) are used to support the measures. Member enrollment span, pharmacy benefit status and age and gender are also required. Provider characteristics, including specialty and unique provider identifier also have importance to support episode grouping, attribution and definition of peers.

S7.2. Data Source or Collection Instrument Reference
(Please provide a web page URL or attachment). NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less)

URL:

Eval Rating 2b1

H☐ M☐ L☐ I☐

Please supply the username and password:
Attachment: S7.2_Data Source Reference.xls

S8.Measure Clinical Logic (Resource Use Measure Module 2)
The measure's clinical logic includes the steps that identify the condition or event of interest and any clustering of diagnoses or procedures. For example, the diagnoses and procedures that qualifies for a cardiac heart failure episode, including any disease interaction, comorbid conditions, or hierarchical structure to the clinical logic of the model. (Some of the steps listed separately below may be embedded in the risk adjustment description, if so, please indicate NA and in the rationale space list 'see risk adjustment details.')

Clinical Logic Supplemental Attachment or URL:
If needed, provide a URL or document that supplements information provided for the clinical framework, co-morbid interactions, clinical hierarchies, clinical severity levels, and concurrency of clinical events

URL:
Please supply the username and password:
Attachment: S8_CHF_ClinicalLogic.xls

S8.1. Brief Description of Clinical Framework
Briefly describe your clinical logic approach including clinical topic area, whether or not you account for comorbid and interactions, clinical hierarchies, clinical severity levels and concurrency of clinical events.

This measure identifies patients with CHF and creates CHF episodes of care using the ETG methodology described in the ETG Construction Logic attached in our response to S.2. Each episode of CHF is characterized by an ETG Base class ID that specifies the type of condition; the ETG Base class ID representing CHF is 386800.

An episode of CHF will contain all clinically relevant information related to the condition. In addition to this information, certain diagnoses are considered co-morbidities or condition status factors for CHF. For example, Rheumatic Heart Failure is a condition status factor and Diabetes is a comorbidity for CHF.

Each episode is assigned a severity level based on age, gender and the observed comorbidity and condition status factors. The severity level is an indicator of the relative resources expected to be required for the given episode of CHF.

The CHF episode clinical framework is defined by the services, or claim lines, that can begin an episode, the primary and incidental diagnosis relationships involved, how records group to an episode, including relative strength of relationship, and the severity logic employed.

S8.2. Clinical framework
Detail any clustering and the assignment of codes, including the grouping methodology, the assignment algorithm, and relevant codes and rationale for these methodologies.

The CHF measure's episodes are defined using the Episode Treatment Group (ETG) methodology. Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_CHF. This attachment provides an overview of ETGs and a summary of the methodology used for CHF episodes.
- S5_CHF_DataDictionary (Excel workbook attachment). This attachment describes the clinical relationships between diagnosis and procedure codes and the episode condition.
- S8_CHF_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CHF methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

The individual Worksheets in these attachments that relate to the specific components of the methodology are referenced in the following specification.

The CHF ETG episode building process that supports CHF resource use measures has four important steps:
Step 1: Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
Step 2: Build Episodes from Anchor Records
Step 3: Group Non-Anchor Records to Episodes
Step 4: Finalize the Episodes (identify co-morbidities and complicating factors, and assign episode severity)

This section (S8.2 Clinical Framework) describes the first three steps in the episode building process. Sections S8.3 and S8.5 describe episode co-morbidities and condition status factors and episode severity.

Step 1- Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
Assign services to record types, identify anchor records and classify diagnoses and procedures on service records to support the creation of CHF and other episodes.

Step 1A: Assign Record Type to each Service:

Assign each service to one of the following 5 record types:

-- Facility: A claim record submitted by a treatment facility for room & board charges (F)
-- Surgery: A claim record submitted by a provider for surgical or related procedure (S)
-- Management: A claim record submitted by a provider related to the evaluation of a patient's condition (M)
-- Ancillary: A claim record submitted by any provider for laboratory, radiological or similar services (A)
-- Pharmaceutical: A claim record for a prescription drug claim (P)

Assign record type based upon servicing provider type and the nature of the service procedure.
- Assign provider type based on the specialty of the service provider. The "ExTypeOfProvider" worksheet of the attachment S5_CHF_DataDIctionary includes an example mapping of specialty to provider type. Based upon the specialty of the service provider on the claim record the provider type recognized by ETG is assigned. For example, using the "ExTypeOfProvider" worksheet a provider specialty code of 100 on the claim would be assigned the ETG provider type of Facility.
- Type of service is based on the service procedure code (CPT, HCPCS, Revenue, NDC). The worksheet "ProcToRecordType" in the attachment S5_CHF_DataDictionary includes the information required to assign record type based upon the procedure code on the claim record.
- Use the combination of type of provider and type of service to determine record type. The worksheet "ProcToRecordType" in the attachment S5_CHF_DataDictionary provides a mapping of provider type and type of service to record type. For example, procedure code 99025 (Initial surgical evaluation) is assigned a record type of Management (M) when the provider type is either clinician (see column "Clinician Record Type" where procedureCode=99025) or a facility (see column "Facility Record Type" where procedureCode=99025). This same procedure code would be assigned a record type of Ancillary (A) when the provider type is non-clinician (see column "Non-Clinician Record Type" where procedureCode=99025).

Examples of record type assignment include:
- An office visit record provided by an internist will be assigned a "Clinician" provider type and a record type of "Management (M)"
- A cholecystectomy provided by a general surgeon will be assigned a "Clinician" provider type and a record type of "Surgery (S)"
- A pharmacy prescription will be assigned a record type of "Pharmaceutical (P)"
- An injection for chemotherapy (e.g., HCHPS J-code) will also be assigned a record type of "Pharmaceutical (P)"
- An imaging service provided by a radiologist, orthopedic surgeon, facility or any provider will be assigned a record type of "Ancillary (A)".

The worksheet "ExRecordType" in the attachment S5_CHF_DataDictionary includes further examples.

The assigned record type provides information to the CHF episode-building methodology about the nature of the service and whether the diagnostic and other information on the service provides confirmatory information for a clinician service (versus potentially rule-out information from imaging, lab or other diagnostic services). Record type plays an important role in how services can trigger episodes of care and join and/or modify existing episodes.

Step 1B: Identify Anchor Records. The record type assigned in Step 1A is used to identify anchor records. An anchor record indicates that a clinician has evaluated the patient, assigned a diagnosis and has initiated the treatment and care of the patient for the condition. If the record type assigned to the service is M, S, or F (Management, Surgery or Facility), the service is an anchor record. All other services are considered non-anchor records.

Steps 1C through 1F: Before episodes can be built from anchor records and non-anchor services can be assigned to episodes, the relationship of diagnoses and procedures to each condition, including CHF, need to be assigned. Steps 1C through 1F describe how these relationships are defined. These initial steps categorize diagnoses and procedures relative to each condition, saving this information for use in the subsequent steps described in Step 2 and Step 3.
Note that in some instances a service may have a potential clinical relationship to more than one condition. This concept has importance to episode building, in general, and for episodes of CHF. While each service can inform grouping decisions across multiple episodes, the ETG methodology assigns each service uniquely to a single episode. Such an approach ensures that double-counting does not occur when considering service cost and utilization in the creation of resource use measures. As a result, accurate decisions on assigning a service to an episode of CHF or to another condition require the assessment of both the relationship of a service to CHF and to all other conditions for a patient. The methodology described in this section classifies diagnoses and procedures based on their relationship to CHF and also the strength of that relationship relative to other conditions. Using ETG, accurate episode grouping for CHF and other conditions must occur in the context of all of a patient's conditions.

Step 1C: Assign Diagnoses to Diagnosis Class
Assign each ICD-9 diagnosis code to a "diagnosis class". There are three diagnosis classes applied across all diagnosis codes, including diagnosis codes eligible for CHF:
- Specific: These diagnosis codes indicate a specific disease as opposed to a sign or symptom. These codes are specific enough to be linked to a single ETG. ICD-9 diagnosis code 428.0 (congestive heart failure, unspecified) is an example of a specific diagnosis code for CHF. It is primary to, and only eligible for an episode of CHF. Specific diagnosis codes are usually primary to and eligible for a single ETG.
- Non-Specific: Like specific diagnoses, these diagnosis codes represent a disease or condition, but are not specific enough to support linkage to a single condition. Cardiomyopathy (ICD-9 425) is an example of a non-specific diagnosis for CHF. Although Cardiomyopathy represents disease as opposed to a sign or symptoms, it is not specific as to representing a single disease. Services with this diagnosis will be assigned to an episode based on both information related to a CHF episode as well as information related to other potential conditions.
- Signs and Symptom: These diagnosis codes represent signs and symptoms of disease as opposed to a disease or condition. For example, Chest Pain (ICD-9 diagnosis code 786.5) represents a sign and symptom rather than a disease. Chest Pain could be related to multiple diseases. ETG assigns sign and symptoms diagnoses to the lowest specificity. Services with signs and symptoms diagnosis codes may be eligible for many ETGs due to their generic nature. These services will be gathered to episodes as a later step in the grouping process, after other, more specific, information has been considered.
Diagnosis class assignments determine how a service is grouped to an episode and the order in which it is considered. The ETG methodology considers one person at a time and an individual's medical and pharmacy service records are grouped in several distinct passes. The methodology first processes the specific and non-specific diagnosis codes on anchor records so that concrete conditions/diseases are created. It then processes services with sign and symptom diagnosis codes in reverse chronological order (based on dates of service) to determine the best episode these services can group to.

Step 1D: Identify the Clinical Relationship Between Diagnosis Codes and Conditions, Including CHF
Match each diagnosis code with one or more conditions (ETGs) through a diagnosis eligibility table. In addition to mapping diagnosis codes to conditions, each diagnosis code is further ranked, based on its strength of association with a condition. A rank of "primary" or "incidental" is assigned to each diagnosis and condition combination, with a further ranking assigned to incidental relationships:
- Primary: A "primary" diagnosis/condition relationship is assigned where the diagnosis defines that condition. The diagnosis codes that are classified as primary to CHF are listed on the "PrimaryDxCodes" worksheet within the attachment "S5_CHF_DataDictionary" (Note: the word "primary" here is used to describe the relationship between a diagnosis and an episode, it is not used to indicate the position of the diagnosis code on the claim line. The diagnosis in any position on the claim line can have a primary relationship with CHF). This map is used to identify primary diagnoses for CHF. Examples of diagnoses ranked as primary for CHF are 428.0 (Congestive Heart Failure), 428.1 (Left Heart Failure) and 428.2 (Systolic Heart Failure). Primary diagnosis codes can only be ranked as primary for a single ETG condition.
- Incidental: These diagnosis codes are eligible for a condition but are not classified as primary. These diagnosis codes

can be incidental to other conditions. To support the linkage of these diagnosis codes to a final episode, a further ranking is assigned for each condition based on the relative strength of association between the diagnosis and condition. Values of low, medium, or high are assigned for each diagnosis/condition. The Diagnosis codes that are incidental to CHF are listed on the "IncidentalDxCodes" worksheet within the attachment "S5_CHF_DataDictionary". The column "diagnosisEligibilityType" in the worksheet describes the relative strength ranking where 3 represents a high association, 2 represents a medium association and 1 represents a low association.

Step 1E: Identify Relationships between Procedure Codes and Conditions, Including CHF

Match each procedure code with one or more conditions, including CHF, through a procedure eligibility table. All procedure codes that are eligible for CHF are listed on the "ProcedureCodes" worksheet within attachment "S5_CHF_DataDictionary". In the same way diagnoses can relate multiple conditions, a procedure can relate to more than one episode. The ProcedureCodes worksheet also includes a ranking of the strength of the clinical relationship of each CPT and HCPCS code with CHF, ranked from 1 to 4 based on the relative strength of the clinical relationship between the procedure and CHF. This relationship is included in the "ProcedureRank" column in the worksheet. A rank of 4 represents the strongest association and a rank of 1 the lowest. In this way, ETG considers not only the diagnostic information on a service when making grouping decisions around CHF, but also the service procedure and the strength of the relationship between the procedure and CHF relative to other potential conditions.

Step 1F: Identify Relationships Between Pharmacy Services and Conditions, Including CHF

The relationship between pharmacy services and CHF and other conditions is based on the pharmacy code assigned to the service. To support this assessment, the ETG methodology assigns each pharmacy service to a Drug Category Code (DCC). The DCC describes the drug's active ingredients and route of administration. DCCs are then mapped to ETGs and define the relationships between a drug and a condition. Most pharmacy services are defined using NDC procedure codes, however selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC by ETG (e.g., J-codes describing injections).

The "Pharmacy" worksheet in the attachment "S5_CHF_DataDictionary" describes the DCCs assigned to CHF. Similar to diagnoses and procedures, there are some instances a DCC code may be eligible for more than one ETG. In these cases, the ETG methodology uses strength of the clinical relationship between the DCC code and the episode condition. The "Rank" in the worksheet describes this strength of association for each DCC and CHF. The lower the value is for Rank, the stronger the association between the DCC and the episode. If multiple episodes are competing for a pharmacy service, this rank is used to support decisions on assignment.

Given the clinical relationships described in Steps 1A through 1F, the following steps are used to build episodes from anchor records.

Step 2- Build Episodes from Anchor Records.

Building CHF episodes from anchor records is a multi-step process that utilizes diagnostic and procedural information and the clinical relationships defined in Step 1. Anchor records are grouped in two passes through the patient's data. The first pass groups the anchor records with specific and non-specific diagnoses. The second pass groups anchor records with sign and symptoms diagnoses. All anchor records are grouped before all non-anchor records.

Step 2A: Use Anchor Records to Start an Episode of CHF Using Specific and Non-Specific Diagnoses

A service must be an anchor record to start an episode of CHF. The service must also have a procedure code that is eligible for CHF and an ICD-9 diagnosis code that is primary for CHF. See worksheets "PrimaryDxCodes" and "ProcedureCodes" within attachment S5_CHF_DataDictionary for a complete list of diagnosis codes and procedure codes that are primary for CHF. All codes within the "PrimaryDxCodes" worksheet are considered primary to CHF. If an anchor record meeting these requirements is observed, start an episode for CHF.

As an example of an anchor record that starts an episode of CHF, a cardiologist sees a patient and submits a claim record using the CPT procedure code 99212 (Office visit, established patient) with and ICD-9 diagnosis code 428.0 (congestive heart failure, unspecified).

Note that a single anchor record can start more than one episode. For example, an anchor record with a diagnosis and procedure code combination that is eligible for CHF will start a CHF episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it will also start a Hypertension episode. (See Section I of the Attachment for S2 above for a discussion of the concept of "phantom episode clusters".)

Step 2B: Group Anchor Records to an Episode of CHF Using Specific and Non-Specific Diagnoses

Once an episode of CHF is started, group further anchor records to that episode. Consider specific and non-specific diagnoses on anchor records first.

First identify whether the anchor record is eligible for CHF. Eligible anchor records for CHF have a procedure code eligible for CHF and a diagnosis code that has either a primary or incidental relationship to CHF. See the "ProcedureCodes" worksheet within S5_CHF_DataDictionary for the procedure codes eligible for CHF. See the "PrimaryDxCodes" and "IncidentalDxCodes" worksheets within S5_CHF_DataDictionary for a list of the diagnosis codes primary and incidental to CHF.
For anchor records with eligibility to a CHF episode, apply the following steps to assign the anchor record to an episode.
Step 2B1 - If the anchor record is only eligible for the open CHF episode, group the anchor record to the CHF episode.
In some cases, an anchor record can be eligible to join more than one episode. This is true because a service may have more than one diagnosis code. Further, diagnosis codes that are incidental for CHF may also be eligible for another ETG condition.
Step 2B2 - If the anchor record is eligible for the CHF episode and another episode for the patient, apply the following tie-breaking steps to determine the episode an anchor record groups to:
-Assess the specificity of the diagnoses on the anchor record. Diagnosis class describes this specificity and was assigned to each diagnosis code in Step 1C (specific or non-specific).
-Assign the anchor record to an episode based on the diagnosis class. Episodes related to specific diagnoses take precedence over episodes related to non-specific diagnoses.
Specific diagnoses:
-If a diagnosis on the anchor record is specific and has a relationship with a single episode, assign the anchor record to that episode.
-If the anchor record has more than one specific diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the anchor record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the specific diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. Primary relationships between diagnosis codes and episode conditions have precedence over incidental relationships.
-If the strength of the relationship between the specific diagnosis codes and the episode conditions is the same, the time between the anchor record and the closest anchor for the open episode is used.
Non-specific diagnoses:
-If no specific diagnoses are observed on the anchor record, consider non-specific diagnoses in assigning the anchor record to an episode. Apply the same order of logic described directly above for specific diagnoses to the assignment of anchor records based on non-specific diagnoses.
At the completion of Step 2B, each anchor record with a specific or non-specific diagnosis has been assigned to an episode, including episodes of CHF.
Note that in the same way a single anchor record can start more than one episode (Step 2A), a single anchor record can also extend more than one episode, however the anchor record itself can only be assigned to one episode, as described above. For example, an anchor record with a diagnosis and procedure code combination that is eligible for CHF can extend a CHF episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it can also extend a Hypertension episode. (See Section I of the Attachment for S2 above for a discussion of the concept of "phantom episode clusters" and the concept of extending episodes.)

Step 2C: Group Anchor Records to an Episode of CHF Using Sign and Symptom Diagnoses
The last step in grouping Anchor records to CHF and other episodes involves processing anchor records with only sign and symptom diagnosis codes. All sign and symptom diagnosis codes for CHF are listed within the S5_CHF_DataDictionary on worksheet "IncidentalDxCodes" where column "specificity"="Sign and Symptom". An example is Chest Pain (ICD-9 786.5).
For these anchor records with eligibility to a CHF episode, apply the following steps to assign the anchor record to an episode.
Step 2C1 - If the anchor record is only eligible for the open CHF episode, group the anchor record to the CHF episode.
Step 2C2 - If the anchor record is eligible for the CHF episode and another episode for the patient, apply the following tie-breaking steps to determine the episode an anchor record groups to:
-If the anchor record has more than one sign and symptom diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the anchor record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the sign and symptom diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions

are described as primary or incidental. For sign and symptom diagnoses, incidental relationships between diagnosis codes and episode conditions have precedence over primary relationships.
-If the strength of the relationship between the sign and symptom diagnosis codes and the episode conditions is the same, the time between the anchor record and the closest anchor for the open episode is used.
At the completion of Step 2C, each anchor record with a sign and symptom diagnosis has been assigned to an episode, including episodes of CHF.
After completing these steps, anchor records have been used to open episodes of CHF, as well as episodes for other conditions. Anchor records have been assigned uniquely to individual episodes based on the clinical logic described above and in the attachment "S5_CHF_DataDictionary".

Step 3. Group Non-Anchor Records to Episodes.
Non-anchor records (record type "Ancillary" and "Pharmacy") can not open episodes on their own, but can join episodes. For example, a service for a routine ECG with at least 12 leads; with interpretation and report (CPT code 93000), with a diagnosis of 428.0 (congestive heart failure, unspecified) can group to an open episode of CHF but can not open the episode itself.
Step 3A: Group Non-Anchor Records other than Pharmacy to an Episode of CHF Using Specific and Non-Specific Diagnoses
Once an episode of CHF is started and anchor records have been grouped, non-anchor records can group to that episode. Consider specific and non-specific diagnoses on non-anchor records first.
First identify whether the non-anchor record is eligible for CHF. Eligible non-anchor records for CHF have a procedure code eligible for CHF and a diagnosis code that has either a primary or incidental relationship to CHF. See the "ProcedureCodes" worksheet within S5_CHF_DataDictionary for the procedure codes eligible for CHF. See the "Pharmacy" worksheet within S5_CHF_DataDictionary for the pharmacy codes eligible for CHF. See the "PrimaryDxCodes" and "IncidentalDxCodes" worksheets within S5_CHF_DataDictionary for a list of the diagnosis codes primary and incidental to CHF.
For non-anchor records with eligibility to a CHF episode, apply the following steps to assign the record to an episode.
Step 3A1 - If the non-anchor record is only eligible for the open CHF episode, group the record to the CHF episode.
In some cases, a non-anchor record can be eligible to join more than one episode. This is true because a service may have more than one diagnosis code. Further, diagnosis codes that are incidental for CHF may also be eligible for another ETG condition.
Step 3A2 - If the non-anchor record is eligible for the CHF episode and another episode for the patient, apply the following tie-breaking steps to determine the episode the record groups to:
-Assess the specificity of the diagnoses on the non-anchor record. Diagnosis class describes this specificity and was assigned to each diagnosis code in Step 1C (specific or non-specific).
-Assign the non-anchor record to an episode based on the diagnosis class. Episodes related to specific diagnoses take precedence over episodes related to non-specific diagnoses.
Specific diagnoses:
-If a diagnosis on the non-anchor record is specific and has a relationship with a single episode, assign the record to that episode.
-If the non-anchor record has more than one specific diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the specific diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the non-anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. Primary relationships between diagnosis codes and episode conditions have precedence over incidental relationships.
-If the strength of the relationship between the specific diagnosis codes and the episode conditions is the same, the time between the non-anchor record and the closest anchor for the open episode is used.
Non-specific diagnoses:
-If no specific diagnoses are observed on the non-anchor record, consider non-specific diagnoses in assigning the record to an episode. Apply the same order of logic described directly above for specific diagnoses to the assignment of non-anchor records based on non-specific diagnoses.
At the completion of Step 3A, each non-anchor record with a specific or non-specific diagnosis has been assigned to an episode, including episodes of CHF.

Step 3B: Group Non-Anchor Records other than Pharmacy to an Episode of CHF Using Sign and Symptom Diagnoses
The last step in grouping non-anchor records to CHF and other episodes involves processing non-anchor records with

only sign and symptom diagnosis codes. All sign and symptom diagnosis codes for CHF are listed within the S5_CHF_DataDictionary on worksheet "IncidentalDxCodes" where column "specificity"="Sign and Symptom". An example is Chest Pain (ICD-9 786.5).
For these non-anchor records with eligibility to a CHF episode, apply the following steps to assign the record to an episode.
Step 3B1 -If the non-anchor record is only eligible for the open CHF episode, group the record to the CHF episode.
Step 3B2 - If the anchor record is eligible for the CHF episode and another episode for the patient, apply the following tie-breaking steps to determine the episode the record groups to:
-If the non-anchor record has more than one sign and symptom diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the record to determine the episode that the record groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the sign and symptom diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the non-anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. For sign and symptom diagnoses, incidental relationships between diagnosis codes and episode conditions have precedence over primary relationships.
-If the strength of the relationship between the sign and symptom diagnosis codes and the episode conditions is the same, the time between the non-anchor record and the closest anchor for the open episode is used.

Step 3C: Group Pharmacy Records to an Episode of CHF
Pharmacy services group differently than other non-anchor records because they usually do not have ICD-9 diagnosis codes associated with them to use in grouping. Instead, pharmacy records are assigned to CHF and other episodes using a table that maps NDC to a DCC code (Drug Category Code) based on the drug's active ingredients and route of administration. A DCC to ETG map is then used to inform the grouping for the service. The relationship between DCC codes and CHF are described in the "Pharmacy" worksheet in the attachment "S5_CHF_DataDictionary".
In some instances a DCC code may be eligible for CHF and another open episode for a patient. In these cases, where multiple episodes are observed for a patient where the DCC code has eligibility, use the strength of the clinical relationship between the DCC code and the episode to determine final assignment. The column "Rank" in the "Pharmacy" worksheet within attachment "S5_CHF_DataDictionary" describes that strength of association. The lower the value is for Rank, the stronger the association between the DCC and the episode.

Due to the size of the attachment the full list of NDC to DCC mappings has not been provided within this submission. This file is available upon request. The DCC mappings included in the S5 attachment provide a summary of the key clinical relationships between drugs and the conditions described by the relevant ETGs The NDC to DCC map would include the individual NDCs within a DCC that map to those relationships.

At the completion of Step 3C, all relevant records for CHF episodes have been assigned.

Step 4: Finalize the Episodes

Finalizing an episode of CHF involves determining whether or not the episode is complete, assigning co-morbidities and condition status factors and calculating a severity score and associated severity level. Co-morbidities and condition status factors will be discussed in section 8.3 and severity score calculation and level assignment is addressed in section 8.5.
In terms of episode completeness, CHF is a life-long, chronic condition. Therefore the general clean period logic described in the attachment for question S2 above is not applicable. All clinically consistent treatments for the care of a CHF patient will group to the episode of CHF for as long as data are available. (For the convenience of analytics and measurement, it is customary to segment chronic episodes, including CHF, into year long episode units.)

S8.3. Comorbid and interactions
Detail the treatment of co-morbidities & disease interactions and provide rationale for this methodology.

Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_CHF. This attachment provides an overview of ETGs and a summary of the

methodology used for CHF episodes.
- S8_CHF_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CHF methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

Co-morbidities and condition status factors are identified for each CHF episode. These factors provide specificity of the episode's clinical condition and also play a key role in assigning a severity score and level to the episode.

Steps to Assign Co-morbidities and Condition Status Factors to CHF Episodes:

Step 1 – Condition Status Factors for CHF Episodes.

Each CHF episode is evaluated to determine whether any Condition Status Factors for CHF are observed, To do this, the anchor records for the episode are evaluated using a comparison of their ICD-9 diagnoses with the diagnoses for the conditions status factors for CHF. The condition status factors used for CHF and the matching diagnoses for each are included in the "ConditionStatustoDxCodeMap" Worksheet in the attachment "S8_CHF_ClinicalLogic".

The following condition status factors are defined for CHF:
-- Congestive heart failure, with diastolic heart failure
-- Rheumatic heart failure

If these Condition Status Factor diagnosis codes are present on the anchor records for a CHF episode, that condition status factor is recorded for the episode.

Step 2 –Comorbidity Factors for CHF Episodes.

Each CHF episode is evaluated to determine whether any Comorbidity Factors for CHF are observed, To do this, the anchor records outside the CHF episode are evaluated using a comparison of their ICD-9 diagnoses with the diagnoses for the comorbidity factors for CHF. The comorbidity used for CHF and the matching diagnoses for each are included in the "ComorbtoDxCodeMap" Worksheet in the attachment "S8_CHF_ClinicalLogic".

Examples of the comorbidity groups for CHF include Pulmonary Tuberculosis, Ischemic Heart Disease and Pulmonary Embolism. In the example included in the S8_CHF_ClinicalLogic attachment (see worksheet "ExSevScore&Level"), the co-morbidities 80018 (diabetes) and 80173 (cardiomyopathy) are assigned to the CHF episode based upon the diagnosis information on anchor records that occur outside of the CHF episode.
Interactions between two co-morbidities or two condition status factors are also identified for CHF. These interactions are used in assigning severity to a CHF episode and are described in section 8.5.

S8.4. Clinical hierarchies
Detail the hierarchy for codes or condition groups used and provide rationale for this methodology.

As noted in S8.2 and S8.3, ETG uses different clinical relationships between diagnosis and procedure codes and conditions to support the creation of CHF episodes. Many of these relationships involve clinical hierarchies, including how specific and non-specific and signs and symptoms diagnosis codes are used. The relationship between primary and incidental diagnoses and the strength of association of incidental diagnoses to CHF and other episode concepts is a further example. A third example is the procedure hierarchies that apply across all concepts for CHF. Please see specifications S8.2 and S8.3 and the attachment for S2 for a summary of the role of rankings, strength of association and hierarchies are used in the ETG methodology for CHF. Further, as described below in the specification of severity adjustment, ETG also uses hierarchies to identify the most important co-morbidities within a related set of co-morbidities for use in measuring severity.

S8.5. Clinical severity levels
Detail the method used for assigning severity level and provide rationale for this methodology.

Please note that this specification will reference different attachments included with the submission for these measures,

including:

- S2_ETG_Construction_Logic_CHF. This attachment provides an overview of ETGs and a summary of the methodology used for CHF episodes.
- S8_CHF_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CHF methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

More specifically, apply the following steps:

Step 1 – Identify Condition Status Factors and Comorbidities in an Episode

Assignment of severity occurs after the identification of condition status factors and comorbidities as detailed in specification S8.3. Interactions between various co-morbidities also play a role in severity assignment as well as demographic factors. The combination of all of these factors are used to describe a "severity" score and level for an episode, where a higher level of severity indicates an expectation of a higher level of resources required to diagnose, manage and treat an episode of CHF.

The steps required to identify condition status and comorbidity factors for CHF are described in S8.3.

Step 2 – Map Episode Comorbidities to the Final Comorbidities used to Calculate Episode Severity

The individual comorbidities identified in S8.3 are further grouped to the final comorbidity factors used in calculating episode severity. This step is performed to combine the effects of related comorbidities on severity. Further, in some cases, hierarchies are used to limit final factors to those comorbidities within a related group that have the greatest impact on episode severity. For example, for CHF, Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, Chronic bronchitis, and Asthma are are all qualified as comorbidities and are all conditions categorized as Bronchial Inflammation. Given the related nature of these comorbidities, only one factor is used as the final comorbidity factor for computing severity. Steps 2.1 through 2.4 describe how this final comorbidity is selected.

Worksheet "Comorbidities" – includes the ComorbidityCodes and Comorbidity Groups used to determine severity for CHF. Co-MorbidityGroup2 is the final comorbidity factor used to compute episode severity. To determine this factor:

Step 2.1 – Assign ComorbidtyGroup1 and ComorbidityGroup2 to each ComorbidityCode. Using Bronchial Inflammation as an example, Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, Chronic bronchitis, and Asthma would all be assigned to Bronchial Inflammation for ComorbidityGroup1. Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, and Chronic bronchitis would be assigned to "Bronchial Inflammation 2" for ComorbidityGroup2 and Asthma would be assigned to "Bronchial Inflammation 1" for ComorbidityGroup2.
Step 2.2 – Assign Priority to each ComborbidtyCode. Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, Chronic bronchitis, and Asthma would be assigned a Priority value of 1, 2, 3, and 4, respectively.
Step 2.3 – Across all of the values for ComorbidityCode within each ComorbidityGroup1, select the ComorbidityCode with the lowest value for Priority. As an example, if Chronic bronchitis and Asthma were both observed, Chronic Bronchitis would be selected due to its lower value for Priority (a Priority value of 3 take precedence over a Priority value of 4)

The remaining values for ComorbidityCode and ComorbidityGroup2 define the final comorbidity factors used in determining CHF severity. In the above example (where Chronic bronchitis and Asthma were both observed), Bronchial Inflammation 2 (Chronic Bronchitis) would be selected as the final comorbidity within Bronchial Inflammation.

Step 2.4 – Assign a risk weight to each remaining factor. Each risk weight reflects the incremental contribution of having a specific comorbidity factor on CHF severity. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight. For Bronchial Inflammation 2, a risk weight of 0.2088 would be assigned for a non-elderly patient. A risk weight of 0.2221 would be assigned for an elderly patient .

Step 3 – Identify Comorbidity Interactions

The interaction between two observed comorbidities can contribute to episode severity. Worksheet "ComorbidityInteractions" includes the interactions between Comorbidity Groups used to determine severity for CHF. The table describes pairings of the final comorbidity factors produced by Step 2 (identified by the values for ComorbidityGroup2).

Step 3.1 – Identify pairings of ComorbidtyGroup2 for the episode that are also observed in the Worksheet "ComorbidityInteractions"
Step 3.1 – Assign a risk weight to each qualified interaction. Each risk weight reflects the incremental contribution of having a specific comorbidity interaction on CHF severity. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight.

Step 4 – Identify Comorbidity Counts

For some ETG conditions the number of final comorbidity factors will impact episode severity – for example, where 3 or more co-morbidity factors are observed. For these episodes, a separate Worksheet "ComorbidityCounts" includes these additional severity factors and their assigned risk weights added for those episodes. CHF does not include any Comorbidity Count factors; this step does not apply to CHF.

Step 5 – Condition Status Factors

The Worksheet "ConditionStatuses" – includes the Condition Status factors used to determine severity for CHF. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status factor on CHF severity.

For each condition status factor observed, assign a risk weight. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight.

Step 6 – Identify Condition Status Interactions

For some ETG conditions, the interaction between two observed condition status factors can contribute to episode severity. A separate tab, Worksheet "ConditionStatusInteractions" would be used to identify qualified pairings and their weight in calculating severity. CHF episodes do not use condition status interactions in calculating severity. Step 6 does not apply to CHF.

Step 7 – Identify Condition Status Counts

For some ETG conditions the number of final condition status factors will impact episode severity – for example, where 3 or more condition status factors are observed. For these episodes, a separate Worksheet "ConditionStatusCounts" includes these additional severity factors and their assigned risk weights added for those episodes. CHF does not include any condition status count factors; this step does not apply to CHF.

Step 8 – Assign Demographic Factors

The Worksheet "Demographics" includes the additional severity factors added based on age and gender. Each risk weight reflects the incremental contribution of having a specific Demographic factor on CHF severity. Based on patient age, assign the patient to an age range group. Using gender and age group, assign a demographic factor weight. Use patient age as of the ending date for the measurement period to determine the appropriate age range group.

Step 9 – Compute Severity Score

Sum the risk weights assigned for each of the relevant factors identified above. The sum of these weights is the overall severity score for the episode. As noted above, the higher the severity score for an episode, the more resources are expected relative to other CHF episodes.

As a note, the estimation of the risk weights used in computing severity for CHF episodes is based on empirical analyses of healthcare data for a benchmark population of over 25 million individuals. In particular, multivariate regression analyses were used where cost per episode for individual CHF episodes was the dependent variable and the defined array of co-morbidity and condition status factors and patient age and gender were the independent variables. The model was run separately for individuals 65 and over and those under 65 years of age. The resulting estimated parameters were used to assign weights to each factor described in the above tables. These weights and the presence of a particular set of factors for an episode are used to determine a CHF severity score for the episode.

Step 10 – Compute Severity Level

Based on the severity score, the severity "level" indicates a categorical ranking of where the specific episode is relative to the population of all CHF episodes. There are four potential severity levels for CHF, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. The "Thresholds" Worksheet in attachment "S8_CHF_ClinicalLogic" describe the three cut-off points that define the four levels of severity for CHF episodes.

Assign severity level to the episode depending on the episode severity score calculated in Steps 1-9 and where that score falls within the ranges defined in the "Threshold" Worksheet.

Example: Assigning Severity Score and Level to CHF Episodes

The example included within the S8_CHF_ClinicalLogic attachment (see worksheet "ExSevScore&Level") illustrates the below steps used in the calculation of severity score and level for a CHF episode. The example describes a Male patient, age 60, observed to have a number of anchor records with diagnoses that map to the CHF ETG. The patient is also observed to have two co-morbidities that are also eligible for CHF. The co-morbidities 80018 (diabetes) and 80173 (cardiomyopathy) both were identified on one or more anchor records observed outside of the CHF episode.

Assign severity markers and weights: The patient receives a severity marker for each of the co-morbidity factors and a risk weight is assigned to each. The patient also receives severity weight related to his age and gender which fall into the "Male 55-64" range

Calculate severity score: A severity score of 1.1642 is calculated based upon the sum of:
-- The Demographic weight of 0.2733 (see worksheet "Demographics" within S8_CHF_ClinicalLogic where column "gender"=M and column "ageRange"=55-64);
-- The co-morbidity weight for Diabetes of 0.1513 (see worksheet "Comorbidities" within S8_CHF_ClinicalLogic where column "comorbiditycode"=80018. The Diabetes co-morbidity belongs to the Comorbiditygroup2 of Diabetes.);
-- The co-morbidity weight for Cardiomyopathy of 0.7396 (see worksheet "Comorbidities" within S8_CHF_ClinicalLogic where column "comorbiditycode"=80173. The Cardiomyopathy co-morbidity belongs to the Comorbiditygroup2 of Heart Disease 2.);
--The final severity score, including the co-morbidity interaction adjustment is calculated as 0.2733 + 0.1513 + 0.7396 = 1.1642

Calculate severity level: The severity score of 1.1642 falls with the range of 1.0 to 2.0 and the episode is assigned to Severity Level 3.

S8.6. Concurrency of clinical events (that may lead to a distinct measure)
Detail the method used for identifying concurrent clinical events, how to manage them, and provide the rationale for this methodology.

ETG does provide methodology to deal with cases where a code will shift an episode from one ETG to another. For example, a concurrent renal transplant procedure will shift an episode of ETG Chronic renal failure to an episode of ETG Kidney transplant. There are no codes that will cause an episode of CHF to shift to another ETG.

As described in detail in S8.2, in the case where a diagnosis and procedure code on a claim are eligible for multiple episodes, a specific hierarchy of rules determines the most appropriate episode to group to, based on the rankings of the diagnosis and procedure code for the ETG of each episode. All of the eligibility and ranking information for CHF is described in the attachment for S5.)

For more information about episode building construction/logic, please refer to the attachment for S.2 .

S9. Measure Construction Logic (Resource Use Measure Module 3)
The measure's construction logic includes steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic. For example, any temporal or spatial (i.e., setting of care) parameters used to determine if a particular diagnosis or event qualifies for the measure of interest.

Construction Logic Supplemental Attachment or URL:
If needed, attach supplemental documentation (Save file as: S9_Construction Logic). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.)

URL:
Please supply the username and password:
Attachment:

S9.1. Brief Description of Construction Logic
Briefly describe the measure's construction logic.

Please refer to information provided in S2 and S8 for construction logic

S9.2. Construction Logic
Detail logic steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic.

Please refer to information provided in S2 and S8 for construction logic

S9.3. Measure Trigger and End mechanisms
Detail the measure's trigger and end mechanisms and provide rationale for this methodology.

As described in detail in S8, an episode is triggered by an anchor record. This is a claim record with a procedure indicating a face to face physician encounter, a surgical procedure by a physician or a facility charge indicating a confinement. The rationale for this is that the diagnosis and procedure codes on these record types are most likely to specify a valid clinical condition related to the individual. The length of the episode will depend on the subsequent records that occur within the ETGs clean period. When there is an interval longer than the clean period of the episode without any records eligible to group to the episode, it is considered complete.

CHF is one of a number of ETGs designated as chronic. Once an episode of CHF is triggered, a yearlong episode is created. The start and end dates are configurable by the user. Chronic ETGs specify chronic conditions that are usually life long.
For more information about episode building construction/logic, please refer to S8 and the attachment we provided in s.2 .

S9.4.Measure redundancy or overlap
Detail how redundancy and overlap of measures can be addressed and provide rationale for this methodology.

The ETG application is able to keep related conditions separate. For example, suppose that there are concurrent episodes of CHF and Diabetes and there is record eligible for both ETGs. A specific hierarchy of rules coupled with a

set of eligibility tables with strengths of association of each diagnosis and procedure code for each ETG will uniquely determine which episode the record will group to. There are no ambiguous assignments and episode assignment of each claim record will be unique. For more information about episode building construction/logic, please refer to S8 and the attachment we provided in s.2 .

S9.5.Complementary services
Detail how complementary services have been linked to the measure and provide rationale for this methodology.

ETG does not group based on complimentary services. All claims group to the appropriate episode on their own merits.) For more information about episode building construction/logic, please refer to the attachment we provided in S.2 .

S9.6.Resource Use Service Categories

Inpatient services: Inpatient facility services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department
Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

S9.7.Identification of Resource Use Service Categories
For each of the resource use service categories selected above, provide the rationale for their selection and detail the method or algorithms to identify resource units, including codes, logic and definitions.

The following resource-use categories are included as measures for this submission.

Cost of Care per Episode
1. Total
2. Primary Care Core Services, Total
3. Primary Care Core Services, Visits
4. Primary Care Core Services, Other (Non-Visits)
5. ER Services
6. Hospital Services, Total
7. Inpatient Acute
8. Inpatient Non-Acute
9. Other Outpatient
10. Laboratory Services
11. Radiology Services, Diagnostic, Total
12. Radiology, MRI, CT Scan Services
13. Radiology, Other Diagnostic Services
14. Specialty Care Services, Total
15. Specialty Care, Other Diagnostic Testing Services
16. Specialty Care, Evaluation & Management Services
17. Specialty Care, Medicine Services
18. Specialty Care, Surgery Services
19. Specialty Care, Other Services
20. Pharmacy Prescription Services

Utilization per 1,000 Episodes
1. PCP Visits

2. Specialist Visits
3. Specialist Referrals
4. Total Evaluation & Management Visits
5. ER Visits
6. Hospital Inpatient Admits, Acute
7. Hospital Inpatient Days, Acute
8. Laboratory Services
9. Radiology Services, Diagnostic, Total
10. Radiology Services, MRI/CT Scan Services
11. Radiology Services, Other Diagnostic Services
12. Pharmacy Prescriptions Services

Each resource use category measure is described below, including reference to the specific codes and logic used to identify the services involved.

I. General Methods

The following notes on General Methods apply to all resource measures described here and provide guidelines on service costs, the treatment of incomplete and outlier episodes, and the selection of time periods. The logic described for type of service plays a specific role in each measure. These general methods are employed across all submitted measures:

-- Service cost – as a guideline, the service cost used in resource use measurement should reflect the actual payments or costs associated with the service or a standard-priced resource cost amount. As a further guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example.

-- Complete episodes – Only complete episodes should be included in resource measurement. See the attachment for s.2 for a discussion of how ETG assigns completion status to an episode.

-- Outlier episodes – as a guideline, low outlier cost episodes should be excluded from resource use measurement. High outlier cost episodes should be included, but all costs truncated at the high outlier cost threshold used for the episode (a technique called “winsorization”). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier episode.

-- Episode Time periods – as a guideline, the episodes included in resource use measure should focus on a specific 12 month period, for example, all episodes ending in calendar year 2010.

-- Selecting Clinical Episodes – For CHF, select all remaining episodes with a CHF Base ETG

-- Type of Service. The type of service logic for each measure is described in the sections below. Each type of service definition includes an overview of the key steps used in identifying the relevant services used in measuring cost and utilization. As an initial step, prescription pharmacy services and hospital inpatient confinements are identified (more detail below). For the remaining services:

a. Providers are categorized into facility, anesthesiology specialties and other professional (not anesthesiology);
b. The attached document S9.5_RU_Categories then describes two levels of specifications used in assigning services to a type of service category;
c. The first table in the attachment IMAP_TOS_PROC includes one row per procedure code (CPT, HCPCS, Revenue). For each row, the table includes the procedure code, a short description and the columns PROFTOS, ANESTOS, OPTOS, and PCC_TYPE. PROFTOS, ANESTOS, OPTOS include standard TOS_I codes that are assigned to each procedure code based on whether the provider is a facility, anesthesiologist or other professional, using OPTOS, ANESTOS and PROFTOS, respectively;
d. Some services are also assigned a value for PCC_TYPE (described below);
e. The second table, IMAP_TOS, includes one row for each of the standard TOS codes included in PROFTOS, ANESTOS and PROFTOS and columns for the TOS_I codes, ENC_TOS, and ENC_TOP and a brief description of the TOS_I. ENC_TOS and ENC_TOP are used in defining encounters below.
f. These two tables are used in creating the measures described below.

-- Encounters. An Encounter is contact between an individual and the health care system for a related set of services. It

is based on the type of service and the type of provider for a member on a specific day. Providing the ability to view data by encounters helps convey the scope and influence of all services associated with patient-health care system meetings. The concept of an encounter is used for the utilization measures described below. The following steps are used to assign an encounter value to each service record:

a. Hospital inpatient admissions. A hospital inpatient confinement is considered a single encounter (ENCOUNTER=1).

b. Prescription pharmacy. A pharmacy service record (claim record) is considered a single encounter (ENCOUNTER=1).

c. Ancillary Drug Administered Services. All Ancillary, Drugs Administered (TOS_I values 201 thru 211), are considered an encounter (ENCOUNTER=1).

d. For all other services, the number of encounters is dependent on the Type of Service and the Type of Provider assigned to the claims. In particular, the values included in the table IMAP_TOS for Encounter Type of Service (ENC_TOS) and Encounter Type of Provider (ENC_TOP) are used. As shown in IMAP_TOS, both the Encounter TOS and Encounter TOP are based on Type of Service (TOS_I) and can be assigned using table IMAP_TOS, and joining on TOS_I from the service record.

e. For these other services, medical service records are sorted by Member, Date of Service, ENC_TOS and ENC_TOP.

f. The calculation of encounters for services other than emergency room, laboratory and radiology services is 1 divided by the total number of records in the combination of Member, Date of Service, Encounter TOS, and Encounter TOP.

g. Additional logic. Emergency room, laboratory and radiology services need to have a different logic because these services often are billed using both a technical and professional component – where both a professional provider and facility provider are involved.

h. Any service with the following Encounter TOS values will use the additional logic when calculating encounters.

1. ER professional and facility services (ENC_TOS=24)
2. Lab and pathology professional and facility services (ENC_TOS=29, 31)
3. Diagnostic and therapeutic radiology professional and facility services (ENC_TOS=47, 49)

i. For the services using the additional logic, for each Member, Date of Service, and ENC_TOS distinct combination, sum the number of records for each of the Encounter TOP values of 1 and 2.

1. Two cases can exist for these services: there are both facility and professional records in the combination; or there are only facility records or only professional records.
2. Where at least one facility record and one professional record, the encounter is divided up equally between the professional and technical components. Therefore, the calculations for Encounters for these situations are: 0.5 divided by {number of records with Encounter TOP = 1 (Facility)} and 0.5 divided by {number of records with Encounter TOP = 2 (Professional)}
3. Where all records have the same ENC_TOP value, the encounters calculation will be the generic calculation: 1 divided by {number of records in the combination of Member, Date of Service, Encounter TOS, Encounter TOP}

-- Cost and Utilization Measures. The actual resource use for an episode is the sum of the costs or encounters for those services grouped to the episode. Measures of actual cost or use per episode across episodes, is the sum of cost or use divided by the total number of episodes included in the measurement.

II. Cost of Care per Episode

Total Service Costs. Total services costs include the total costs for all services included in the selected clinical episodes.

Primary Care Core Services Costs. Primary Care Core (PCC) services include a select group of services traditionally performed by an individual's primary care physician. The PCC concept is similar to the idea of the group of services typically included in a primary care capitation definition. In particular, these services include non-inpatient evaluation and management services and selected imaging, diagnostic and minor procedure services. PCC Services are identified as follows:

-- First select services rendered by a primary care provider. The identification of primary care providers can be made configurable. At a minimum, these providers include the individual's assigned PCP. Further, to include covering providers, other primary care providers in the network are included, defined using either a list of provider ids or all physicians with a specialty of internal medicine, family practice, geriatric medicine, adolescent medicine and pediatrics, or both (e.g., using a list to include specific OB/GYN providers in addition to all providers with primary care specialties).

i. The CPT procedure code on the selected services is then used to identify:
1. PCC Services Total
2. PCC Services, Visits and
3. PCC Services Other.
ii. The CPT procedure codes assigned to these categories are included in the column PCC_TYPE in the attachment table IMAP_TOS_PROC. Values of "Visit" and "Other" are used. Blank entries for a procedure code indicate that they are not included as a PCC service.

-- ER Service Costs. These services include professional and facility emergency room services.
i. Professional ER Services are identified as having values of 1803 thru 1805 in IMAP_TOS
ii. Facility ER Services are identified as having values of 801 and 802 in IMAP_TOS

-- Hospital Costs. Includes the facility cost of an inpatient stay and services provided by an outpatient facility other than those defined elsewhere (e.g., ER, Lab, Radiology, Other). These services include professional and facility emergency room services.
i. Inpatient Acute Services are identified as having a value of 601 in IMAP_TOS
ii. Non-Inpatient Acute Services are identified as having a value of 703 in IMAP_TOS
iii. Other Outpatient Hospital Services are identified as having values of 901 thru 1399 in IMAP_TOS

-- Laboratory Services. These services include professional and facility laboratory services, other than those professional services assigned to Primary Care Core.
i. Professional Lab Services are identified as having values of 2101-2118 (Professional, Lab) or 2501-2511 (Professional, Pathology) in IMAP_TOS
ii. Facility LAB Services are identified as having values of 1001 thru 1005 in IMAP_TOS

-- Radiology Services, Diagnostic. These services include diagnostic professional and facility radiology services, other than those professional services assigned to Primary Care Core:
i. Professional Radiology, MRI, CT Scan Services are identified as having values of 2901 thru 2903 in IMAP_TOS
ii. Facility Radiology, MRI, CT Scan Services are identified as having values of 1201, 1203, 1204 in IMAP_TOS
iii. Professional Radiology, Other Diagnostic Services are identified as having values of 2905, 2906, 2907, 2908 in IMAP_TOS
iv. Facility Radiology, Other Diagnostic Services are identified as having values of 1202, 1206, 1207, 1208 in IMAP_TOS
v. Note that Therapeutic Radiology is included in Specialty Care Services, Medicine

-- Specialty Care Services. These services include those services not identified above and are categorized as follows (including TOS_I values in IMAP_TOS):
i. Specialty Care, Other Diagnostic Testing
1. 1701-1733 (Professional, Diagnostic)
ii. Specialty Care, Evaluation & Management
1. 1601-1609 (Professional, Consult)
2. 2001-2013 (Professional, Inpatient Visit)
3. 2401-2411 (Professional, Office Visit)
4. 2717-2719 (Professional, Home Visit)
5. 2729-2731 (Professional, Domiciliary/Rest Home Visit)
6. 2801-2807 (Professional, Preventive Medicine)
7. Excludes any services assigned to Primary Care Core
iii. Specialty Care, Medicine
1. 1401-1405 (Professional, Allergy Tests)
2. 1901-1901 (Professional, Immunizations / Injection)
3. 2909-2915 (Professional, Therapeutic Radiology)
iv. Specialty Care, Surgery
1. 3001-3214 (Professional, Surgery)
v. Specialty Care, Other
1. 101-131 (Ancillary, DME)
2. 201-211 (Ancillary, Drug Admin)

3. 301-307 (Ancillary, Home Health)
4. 401-403, 431 (Ancillary, Services and Supplies)
5. 405-414 (Ancillary, Med and Surg Supplies)
6. 416-424 (Ancillary, Orthotics)
7. 425-429, 432 (Ancillary, Supplies)
8. 433-436 (Ancillary, Oxygen/Resp)
9. 437-446 (Ancillary, Prosthetics)
10. 448-449 (Ancillary, Vision)
11. 450-459 (Ancillary, Rpt/Trking)
12. 501-503 (Ancillary, Transportation)
13. 1501-1599 (Professional, Anesthesia)
14. 2203-2212 (Professional, Mental Health)
15. 2302-2317 (Professional, Obstetrics)
16. 2601-2625 (Professional, Phys Medicine/Rehab)
17. 2701-2715, 2721-2728 (Professional, Professional Other)

III. Utilization per 1,000 Episodes

Encounters are used for all utilization counts for the utilization measures described below.

Evaluation and Management Visits. E&M Visit services by all professional providers and include the following TOS_I values from IMAP_TOS:

i. 1601-1609 (Professional, Consult)
ii. 1803-1805 (Professional, ER)
iii. 2001-2013 (Professional, Inpatient Visit)
iv. 2401-2411 (Professional, Office Visit)
v. 2717-2719 (Professional, Home Visit)
vi. 2729-2731 (Professional, Domiciliary/Rest Home Visit)
vii. 2801-2807 (Professional, Preventive Medicine)

PCP Visits. PCP Visits include E&M visits rendered by a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Visits. Specialist Visits include E&M visits rendered by a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Referrals. A Specialist Referral is indicated using E&M visits and indicates the first instance of the Provider for an E&M service for that member. A specialist is a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

ER Visits. Indicates an ER service encounter. ER services are defined by a TOS_I value of Facility Outpatient, ER (801, 802) or Professional, ER (1803, 1805).

Radiology Services, Diagnostic. Radiology utilization is defined as an encounter for the following Types of Service:
-MRI/Cat Scans – Facility Outpatient (1201, 1203, 1204), Professional (2901, 2902, 2903)
-Other Diagnostic Radiology – Facility Outpatient, Diag. Radiology (1202, 1206, 1207, 1208), Professional, Diagnostic Radiology, Nuclear Medicine (2905 thru 2908)

Laboratory Services. Laboratory utilization is defined as an encounter for the following Types of Service:

i. Facility Outpatient, Lab (1001, 1003, 1005)
ii. Professional, Lab, (2101 thru 2118)
iii. Professional, Pathology (2501 thru 2511)

Pharmacy Services. A pharmacy service prescription record.

Inpatient Admits and Days. Number of unique inpatient stays. An inpatient stay describes the entire stay by a patient in a facility at the same level of care. Transfers to a different level of care at the same facility results in a new admission. Acute inpatient stays describe inpatient confinements in an acute care facility. Non-acute inpatient stays describe

inpatient confinements in a skilled nursing facility, transitional care unit/rehab, or other longer term/sub-acute facility. Inpatient days describe the difference between inpatient admission and discharge dates. Inpatient stays where the admission and discharge dates are equal are assigned one inpatient day.

If needed, provide specifications URL (preferred) or as an attachment:

URL:
Please supply the username and password:
Attachment: S9.7_RU_Categories-634387122122164241.xls

S9.8. Care Setting; ***provides information on which care settings the measure encompasses.***

Ambulatory Care : Ambulatory Surgery Center (ASC)
Ambulatory Care : Clinic/Urgent Care
Ambulatory Care : Clinician Office
Emergency Medical Services
Ambulance
Home Health
Hospice
Hospital/Acute Care Facility
Imaging Facility
Laboratory

S10.Adjustments for Comparability (Resource Use Measure Module 4)
External factors can mingle and affect or confound a measure's result. Confounding occurs if an extraneous factor causes or influences the outcome (e.g., higher resource use) and is associated with the exposure of interest (e.g., episode of diabetes with multiple co-morbidities). Measure developers often include steps to adjust the measure to increase comparability of results among providers, employers, and health plans.

S10.1. Risk adjustment method
Define risk adjustment variables and describe the conceptual, statistical, or other relevant aspects of the model and provide rationale for this methodology.

The attachment for S2 and responses to S8 above provided a description of the approach used by ETG to assign a severity score and level to each CHF episode. To do this, ETG first assesses the observed co-morbidities and condition status factors for an episode and the patient's age and gender. ETG then assigns a weight to each factor found to influence the relative risk of an episode of CHF. These weights and factors are condition-specific and were estimated using CHF episode results for a large population. The overall severity score for an episode is the sum of these weights for all factors observed. Using the severity score, a severity level is created, with each CHF episode assigned to one of four severity levels.

The approach used by ETG to assign episode severity has several advantages. First, the approach uses broad clinical profile of an episode, describing its clinical status and that of the patient. Second, the weightings assigned describe the incremental contribution of each factor to overall episode severity. Further, the approach used for severity is condition-specific – a separate model and weightings are constructed for each condition, including CHF. These severity results provide the key information required to support risk adjusted comparisons using CHF episodes.

Risk adjustment is an important step in resource use measurement. Measures of the cost of care for an organization or provider can be impacted by the underlying risk and severity of the patients they enroll or manage. Case-mix or risk adjustment addresses these differences and supports more consistent and equitable comparisons. These approaches allow a focus on differences in resource use deriving from differences in the practice of medicine rather than differences in the mix of episodes or patients.

The level of severity assigned by ETG to an episode is used to support risk adjustment. The risk adjustment approach includes three important steps:
-- Compute the observed experience for the provider being measured, across all episodes to be included in the

comparison;

-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peers benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed;

--Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The table in S10.1 provides an example comparing the cost of care performance of two cardiologists using episodes of care and the condition of CHF. The analysis used only complete, non-outlier CHF episodes. The upper section of the table summarizes results at the condition and severity level. A higher severity level for a condition indicates the presence of one or more condition status factors and/or co-morbidities that impact the resources required for treatment. The table also summarizes results for CHF, across all severity levels.

The table shows the number of episodes attributed to the cardiologist, the observed cost per episode, peers cost per episode (the "expected" amount), and the ratio of the cost per episode of the cardiologist to his peers. By condition and severity level, the peers cost per episode is the average experience of all cardiologists included in the measurement for those episodes. The peer's experience is risk adjusted and assumes the same mix of episodes (by condition and severity) as the physician being measured. Notice that for the overall CHF summary, the peers cost per episode for Dr. Jones is $2,081, while that amount for Dr. Smith is $1,841. The higher amount for Dr. Jones indicates a higher case-mix and greater expected costs relative to Dr. Smith. These peer amounts, adjusted for the specific mix of episodes observed for the physician being measured, capture the risk adjustment appropriate for the analysis.

In the last column, a relative cost ratio less than 1.00 indicates that the observed cost per episode for a provider is less than his peers. As shown, Dr. Jones cost is lower than peers and Dr. Smith is higher cost than peers. An additional report using the same measure information could summarize results by type of service, or specific utilization such as the use of a specific diagnostic test or treatment, providing greater insights into the factors behind differences in resource use. The risk adjustment for these measures would use the same approach as described here for total cost per episode.

If needed, provide supplemental information via a web URL (preferred) or attachment with the risk adjustment specifications.

URL:
Please supply the username and password:
Attachment: S10_Risk Adjustment Method Example-634387295828307122.xls

S10.2. Stratification Method
Detail the stratification method including all variables, codes, logic or definitions required to stratify the measure and rationale for this methodology

ETG stratifies episodes by the intensity of service, or total cost. For a given episode, a severity score is assigned based on demographic factors (gender and age) and the presence of co-morbidities and complications. The determination of this severity score is described in sections 8.3, 8.4 and 8.5. Once a severity score is determined, a severity level, a number between 1 and 4 is assigned based on a table that relates severity levels to severity scores for each ETG. The method for determining the severity levels is described in section 8.5. The severity level can then be used to stratify episodes by severity, measured as resource consumption.)

S10.3. Costing Method
Detail the costing method including the source of cost information, steps to capture, apply or estimate cost information, and provide rationale for this methodology.

The measure does not specify the specific costing method to be used for cost of care resource use measures. The

financial amounts used should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example

S11. Measure Reporting (Resource Use Measure Module 5)
The measure developer must determine which of the following Measure Reporting functions: attribution approach, peer group, outliers and thresholds, sample size, and benchmarking and comparative estimates, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

S11.1. Detail attribution approach
Detail the attribution rule(s) used for attributing costs to providers and rationale for this methodology (e.g., a proportion of total measure cost or frequency of visits during the measure's measurement period) and provide rationale for this methodology.

Attributing patients and episodes to appropriate physicians and groups is a challenging step in cost measurement. Over some period of time a patient can have multiple conditions and, in many cases, multiple providers caring for the same condition. For example, for an episode of hypertension, a patient can be managed by their primary care physician, an internist, and also receive services from a cardiologist. For a patient with coronary artery disease, an internist, a cardiologist, and a surgeon can all play a key role in providing the patient's care. A methodology is required to identify these episodes for a patient and the providers responsible for the services performed within those episodes. As a guideline, some principles are involved in determining a valid approach to be used in assigning episodes:
-- The approach must be valid conceptually. It must be defensible, understandable and accepted by providers, health plans, and other users of the measurement results;

-- The approach must be supported by readily available information, including the outputs from an episode grouping;

-- The approach should be robust across applications – working well for different sources of health plan data, patient populations and over time;

-- The approach should be flexible and consider the characteristics of the specialists being compared and the nature and severity of their patients and episodes;

-- Both activity-based and population-based approaches should be supported. An activity-based approach, describes attribution where an episode is assigned to the providers responsible for the greatest amount of activity during the course of the episode. Activity can be measured using different concepts including service costs, episode clusters, or patient visits.

A population, or panel-based approach is sometimes used when measuring performance for primary care physicians (PCPs), in particular where providers are performing a gatekeeper function for a population of members. In this case, responsibility for a member's qualified episodes of care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during those episodes.
-- "Sufficient" evidence of the provider's responsibility for the episode should exist. Thresholds should be considered that prevent providers from "winning" episodes where they have a small amount of involvement – relative to their physician peers or relative to all physicians involved in the episode.
-- Attributing the same episode to multiple providers in different specialties should be considered, when appropriate.

Care during an episode can include two types of services: services where important clinical decisions are made regarding the course of care and services that are a response to those decisions. Office visits, consultations and other evaluation and management services are examples of the first type of services. As part of these services, decisions to perform tests, prescribe drugs or order other ancillary services are made. The second type of service includes diagnostic lab, imaging, other tests, DME, drug therapies and treatments. These services are typically responses to decisions made regarding the course of care. Some services, such as surgery, may describe a closely linked bundle of care and relate to both categories – where the surgeon has some role in the decision to perform the procedure and also performs the

surgery itself.

The dichotomy above suggests two important concepts for assessing approaches to attribution. First, the measure of "activity" to be used in identifying a responsible provider should focus on those types of service where decisions regarding the course of care and management of the episode take place. Second, the decision on the approach to be used for attribution may differ by specialty. In the case of a group of providers such as surgeons, where the majority of their services may be of the second type – after the decision to undergo surgery has been made – using cost as the activity measure for attribution may make sense. However in the case of PCPs or medical specialists, non-acute E&M visits or the number of episode clusters (qualified services), may be a superior service activity measure for determining episode responsibility.
As a guideline, four different general options for physician episode attribution can be considered to attribute episodes to individual providers – three activity-based and one population-based approach. Each of these options can be supported using standard outputs from ETG and the measures described in this submission. For each option, the description below assumes the following steps have been performed prior to attribution:
-- ETG episode grouping – producing the detail and summary output files to be used in attribution and measurement;

-- Identification of the comparison peer group and the individual physicians to be included;

-- The selection of qualified episodes for the peer group. Qualified episodes include those episodes with an ETG that matches the pre-defined list to be used for that peer group. Qualified episodes are further limited to complete, non-outlier episodes that fall within the time period defined for measurement.

For this discussion, it is assumed that the objective is to assign a single winner, if possible, for each peer group in which the episode is relevant, but allow providers in different peer groups to be assigned the same episode. To support this, the following logic would be applied separately, peer group by peer group. The activity-based options are described first. Although these approaches are described for attribution at the individual physician level, they could also be applied using physician groups as the unit for attribution.

Approach 1 - Physician Episode Attribution using Professional Service Costs. This attribution approach identifies the responsible physician for an episode as that provider rendering the greatest amount of professional service costs during the episode.
Professional services are those performed by a clinician in managing and treating the patient during an episode of care, including visits and consultations, surgery and therapies. Professional services exclude inpatient and outpatient services billed by a facility and also typically exclude ancillary services, such as laboratory, imaging, DME, injectibles, medical and surgical supplies, transportation, pharmaceuticals, etc. One modification of the "professional services" to be used in this attribution approach that has been proposed by some is the use of information on the "ordering" provider, for a pharmacy prescription or diagnostic test. If available, this information could be used to extend the concept of services "rendered" by a professional provider. Some ETG users have assigned total costs for a cluster to the cluster provider as a way to extend this type of concept for attribution – the argument being that cluster ownership may suggest that the physician played an important role in the decisions to perform the ancillary services grouped to the cluster.
Using professional service costs for attribution involves the following steps:
-- For each qualified episode, sum the costs of all professional services grouped to that episode, by physician.

-- Identify those physicians with episode costs (if any) that are also included in the peer group being measured Disregard any episodes without one or more physicians for that peer group;

-- Identify the peer group physician with the greatest amount of total costs. If two or more peers are found to have the most costs, apply an appropriate "tie-breaker" to determine the winning physician (discussed below).
-- For each physician, compute their professional costs, as a percentage of costs for all clinicians for the episode and also as a percentage of all costs for all physicians in the peer group. These amounts can be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).

After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest amount of professional costs, is the responsible provider for that episode for that peer group.

Approach 2 - Physician Episode Attribution using Episode Clusters. This attribution approach identifies the responsible physician for an episode as that provider in the peer group owning the greatest number of "clusters" within the episode. As described in the attachment for S.2, other than the individual service, the cluster is the basic unit of an ETG episode.

Episode clusters are created using anchor records. Anchor records represent services provided by a clinician engaging in the direct evaluation, management or treatment of a patient. Office visits, therapies, and surgical procedures are examples. An anchor record indicates that a clinician has evaluated a patient's illness and has decided on the types of services required to further identify and treat the patient's condition. ETG links an anchor record with related services to form a cluster. Clinically homogeneous clusters are then combined to create episodes of care.
The clinical nature of an episode cluster makes it a natural candidate as an activity measure for episode attribution. In particular, the anchor records that define a cluster represent those types of service where decisions regarding the course of care and management of an episode take place. An additional benefit of episode clusters is that an anchor record service for a cluster can reside in another episode of care, but the cluster and cluster provider can still be identified for the episode of interest.
Using episode clusters for attribution involves the following steps:
-- For each qualified episode, sum the number of clusters "owned" by each clinician. The detail output file from ETG can be used for this purpose. For each service that can be assigned to an episode, the detail file identifies a unique cluster number and a cluster provider ID (same as the servicing provider ID for the cluster anchor record). Using this file, the unique cluster providers for an episode and the number of clusters each provider owns can be identified.

-- Identify those physicians with episode clusters (if any) that are also included in the peer group being measured. Disregard any episodes without one or more cluster providers from that peer group;

-- Identify the peer group physician with the greatest number of episode clusters. If two or more providers are found to have the most clusters, apply an appropriate "tie-breaker" to determine the winning provider (discussed below).

-- For each peer group physician, compute their number of clusters, as a percentage of clusters for all clinicians for the episode and also as a percentage of all clusters for all physicians in that peer group. These amounts can be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).
After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest number of clusters is the responsible provider for that peer group.

Approach 3 - Physician Episode Attribution using Non-Acute Evaluation and Management (E/M) Visits. This attribution approach identifies the responsible physician for an episode as that physician providing the greatest number of non-acute E/M visits within the episode.
Non-Acute E/M services include office visits and consultations and other E/M services that occur outside of an acute setting where a provider is managing patients and their care. For example, these services exclude initial and subsequent inpatient visits, inpatient consultations, ER visits and critical care visits. It includes office visits and consults, home visits, SNF visits, psychiatric evaluations and therapy and preventive services.
The clinical nature of these services makes them a logical candidate as an activity measure for episode attribution. In particular, these services represent encounters where decisions regarding the course of care and management of an episode take place. This subset of services will be narrower than that described by episode clusters.
Using non-acute E/M visits for attribution involves the following steps:
-- For each qualified episode, sum the number of non-acute E/M visits (visits) rendered by each clinician during the episode.

-- Identify those physicians with these visits (if any) that are also included in the peer group being measured. Disregard any episodes without one or more visit providers from that peer group;

-- Identify the peer group physician with the greatest number of visits. If two or more providers are found to have the most visits, apply an appropriate "tie-breaker" to determine the winning provider (discussed below).

-- For each peer group physician, compute their number of visits, as a percentage of visits for all clinicians for the episode and also as a percentage of all visits for peer group physicians. These amounts can then be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).

After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest number of visits is the responsible provider for that episode for that peer group.
Approach 4 - Physician Episode Attribution using a Primary Care, Population-based Approach. As noted above, a "population" or "panel" based approach is sometimes used when measuring performance for peer groups comprised of

primary care physicians. In particular, this approach is often considered where the PCPs are performing a gatekeeper function for a population of members. In this case, responsibility for a member's qualified episodes of care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during those episodes.
This approach requires two important steps:
-- Identification of a PCP for each member. This identification can often be obtained from the member's eligibility record which can include a notation of their assigned PCP for a period of time. Alternatively, a PCP can be "imputed" for a member based on that primary care specialist providing the greatest number of services or service costs for selected primary care. When imputing, the list of eligible providers is typically limited to those physicians involved in primary care. Using either approach, a member is linked to a PCP for a defined period of time.
-- For each qualified episode, identify the patient's assigned PCP during the episode period. Most users of this approach will select the member's assigned PCP at the beginning or ending date of the episode (episode begin and end date is available as part of the standard ETG output).
Using this approach, the peer group physician would be assigned all qualified episodes where they were determined to be the patient's PCP during the defined time period.

Physician Episode Attribution – Other Issues. Some general issues around episode attribution remain. The first involves tie-breakers. When using activity-based attribution for some episodes, two or more providers may have the same amount of costs, clusters or visits. In this case, a tie-breaker is often applied to determine the responsible physician for the episode. Useful candidates for this purpose are the alternative activity measures described here. For example, if two physicians own the same number of clusters within an episode, the physician with the greatest amount of professional services costs could be selected. If a tie still remains, the physician with the greatest number of visits could be chosen, and so on.
A second issue involves setting appropriate thresholds to determine sufficient activity. As noted above, most activity-based attribution approaches involve some screening of the winning provider to ensure that they owned sufficient activity relative to their peers and to other providers during the course of the episode. This is typically done using two threshold comparisons – a provider's percentage of the total activity of peers and a provider's percentage of the total activity described by all clinicians for the episode. This percentage is then compared to a predefined threshold(s). For the physician with the greatest activity, if their percentages exceed both of these thresholds, they are determined to be responsible for the episode.
As an example, for an episode with 10 clusters, Dr. Jones is responsible for 2 of the 10 clusters and 8 other physicians are responsible for 1 cluster each. Even though Dr. Jones has the most clusters, he still may not be assigned the episode because his involvement was very small.
Most users set these thresholds at 25 or 30 percent. For example, the winning provider must own 25% or more of all of the episode clusters owned by peers and 25% or more of all episode clusters owned by all clinicians.
As a final point, it is useful to summarize the issues around allowing an episode to be attributed to multiple providers. As noted above, many ETG users who employ episode results to support physician measurement perform attribution separately for each specialty peer group of interest, including primary care. In doing this, they select a single winner, if possible, for each peer group in which the episode is relevant, but allow providers in different peer groups to be assigned the same episode, if attribution requirements are met.
In this way, it is theoretically possible to assign more than one physician to an episode if each peer group is considered separately. Users typically do not assign two physicians from the same peer group to the same episode.
To support multiple attribution across peer groups, users would repeat the attribution step selected from above separately for each peer group. Those physicians both meeting the dominant provider status for their peer group and also exceeding the threshold requirements could be responsible for the episode.

S11.2.Identify and define peer group
Identify the peer group and detail how peer group is identified and provide rationale for this methodology

Guidelines : Peer groups define the group of physicians being compared. For example, a common practice in physician episode measurement is to assess the actual costs for those episodes attributed to an individual physician or practice and compare actual costs to peer results, risk adjusted to support more valid comparisons. The peer values use in these comparisons will be influenced by the selection of providers included in the peer group.

In defining a peer group for cost of care measurement, most organizations will include physicians from the same specialty or area of expertise. For organizations with a network covering broad geographic area, some distinction by provider geography can also be used. Internal medicine, cardiology, or general surgery within a certain geographic area

are examples of a peer group. Although not directly related to defining a group of providers as peers, many organizations provide separate measurements by line of business, separating results and peer comparisons by commercial, Medicare and Medicaid products.

S11.3. Level of Analysis:

Clinician : Group/Practice
Clinician : Individual
Clinician : Team
Facility
Health Plan
Integrated Delivery System
Population : Community
Population : County or City
Population : National
Population : Regional
Population : states

S11.4.Detail measure outliers or thresholds
Detail any threshold or outlier rules and decisions based on measure resource use and provide rationale for this methodology

Guidelines : Outlier episodes – as a guideline, low outlier cost episodes should be excluded from resource use measurement. High outlier cost episodes should be included, but all costs truncated at the high outlier cost threshold used for the episode (a technique called "winsorization"). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier episode.

S11.5.Detail sample size requirements
Detail the sample size requirement including rules associated with the type of measure

Guidelines : The choice of sample size is less important using techniques that include statistical methods that find only statistically significant difference. If your choice of sample size is low, you will not find many cases that are statistically significantly different. A sample size of 30 is chosen because this is when the normal distribution is a good approximation of the student's t distribution. However, the choice of sample size is less critical when using tests of statistical significance.

S11.6.Define benchmarking or comparative estimates
Detail steps to produce benchmarking and comparative estimates and provide rationale for this methodology

Guidelines : The response to section S10.1 includes examples on how to compare the results for a physician with that of their peers or with external best practice benchmarks. As a guideline, in making comparative estimates, the following considerations should be made:

-- As described in S10.1, comparative results should be risk adjusted to support more valid comparisons;

-- Differences in fee schedules and contracts – for some comparisons using cost of care, differences between actual practice and the benchmark can be influenced by different unit pricing assumptions. In these cases standard pricing or general adjustments to cost levels can be made; and

-- Practice styles and service utilization can differ between geographic areas and also between physicians in different specialties. Although comparisons across areas and specialties can provide insights, proper care should be taken in interpreting and communicating results.

S12.Type of Score:

Continuous variable

Count
Rate/Proportion
Ratio

If available, please provide a sample report:

S12_sample_score_report_EPI-634387296021589609.pdf

S12.1. Interpretation of Score.
(Classifies interpretation of score (s) according to whether higher or lower resource use amounts is associated with a higher or lower score, a score falling within a defined interval, or a passing score, etc)

The measures described in this submission include continuous cost measures, counts of utilization, rates and proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons.

For the continuous cost per episode measures (also a rate), an increase in costs can be interpreted as an increase in the resources used to diagnose, manage and treat the episodes in question. This score provides a representation of the weighted utilization expended, where the weights are based on the cost assigned to each individual service.

For the counts of utilization measures per 1,000 episodes (also a rate), an increase in utilization can be interpreted as an increase in the resources used to diagnose, manage and treat the episodes in question. This score provides a representation of un-weighted utilization. Counts of utilization measures are most useful when the services being aggregated are similar (e.g., inpatient admits, E&M visits, MRI services).

The risk adjusted observed to expected cost or utilization ratio (O/E ratio) includes three important steps:
-- Compute the observed experience for the provider being measured, across all episodes to be included in the comparison;

-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peers benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed;

-- Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The O/E ratio (relative resource use ratio) can be interpreted based on its magnitude and relationship to a peer average or other guidelines. A relative cost ratio less than 1.00 indicates that the observed resource use per episode for a provider is less than his peers. A relative cost ratio greater than 1.00 indicates that the observed resource use per episode for a provider is greater than his risk adjusted peers.

S12.2. Detail Score Estimation
Detail steps to estimate measure score.

The measures described in this submission include continuous cost measures, counts of utilization, rates and proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons. The continuous cost measures, counts of utilization, and rates per episode are described in detail in S9.5. The details involved in computing the O/E ratio measure is provided in S10.1.

S12.3. Describe discriminating results approach
Detail methods for discriminating differences (reporting with descriptive statistics--e.g., distribution, confidence intervals)

In all of these measures we end up with an O/E ratio for a provider. In order to determine the statistical accuracy of this measure we start by measuring the variance of this metric:
Var(O/E)

The Variance of this metric has been estimated by the following expression in a number of journal articles :
Var(O/E)=(Sum(Var(Oi))/[Sum(Ei)]2
Where Var(Oi) is the variance for each of the physician's episodes across all episodes in it's statistical unit for the peer group.
Then the standard error (SE) for this measurement is Sqrt(Var(O/E).
Finally, a 95% confidence interval could be calculated by:
(O/E-1.96*SE, O/E+1.96*SE)
Alternatively, a 90% confidence interval could be calculated by: (O/E-1.64*SE, O/E+1.64*SE)

Adams et al. BMC Health Services Research 2010, 10:57 http://www.biomedcentral.com/1472-6963/10/57

TESTING/ANALYSIS	
Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. See guidance on measure testing.	**Eval Rating**
TESTING ATTACHMENT (5MB or less) or URL: ***If needed, attach supplemental documentation (Save file as: SA_Reliability_Validity Testing) All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.*** URL: Please supply the username and password: Attachment: SA_Reliability_Validity Testing_CHF.xls	
SA1. Reliability Testing ***For each module tested or for the overall measure score:*** **SA1.1. Data/sample** ***(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)*** Data used to support validity testing is based upon a National Commercial member health care services benchmark database representing more than 25 million covered lives for calendar year 2009. Various permutations of the 25 million unique members are pulled to support testing initiatives, for example: -4 million member sample used for face validity evaluation of ETG processing -7 million member sample used for reliability evaluation of ETG processing and associated Resource Utilization measures -75,000 member sample, with manipulated data for content validation testing of ETG processing and associated Resource Utilization measures **SA1.2. Analytic Methods** ***(Describe method of reliability testing and rationale)***	**2a2**
Reliability refers to the consistency of a measure. A measure is considered reliable when the same result is produced repeatedly. Reliability of ETGs and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of a benchmark database of member and health care services covering more than 25 million lives as described in SA1.1. The second level of internal consistency reliability involves detailed parallel processing comparisons between ETG and Resource Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and	**H☐** **M☐** **L☐** **I☐**

maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios.

SA1.3.Testing Results
(reliability statistics, assessment of adequacy in the context of norms for the test conducted)

The extensive testing of ETG produces volumes of results across the test cases and other concepts described above. In terms of validity and assessing the reliability of the implementation, testing of the measurement software with the parallel SAS prototype involves iterations until a high degree of matching of results is observed (over 99.9%). The statistic used in this testing is the exact match of the grouping of records and assignment of resource measures. The difference in the result for each measure between the methodology and prototype is calculated and differences equal to zero are considered an exact match.

In terms of testing of measures across organizations, the following results provide examples of consistency for the submitted measures. These data were not standard priced, so some observed variation is the result of differences in fee schedules and contracts between the organizations. A table, "Reliability Across HCOs" is included in the attachment for SA (SA_Reliability_Validity Testing). The table shows measures of resource use for nine healthcare organizations (HCOs) (columns) with a separate comparison provided for selected resource use measures included with this submission. (The 7 million member sample from 9 health care organizations used for reliability assessment described in SA1.1). The results include combined findings across all severity levels for the base condition, with results risk adjusted to reflect the same mix of episodes by severity level across each organization. Separate results are shown for relevant peer groupings (e.g., internal medicine, cardiology). These peer group results are based on episode attributed to each provider, with the estimates describing the peer level findings across all physicians and episodes included in the measurement. As shown, the results suggest a level of consistency across health plans implying reliability in both the measure specification and how it can be applied to different organizations.

A further assessment of reliability and face validity can be made using measure results attributed to physicians in different specialties. The tables, "Results Across PeerGrps, Cost" and "Results Across PeerGrps, Utils" included in the attachment for SA (SA_Reliability_Validity Testing). Provide a comparison of the cost and use per episode for episodes attributed to different specialties. The tables also show results by episode severity level, supporting an assessment of how cost and use measure results vary as severity level increases. The results also show a strong relationship between episode severity and resource use.

SA1.4.Finding statement(s)—*(i.e., is the measure deemed reliable, limitations identified)*

As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies.

SA2.Validity Testing
For each module tested or for the overall measure score:

2b2

SA2.1. Data/Sample
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Different samples of data are used in testing ETG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-4 million member sample used for validity and reliability of the ETG methodology and the software used for ETG processing;

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-250,000 member sample, with manipulated data for content validation testing of the post-ETG processing associated with Resource Utilization measures (measures described in S9.5);
-7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA2.2.Analytic Method
(Describe method of validity testing and rationale; if face validity, describe systematic assessment)

Also, please see our responses to SA1 which relate to both reliability and validity.
Validity determines if the output of the measure is accurate. The measure must be valid in order for the results to be accurately applied and interpreted. Validity of a measure is not determined by a single statistic, but by evaluating the complete result of the measures and demonstrating the relationship between the result and the intended purpose of the measure. Validity of ETGs and Resource Use Utilization Measures are judged based upon both content validity and face validity.

Content validation testing involves detailed parallel processing comparisons between ETG and Resource Use Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing valid results using a variety of processing configuration options and data input scenarios.

The face validity approach assesses if the measure result is reasonable and functioning according to expectations. This form of validation is most typically performed when modifications to the methodology intentionally change the result of the measure. When this occurs a pre- and post-modification parallel run is created and changes in the measure output are validated for accuracy at face value. Episodes are evaluated for validity in terms of distribution of ETGs, Episode Types, Record Types, Outlier Status and Type of Service. Resource Utilization Measures are evaluated for validity in terms of measure Cost per Episode by Peer Group as well as overall evaluation of the utilization measures by Peer Group.

SA2.3.Testing Results
(statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment)

Please see our responses to SA1 which relate to both reliability and validity.

SA2.4. Finding statement(s)—(*i.e., is the measure deemed reliable, limitations identified)*

Please see our responses to SA1 which relate to both reliability and validity.

SA3.Testing for Measure Exclusions **2b3**

SA3.1. Describe how the impact of exclusions (if specified) is transparent as required in the criteria

ETG includes logic to identify high or low cost outliers at the episode level. In particular, ETG has a comprehensive method for identifying outlier episodes where the resource cost is high or low enough relative to norms for the clinical condition to distort the results. A table of thresholds, or "trim points", is used to describe levels of costs considered extremely high or low relative to the norm. Specific trim points are defined for each base condition (e.g., CHF) and also for each level of severity and the presence of surgical treatments. These values have been determined using a benchmark database describing the experience of more than 25 million covered lives. Note that severity of illness and treatment indicators are assigned as described in the general methodology paper on ETG included in the response to S2. Low and high outlier episodes are noted by ETG.

As described in the general methodology paper on ETG (included in the response to S2), ETG considers an episode incomplete if the clean period of the episode overlaps with the boundaries of the overall time period being used for measurement (e.g., calendar years 2009 and 2010) or the member's eligibility start and end dates. Incomplete episodes

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may have either an unknown start or an unknown finish. ETG clean periods are described in detail in the general methodology paper on ETG (see S2 response). To summarize, clean periods describe the amount time before and after an episode where clinical activity related to the episode is assessed to determine episode completeness. If no relevant clinical activity is observed and the clean period does not overlap with the overall analytic time period begin and end dates or the member's eligibility begin and end dates, the episode can be considered complete. Different rules are applied to acute and chronic episode conditions to do this. Complete and incomplete episode status and type are noted by ETG.

It is recommended that incomplete episodes be excluded from resource use measurement and comparisons. It is recommended that low outlier cost episodes be excluded from resource use measurement. It is recommended that high outlier cost episodes be included in resource use measurement, but truncated at the high outlier trim point.

In terms of resource use measure construction following ETG grouping, no additional data inclusion or exclusion are applied. Only condition episodes are included in the measurement of episode-based resource use for that condition, including the individual services that ETG groups to those episodes. As noted, it is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated as described above.

SA3.2. Data/sample for analysis of exclusions
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Different samples of data are used in testing ETG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-4 million member sample used for validity and reliability of the ETG methodology and the software used for ETG processing;
-250,000 member sample, with manipulated data for content validation testing of the post-ETG processing associated with Resource Utilization measures (measures described in S9.5);
-7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA3.3. Analytic Method
(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference)

Reliability and testing of exclusions for ETGs and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of the benchmark described above in SA2.1.

The second level of internal consistency reliability for exclusions involves detailed parallel processing comparisons between ETG and Resource Use Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios.

As an example, the text below provides the Table of Contents for an ETG testing plan for ETG Version 7.0. The plan includes processes around data used, test cases created, comparison of software results with those produced by a SAS prototype (to determine matching across parallel implementations of the methodology), and a review by clinical analysts to assess face validity. A similar testing approach is used for the resource use measures that are processed

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following ETG grouping. Note that steps 2.4 and 2.5 relate to exclusions around episode completeness and outlier status.

ETG TEST PLAN DOCUMENT – EXAMPLE TABLE OF CONTENTS
SECTION 1—OVERVIEW
1.1 PURPOSE OF TEST PLAN DOCUMENT
1.2 TESTING APPROACH AND DELIVERABLES
1.3 SCOPE OF TESTING
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2.5 DISTRIBUTION BY OUTLIERS
2.6 EPISODE AGE/GENDER PROFILE
SECTION 3—FEATURE-RELATED TEST CASES
3.1 COMPARISON OF SOFTWARE TO PROTOTYPE
3.2 SEVERITY ADJUSTMENT
3.3 COMPLICATIONS
3.4 COMORBIDITIES
3.5 TREATMENT INDICATORS
3.6 EPISODE INDICATORS
SECTION 4—REVISION HISTORY

Finally, the results are applied to the healthcare data of different organizations to assess both the ability of the organization's data to support the measurements and also the consistency of results across the organizations. This assessment of reliability also provides evidence that the measures are being applied in a consistent and valid way.

SA3.4. Results
(statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses)

See Attachment SA_Reliability_Validity Testing for a comparison of episode outlier and completion results across sources of data from ETG processing.

SA3.5. Finding statement(s)-- *(i.e., is the measure deemed reliable, limitations identified)*

As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies. This statement applies to all methodologies involved, including exclusions.

SA4. Testing Population
Which populations were included in the testing data? (Check all that apply)

Commercial

SA5. Risk adjustment strategy — **2b4**

Refer to items S10.1 and S10.2 to rate this criterion.

H☐ M☐ L☐ I☐

SA6. Data analysis and scoring methods — **2b5**

Refer to items S12-S12.3 to rate this criterion.

H☐

	M☐ L☐ I☐
SA7. Multiple data sources ***Refer to S7 & all SA1 items to evaluate this criterion.***	**2b6** H☐ M☐ L☐ I☐ NA☐
SA6. Stratification of Disparities (if applicable) ***Refer to item S10.2 to rate this criterion.***	**2c** H☐ M☐ L☐ I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties*?	
Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met? **Rationale:**	Y☐ N☐
USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.	**Eval Rating**
Meaningful, Understandable, and Useful Information **U1. Current Use:** Internal quality improvement Payment Public reporting (disclosure to performance results to the public at large) Quality improvement with external benchmarking **U1.1. Use in Public Reporting Initiative Use in Public Reporting.** ***Disclosure of performance results to the public at large (If used in a public reporting program, provide name of program(s), locations, Web page URL(s). If not publicly reported in a national or community program, state the plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement)*** Several users of ETGs and Resource Use Measures rely on the analysis to support Public Reporting initiatives. Examples include: -- Health Care Organization #1: Measuring Provider Efficiency -- HCO #1 ranks providers based on efficiency by ETG using a single provider ETG overview. Using COGNOS reporting capabilities the organization is able to drill down into procedure and drug level comparisons. -- Health Care Organization #2: Corporate Wellness Programs -- HCO #2 uses ETG output to analyze utilization patterns and identify potential diseases and populations to target for intervention. ERGs are used to adjust the average and comparison population expenditures and Specialty profiles are created using both ETG and ERG results. ERG scores are used to identify patients who could be potential high utilizers. -- Health Care Organization #3: Physician Profiling and Clinical Benchmarking -- HCO #3 has embarked upon an initiative to use ETG information for clinical reporting and benchmarking. ERG output complements the ETG information for underwriting and physician profiling programs as well. -- Health Care Organization #4: Provider Specialty Profiling and Predictive Modeling	**3a** H☐ M☐ L☐ I☐

-- HCO #4 utilizes Resource Use Measures and ETG to identify variations in practice patterns, measure performance and examine utilization and disease management. The primary focus is on high cost specialties and ETGs are used to identify the top 5 conditions to support specialty profiles and cost comparisons and drill downs. ERG scores are used to risk adjust PCP profiles to adjust for patient severity.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request.

U1.2. Use in QI
(If used in improvement programs, provide name of program(s), locations, Web page URL(s)).

Examples of ETGs and Resource Use Measures in action within health care industry quality improvement initiatives include:
-- Health Care Organization #5: Internal Quality Improvement – Disease Management
-- HCO #5 utilizes 30 months of medical and pharmacy data totaling more than 17 million claim lines to support identification of member risk and stratification of members for care management teams. ETG and ERG groupers are embedded within their claims datamart with other sources of data and support the identification of clinical care gaps and impactable dollars for quality improvement.
-- Health Care Organization #6: Employer Group Utilization Reports to Identify Provider Variance
-- HCO #6 generates Employer or Account Group Utilization Reports which includes a global view of ETGs for the population. These reports are used to identify the top 5 ETGs where variance is the greatest to target specific procedures for a particular ETG in order to improve quality for the Employer group.
-- Health Care Organization #7: Cesarean Section Study
-- HCO #7 conducted a study on Cesarean Section, Infertility and multiple births using ETGs. Providers with high rates of Cesarean Section were identified and compared based upon severity indices. The study determined that multiple births were a significant contributor to a market's cost and procedure variances. The study further identified infertility treatment specialists who need improvement based upon the comparison to their peers of best practices and procedures.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request.

U1.3. Use for other Accountability Functions (payment, certification, accreditation)
(If used in a public accountability program, provide name of program(s), locations, Web page URL(s).

Other examples of industry use of ETGs and Resource Use Measures include Provider Pay for Excellence programs and Member Cost Analysis Tools. Specific examples include:
-- Health Care Organization #8: Provider Analytics Team
-- HCO #8 leverages the power of ETGs and Resource Use Measures to support their internal Provider Analytics team. This team manages the Provider Profiling program to support the Medical Directors' high-level physician review and network physician meetings as well as bi-annual provider profiling reports. In addition to provider profiling the Provider Analytics team uses ETG and Resource Use Measures to Impute PCP information to identify gaps in care, support physician group award programs and Patient Centered Medical Home projects.
-- Health Care Organization #9: Member Cost Analysis Tools
-- HCO #9 has created a patient website with cost calculation tools to provide detailed treatment costs for the patient based upon ETG analysis. The website includes tips on how to reduce costs as well as a pharmacy co-pay calculator. Users may access median cost reports for an ETG as well as cost ranges for procedures based upon CPT codes, pharmaceuticals and office visits. The website also provides comparison data for providers based upon performance indices.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request

U2. Testing of Interpretability **3b**
(Provide a rationale for why the measure performance results are meaningful, understandable, and useful to the intended audience(s) for both public reporting and quality improvement).

U2.1. If understanding or usefulness was demonstrated **H☐ M☐ L☐**
(e.g., through systematic feedback from users, focus group, cognitive testing, analysis of quality improvement initiatives) describe the data, methods, and results.

The assessment of the usability of the results from ETG-based measures of resource use is primarily from two entities: the ETG Medical Advisory Board and the Ingenix User Forums around these measures. The Medical Advisory Board is comprised of medical directors from healthcare organizations that employ episode based measures to assess resource use. Input and feedback from these clinicians inform both the ETG methodology itself and also how it is used in creating and sharing provider measurement results. The Ingenix User Forums include technical experts from organizations that use ETG. Similar to the Medical Advisory Board, input and feedback from this group informs the ETG methodology, but primarily is focused on how ETG results are used to create and share provider measurement results.	**NA☐**
U2.2. Resource use data and result can be decomposed for transparency and understanding. ***Refer to items S11 -S12.3.***	**3c** **H☐** **M☐** **L☐** **I☐**
U3. If there are similar or related measures (either same measure focus or target population) measures (both the same measure focus and same target population), list the NQF # and title of all related and/or similar measures. **U3.1. If this measure has EITHER the same measure focus OR the same target population as NQF-endorsed measure(s): Are the measure specifications completely harmonized?** **U3.2. If the measure specifications are not completely harmonized identify the differences, rationale, and impact on interpretability and data collection burden.** ***Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)***	**3d** **H☐** **M☐** **L☐** **I☐** **NA☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?	
Steering Committee: Overall, to what extent was the criterion, *Usability*, met? **Rationale:**	**H☐** **M☐** **L☐**
FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement.	Eval Rating
F1. Data Elements Generated as Byproduct of Care Processes ***How are the data elements needed to compute measure scores generated? Data used in the measure are:*** Generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims)	**4a** **H☐** **M☐** **L☐** **I☐**

F2. Electronic Sources ***Are the data elements needed for the measure as specified available electronically? (Elements that are needed to compute measure scores are in defined, computer-readable fields)*** ALL data elements in electronic claims **F2.1. If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.**	**4b** **H☐** **M☐** **L☐** **I☐**
F3. Susceptibility to Inaccuracies, Errors, or Unintended Consequences ***Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to minimize or prevent. If audited, provide results.*** The main source of inaccuracies relate to small sample size. There are lower limits on the number of episodes for a given provider or specialty that are allowed for inclusion in the analysis. Sample sizes that are determined to be too small are eliminated from the analysis. These situations will occur infrequently, as the sample sizes that are customarily dealt with are very large. A methodology for applying statistical techniques to determine confidence intervals of the results has been created and can be applied to gauge the accuracy of the analysis. In addition, sample size is less of an issue when multiple episode types are combined for a single metric. In some cases, there are physicians that are "ultra" specialized that may not have a reasonably sized peer group for comparison. Sub-specialties like hepatology, or muscular dystrophy specialists may fall into this category.) A second source of potential inaccuracies relate to the validity and completeness of the administrative data available to support the measurement. As described in S6.1, a careful evaluation of the data to be used to support the measurement is required and actions taken to address identified issues.	**4c** **H☐** **M☐** **L☐** **I☐**
F4. Data Collection Strategy ***Describe what you have learned/modified as a result of testing regarding barriers to operational use of the measure (e.g., availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, cost of proprietary measures).*** The measure is in use beyond internal QI. Please see the section on Usability. If needed, we can send you the NDCToDCC.zipx file.	**4d** **H☐** **M☐** **L☐** **I☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility*?	
Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met? **Rationale:**	**H☐** **M☐** **L☐**
RECOMMENDATION	
Steering Committee: Do you recommend for endorsement? **Comments:**	**Y☐** **N☐** **A☐**
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Co.1 Measure Steward (Intellectual Property Owner)	

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Co.6 Additional organizations that sponsored/participated in measure development

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.2 Year the measure was first released:

Ad.3 Month and Year of most recent revision:

Ad.4 What is your frequency for review/update of this measure?

Ad.5 When is the next scheduled review/update for this measure?

Ad.6 Copyright statement/disclaimers:

Ad. 7 Date of Submission (*MM/DD/YY*)**:**

04/18/2011

INGENIX

ETG METHODS DOCUMENT
Building Episodes with Episode Treatment Groups (ETG): General Methodology and Application for CONGESTIVE HEART FAILURE (CHF)

This document provides an overview of the Ingenix Episode Treatment Groups (ETG) methodology and its application for creating CHF episodes of care. ETG groups individual medical and pharmacy services to unique episodes of care defining a condition for a patient and is used extensively to support episode-based measurement of cost of care. The first section of this document describes the general approach used by ETG. The second section beginning on page 11 summarizes methods for CHF.

I. Episode Treatment Groups (ETG) Construction Logic

ETG is an episode grouping methodology that identifies a unique clinical condition for a patient and the services involved in diagnosing, managing and treating that condition. ETG organizes routinely-collected professional, inpatient, outpatient and ancillary services, including pharmaceutical services, into episodes of care. ETG evaluates each claim service record with respect to provider type, procedure and diagnoses codes and other information to assign the record to an appropriate episode. In doing this, all conditions and episodes are considered for a patient, including concurrently occurring conditions.

ETG covers the breadth of clinical medicine. Examples of ETG based conditions include diabetes, asthma and chronic sinusitis. Each episode is further assigned a condition-specific severity level, supporting case-mix adjusted comparisons within and across conditions.

ETG uses as input data information from administrative medical and pharmacy claim service records and encounters describing the individual services provided to a patient. ETG also uses information describing each patient, including age and gender and time enrolled with a health plan or other organization.

The Episode Building Process

The ETG episode building process has four important steps:

1. Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
2. Build Episodes from Anchor Records
3. Group Non-Anchor Records to Episodes
4. Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

Step 1: Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures

Assign record type to each Service

In building an episode the first step involves assigning a Record Type to each service record. The Record Type assigned to a record is determined by the Provider Type, Procedure Code and/or Revenue Code Service, and National Drug Code (NDC) (if any), on the record. Provider Type values are based on the mapping of individual provider specialties to one of three values recognized by ETG: Clinician, Facility and Other. The Provider Type values and their definitions are as follows:

Provider Type	Definition
Clinician	Providers who make diagnoses and recommend treatment
Facility	Acute and long term care providers such as short-term hospitals, skilled nursing facilities, and psychiatric or chemical dependency facilities
Other/Non-Clinician	All other healthcare providers

Identify Anchor Records

Service records containing a NDC code are assigned a Pharmacy Record Type. For other services, ETG assigns one of the following Record Types to the service record using Provider Type and the procedure/revenue code and also determines if that Record Type can anchor (begin or continue) an episode. The following table describes the Record Type and Anchor relationship:

Record Type	Record Type Value	Anchor or Non-Anchor
Management	A record submitted by a clinician for services related to the evaluation of a patient's condition.	Anchor
Surgery	A record submitted by a clinician for surgical or related procedures.	Anchor
Ancillary	A record submitted by any provider for laboratory, radiological or similar services.	Non-Anchor
Facility	A record submitted by a treatment facility for room & board services.	Anchor
Pharmacy	A record for a prescription drug service.	Non-Anchor

Most management records contain evaluation and management CPT-4 codes. Surgery records are primarily procedural CPT-4 codes. Facility records are room and board revenue codes billed by a facility (also referred to as a confinement). Pharmacy records are claims containing a NDC or certain HCPCS codes related to the administration of a drug. Record Types of management, surgery and facility are considered *anchor* records. The identification of an anchor record is significant because it indicates that a clinician has evaluated a patient, and has decided on the types of services required to further identify and treat the patient's condition. Non-anchor records describe *ancillary* services that aid in evaluating and treating the patient, such as x-rays and laboratory services.

Assign Diagnoses to Diagnosis Class

The way in which records are grouped to an episode is governed mainly by the diagnosis, revenue, and procedure codes on the service record. Each ICD-9-CM, CPT-4/HCPCS, and revenue code has been mapped to ETG concepts through extensively vetted and continually updated clinical tables. (ICD-9 procedure codes are not used in grouping.)

Diagnosis Codes

The software relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG.
- Sign and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition.

The software runs one member at a time and processes the anchor records with a 365-day moving window. The diagnosis codes are grouped in several distinct passes. This is done so that the grouper

processes the more specific codes first, leaving the sign & symptom codes until later, when it is more likely that there is a more specific episode for these claims to join.

Each diagnosis code is matched with one or more ETGs through a diagnosis eligibility table. The exception is 'E' codes which are not grouped. Each diagnosis code is further ranked, based on its strength of association with the ETG. The rank values are as follows: low, medium, high and primary. Low, medium, and high represent the strength of the match association. A primary rank describes conditions that define a disease and are the main codes that impact grouping decisions. The grouper first processes the specific and non-specific diagnosis codes so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to.

Identify the Clinical Relationship Between Diagnosis Codes and Conditions

Match each diagnosis code with one or more conditions (ETGs) through a diagnosis eligibility table. In addition to mapping diagnosis codes to conditions, each diagnosis code is further ranked, based on its strength of association with a condition. A rank of "primary" or "incidental" is assigned to each diagnosis and condition combination, with a further ranking assigned to incidental relationships:

- Primary: A "primary" diagnosis/condition relationship is assigned in a map where the diagnosis defines that condition. (Note: the word "primary" here is used to describe the relationship between a diagnosis and an episode, it is not used to indicate the position of the diagnosis code on the claim line. The diagnosis in any position on the claim line can have a primary relationship with an ETG). This map is used to identify primary diagnoses for the ETG. Primary diagnosis codes can only be ranked as primary for a single ETG condition.

- Incidental: These diagnosis codes are eligible for a condition but are not classified as primary. These diagnosis codes can be incidental to other conditions. To support the linkage of these diagnosis codes to a final episode, a further ranking is assigned for each condition based on the relative strength of association between the diagnosis and condition. Values of low, medium, or high are assigned for each diagnosis/condition.

Identify Relationships between Procedure Codes and Conditions

In building episodes, the procedure or revenue code can help to identify the ETG to which a particular claim record can be assigned. A given procedure may be valid for several ETGs, though not equally so. A procedure eligibility table therefore ranks the valid ETGs for each procedure to give a better sense of how closely related the service is to each ETG. The ranking options are: Very Low, Low, Medium, and High, with High being the strongest rank.

The following table provides an example of a rhinoplasty surgical procedure and selected ETGs it is eligible for and the rank for each ETG.

ETG	Rank
Trauma to ear/nose/throat	High
Other inflammatory conditions of ear/nose/throat	High
Allergic rhinitis	Medium
Chronic sinusitis	Medium
Trauma of oral cavity	Medium
Open fracture or dislocation - head & face	Medium
Congenital & acquired anomalies of ear/nose/throat	Medium
Closed fracture or dislocation – head & face	Low
Cocaine or amphetamine dependence	Very Low
Other disorders of ear/nose/throat	Very Low

For a record to be eligible to start or join an episode, the diagnosis code and the procedure/revenue code must both be eligible for an ETG. Where an anchor record can be assigned to more than one observed

episode for a patent, the record is assigned to an episode according to the best combination of the procedure/revenue code and the diagnosis code.

- The ETG Online Clinical Knowledge Base application on the Ingenix website (www.ingenix.com/transparency) provides more information about the diagnosis and procedure associations to an ETG.

Identify Relationships Between Pharmacy Services and Conditions

The relationship between pharmacy services and episodes is based on the pharmacy code assigned to the service in a mapping. To support this assessment, the ETG methodology assigns each pharmacy service to a Drug Category Code (DCC). The DCC describes the drug's active ingredients and route of administration. DCCs are then mapped to ETGs and define the relationships between a drug and a condition. Most pharmacy services are defined using NDC procedure codes, however selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC by ETG (e.g., J-codes describing injections).

Step 2: Build Episodes from Anchor Records

Only anchor records can start or continue an episode.

Anchor records can do the following:

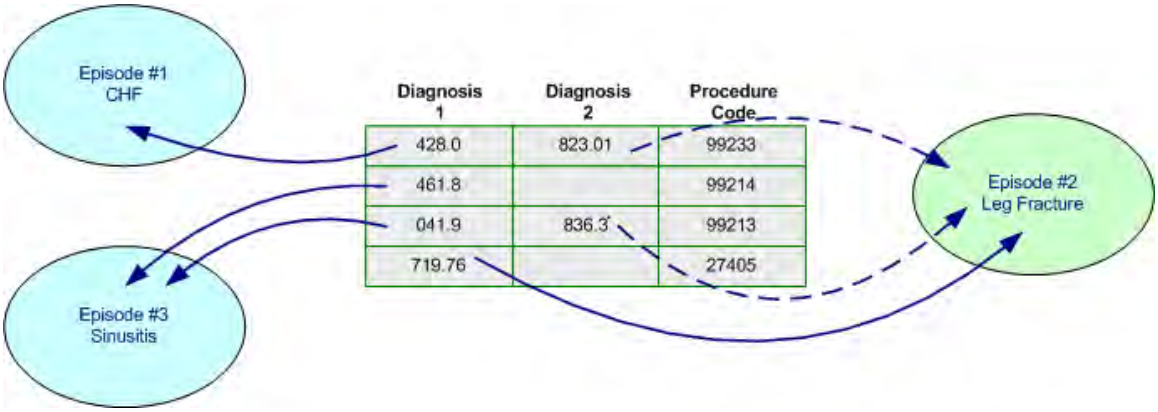
- Begin a *cluster* that can open a new episode or join an existing episode
- Extend an episode (time-wise) – providing evidence that the episode has not yet completed
- Create one or more or *phantom* clusters – when there are multiple diagnosis codes on the same anchor record
- Determine if episodes incur complications, comorbidities and significant surgery/treatment

Each anchor record forms a cluster. A cluster is the basic unit of an episode. Each cluster is comprised of an anchor record and zero, one, or more ancillary and pharmacy records. Each episode consists of one or more clusters. The illustration below demonstrates this concept, showing management (M), ancillary (A) and pharmacy (P) records within clusters.

Clusters: Real and Phantom

Once the anchor record has been assigned to an episode using a diagnosis, the remaining diagnosis codes on the record, if any, are examined. If a remaining diagnosis would more appropriately belong to a different episode than the episode the anchor record is assigned to, the software starts a phantom cluster for a new episode. At this point, phantom clusters are episodes created that will not have any costs assigned to them. Subsequent service records for a patient will now have available additional episodes for potential grouping, so the software will be able to assign these subsequent services more accurately than it would without using phantoms. This allows the diagnostic information to be utilized fully to identify and track all of the conditions for

which the member is being treated, yet still assign records to only one episode. The diagram below provides an illustration. The dotted line indicates a phantom episode was started, a straight line indicates a real episode was started. In the case of diagnosis code 719.76, it joined episode #2 which originated as a phantom episode, thereby converting it to a real episode.

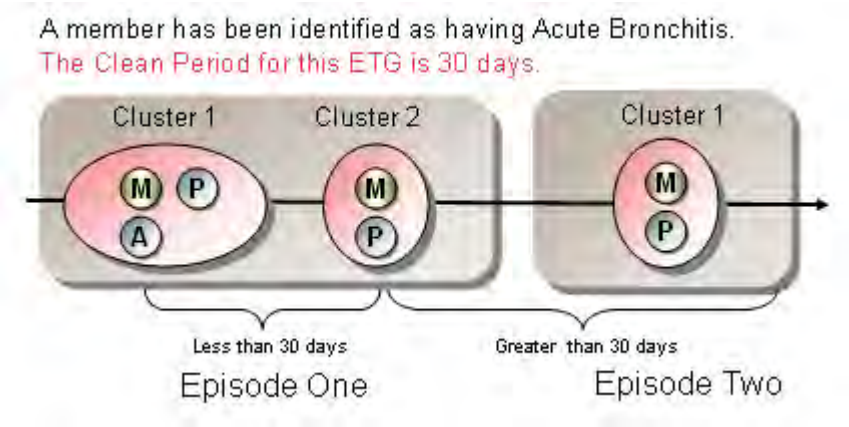


Time Windows: Clean Periods and Member Eligibility

Along with the clinical aspects of starting and grouping records to an episode, the method of episode completion is a crucial feature of ETG. The approach taken for the identification of a complete episode relies on a flexible, rather than a fixed length of time. There are no standard definitions of an episode's chronological length. The episode grouper continues to identify and track all clinical activity for an episode for as long as a condition is actively treated – a concept described as discrete dynamic clean periods. A clean period is defined as the absence of treatment for a specified period of time. Each ETG has its own unique clean period. For an acute condition the concept of a clean period is of most importance. For example, the clean period for Acute Bronchitis is 30 days. Once an episode has started for this ETG, anchor records clinically consistent for acute bronchitis group to this episode until such time as 30 days passes without any corresponding clinically consistent treatment. For Chronic Bronchitis, the clean period is 180 days, consistent with a more chronic illness. In some obvious instances, e.g. benign hypertension or diabetes, there is no clean period. The condition is basically life-long (chronic) and all clinically consistent treatments group to an episode of benign hypertension for as long as data are available.

The clean period window is dynamic in that each new anchor record that joins an episode moves the clean period window by extending the episode's dates. In this way, as long as a condition is consistently treated such that the date of each successive anchor record is less than or equal to the clean period date for the ETG, the episode can last forever.

The following diagram provides an illustration of this concept for an acute condition.



In this example, two episodes of **Acute Bronchitis** are created.

- Three office visits occurred for the treatment of acute bronchitis (record type M)
- The time frame between the second office visit and the third office visit was greater than 30 days, the clean period of this ETG. Therefore, a second episode was created for this condition

If the example above had been for a chronic condition, such as benign hypertension, all services would be grouped into a single episode since chronic conditions do not necessarily have an end to their clean period. To allow for analysis on chronic conditions, we offer 5 options for users to parse the episode into annual increments:

1. User chooses any month to begin year long episodes
2. Year long episodes will start from the beginning of the grouped data
3. Year long episodes will start from the member's eligible start date
4. Year long episodes will end at the end of the grouped data
5. Year long episodes will end at the member's eligible end date

Step 3: Group Non-Anchor Records

Non-anchor records represent services that are incidental to the direct evaluation, management and treatment of a patient. There are two types of non-anchor records: pharmacy records and ancillary records (such as laboratory tests, x-rays, and the facility component of ambulatory surgery centers services). Each non-anchor record links to only one cluster and eventually becomes part of the episode that the cluster is finally grouped to.

Ancillary records can do the following:

- Join an episode
- Convert a phantom episode into a real episode

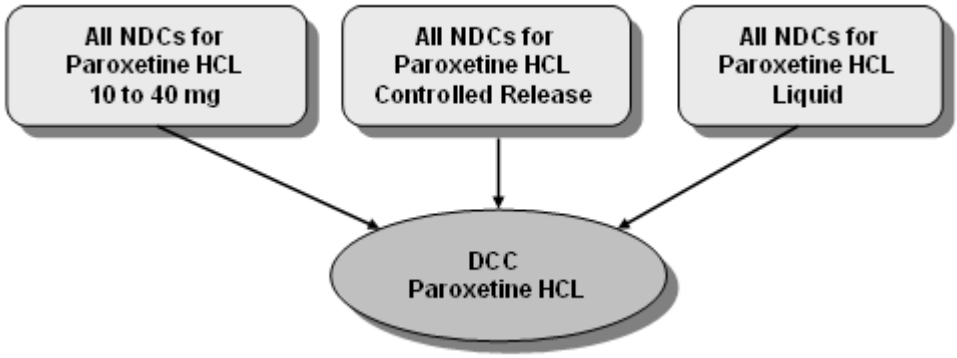
When the grouper assigns an ancillary record to an episode, it uses the ancillary record's diagnosis and procedure/revenue codes. It first evaluates diagnosis codes classified as *specific and nonspecific* to determine if these records can join an episode and then evaluates diagnosis codes classified as *sign and symptoms*. The ancillary record must occur within the clean period time window around an existing episode in order to be eligible to group to an existing episode. An ancillary record cannot extend an episode's length. It can only join an episode.

It is possible for an ancillary claim record to be medically inappropriate for any episode or condition for a member. If an ancillary record is not eligible to join an open episode it is then evaluated to determine if it can be assigned to a preventive ETG (screening and immunizations). If an ancillary record cannot be assigned to a valid ETG or a preventive ETG, it is identified as an orphan record. An example of this would be when a provider calls in a prescription for the patient rather than seeing the patient in his/her

office. The pharmacy claim would not have an anchor record to group to, so it would be considered an orphan.

For drug records, the methodology evaluates each pharmacy record against the episodes for which the patient is being treated. The NDC code assigned to the pharmacy record provides the clinical information to support this evaluation. Just as with the procedure and diagnosis codes, a drug eligibility table identifies ETGs to which an NDC can be associated and the strength of that association (low, medium, high), allowing the grouper to assign the drug claim record to the most clinically appropriate episode. HCPCS Level II procedure codes which represent a drug and its administration (e.g., injectables) are also considered to be pharmacy records, and are grouped in the same way. Due to the large number of NDCs defined for pharmacy services, the ETG methodology uses a drug classification hierarchy to support grouping. Each drug is associated with a Drug Classification Code (DCC) which represents a drug, or a specific dosage form of a drug. For example, the NDCs for all strengths of the antidepressant Paroxetine maps to the DCC of Paroxetine. The DCC concept assigned to the pharmacy services then supports grouping, not the NDC.

The following diagram illustrates this drug hierarchy.



Like ancillary records, drug records cannot extend an episode's length; they can only join an episode. A drug record must occur within an episode's clean period (pre and post) in order to be eligible to group to it.

Step 4: Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

After all claim records have grouped to an episode, the grouper then has all of the information it needs to finalize the episode.

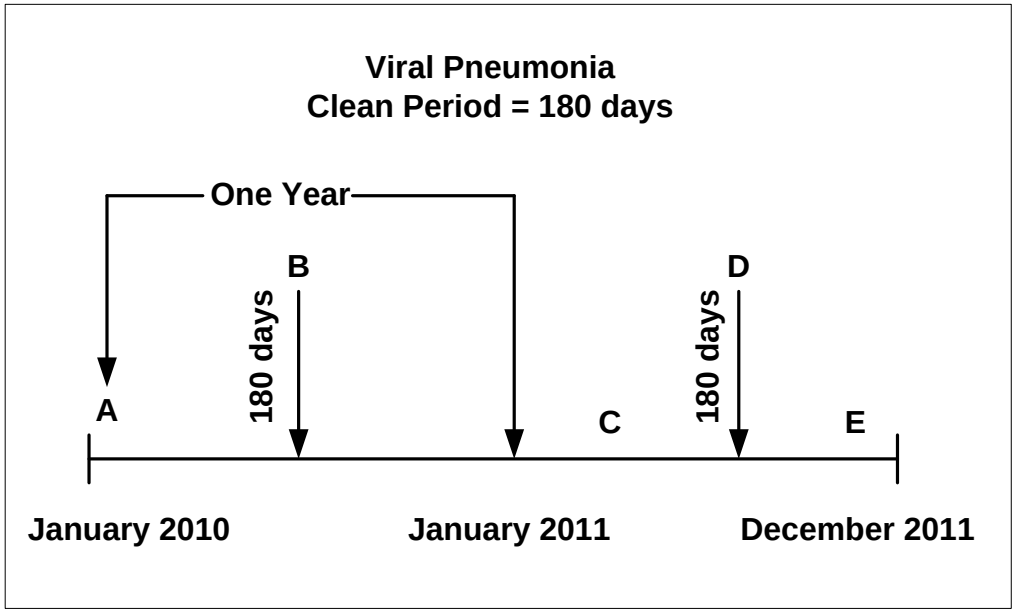
Episode Completeness

The notion of a complete episode is complex in the reality of service data. For example, assume the grouping start date is January 1, 2010. Does an episode for an acute condition with its first anchor record on January 3, 2010 begin with this claim or is the episode in progress? The episode of the acute condition might have begun sometime earlier (prior to January 1, 2010) but the data to identify the exact begin date are not available. The opposite is also true. With data available from January 1, 2009 through December 31, 2010, can it be known if a record incurred on December 21st for an existing episode is the end of the episode? The answer to both questions is that under certain circumstances it cannot be known whether a claim service record is actually the true beginning or the true end of an episode. A distinction must be made between episodes which are to be considered complete from those whose completeness cannot be determined.

A clean start is defined as a situation where the true beginning date for an episode is known. The ETG methodology identifies a clean start by comparing the incurred date of the first anchor record of an episode with the beginning date of the overall service data range used in the grouping (or a member's

beginning eligibility date, if later), with the episode's ETG clean period. If that anchor record date starts after the number of pre-episode clean period days, the episode is considered to have a clean start. If it occurs within the clean period days, it is considered to have an unknown start. The same methodology is true for a clean finish. A clean finish uses the same number of clean period days to determine a known finish. If the last anchor record occurs prior to the clean period days, the episode is determined to have a clean finish. If the last anchor record occurs within the clean period days, it has an unknown finish.

The following diagram illustrates this concept. In this example, anchor records for this episode occur at dates A, B, C, D and E. Note that treatment for this episode spans well over one year.



Assume that the time frame from each anchor record to the next is less than 180 days.

• The anchor record at date A is an unknown start.

• The anchor records at dates B and C (if either were the first anchor records in this episode) represent a clean start.

• The anchor records at dates D and E (if either were the last anchor records in this episode) represent an unknown finish.

The Episode Type identifies the completeness of an episode. Each acute episode is assessed for its status as a full year episode, and if it has a clean start and/or a clean finish. The episode's start and end dates are compared against the clean period days. From this information, the Episode Type can be determined.

The following table identifies the episode type values and whether they are considered complete or incomplete.

Episode Type	Description	Completeness Status
0	Clean start, clean finish	Complete
1	Clean start, unknown finish (full year)	Complete
2	Unknown start, clean finish (full year)	Complete
3	Unknown start, unknown finish (full year)	Complete
4	Clean start, unknown finish	Incomplete
5	Unknown start, clean finish	Incomplete
6	Unknown start, unknown finish	Incomplete
7	Incomplete annual episode	Incomplete

To account for chronic conditions, the ETG methodology utilizes different logic than the clean/unknown starts and finishes approach described above. ETG does this since chronic conditions are life-long going forward. Further, to support proper episode-to-episode comparisons, the grouper limits the length of each episode for a chronic condition to one year. Such episodes which extend beyond one year and are subsequently limited to one year for analytical purposes are referred to as chronic annual episodes. As mentioned above, the grouper provides different configurable options on how to decide the starting point for chronic episodes: start month (a static month), grouping start date, grouping end date, eligibility start date and eligibility end date.

The grouper uses that selection and looks forward or back 365 days, collects all anchor records within that timeframe and assigns them to an episode. It does this in segments of 365 days. It then collects the non-anchor records and assigns them to the appropriate annual episode. To determine, within an annual year, if a chronic annual episode is considered complete, the grouper determines the member's enrollment during that time span: if the member is eligible for the entire year, that episode is considered complete (episode type 0); if not, the episode is considered incomplete (episode type 7).

The start date and end date for chronic annual episodes is based on the configurable selection made and is a full year date span. It does not reflect the date of the first and last anchor records within the episode, as acute episodes do.

Assign Complications/Condition Status, Comorbidities and Treatments to Episodes

The ETG methodology also identifies complication, comorbidity and treatment factors observed for each episode. After core grouping, episodes are evaluated to determine if they have any complicating factors, if there are any comorbidities associated with the episode's condition, and if the activity within the episode contains any treatment indicators. This information is reflected in the ETG number, allowing one to see specific characteristics of each episode. The first 6 digits are the base class, a unique number identifying the ETG; the 7th, 8th and 9th digits are the flags (with "0" indicating the factor was not observed, and "1" indicating it was) for with or without complication, with or without comorbidity and with or without treatments. The following table provides an illustration of the ETG numbers for Diabetes.

Base ETG	ETG Number	ETG Long Description
163000	163000000	Diabetes, w/o complication, w/o comorbidity, w/o surgery
163000	163000001	Diabetes, w/o complication, w/o comorbidity, with surgery
163000	163000010	Diabetes, w/o complication, with comorbidity, w/o surgery
163000	163000011	Diabetes, w/o complication, with comorbidity, with surgery
163000	163000100	Diabetes, with complication, w/o comorbidity, w/o surgery
163000	163000101	Diabetes, with complication, w/o comorbidity, with surgery
163000	163000110	Diabetes, with complication, with comorbidity, w/o surgery
163000	163000111	Diabetes, with complication, with comorbidity, with surgery

Identifying the condition status/complications for an episode provides specificity of the episode's clinical condition, any complications associated with the episode, and the disease progression, when applicable. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as condition status codes. For example, condition statuses for Diabetes include Diabetes Type 1 and Diabetes Type 2. Examples of condition statuses that specify complications of Diabetes are Diabetic Coma and Diabetic Ketoacidosis.

Condition status codes are identified by diagnosis codes on anchor records, are ETG-specific and must occur within an episode in order for the episode to be designated as *with complication*. For example, the diagnosis of diabetic coma would not be a condition status code for an episode of chronic bronchitis. It would, however, be a condition status code for an episode of diabetes. In addition to flagging the ETG as *with complication*, the grouper provides an optional output that lists each condition status that was identified within an episode.

A comorbidity is defined as the presence of more than one disease or health condition in a member at a given time. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as comorbidity codes. For example, the comorbidity *Chronic bronchitis* is a compilation of the various diagnosis codes designated as such (e.g. Bronchiectasis, Chronic bronchitis NOS, etc.). The grouper identifies comorbidities by evaluating diagnosis codes on the records designated as anchor records. It keeps track of all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as *with comorbidity*.

Comorbidities are ETG-specific. For example, the comorbidity of Chronic Bronchitis would not be a comorbidity for an episode of Lymphoma. It would, however, be a comorbidity for an episode of Congestive Heart Failure. Any comorbidity that has an active period that occurs during an eligible

episode's time frame is considered a comorbidity for that episode.

Treatment indicators are categorizations of services such as defining surgeries and active management procedures for malignant neoplasms (chemotherapy and radiation therapy services). These categories are a grouping of similar procedures. For example, the treatment indicator for Chemotherapy is a compilation of the procedure codes and revenue codes that are classified as chemotherapy services.

When flagging the ETG as *with or without surgery*, the ETG methodology provides more specificity for certain conditions. For malignant neoplasms, the grouper will also designate if an episode incurred active management services. For cardiology conditions, the grouper will also designate if an episode incurred these specific defining surgeries: angioplasty, CABG and valve surgery. The exact nature of the treatment will be specified by the value of the treatment indicator digit. The procedure and/or revenue codes categorized as a treatment indicator must occur within an episode in order for the episode to be flagged as such.

Given the ETG numbering scheme, where the first six digits define the base condition and the remaining digits describe treatment and other clinical factors, users of the ETG outputs have flexibility in how the grouped results are applied. For example, if the desire is to measure at the condition level, episodes are combined for analysis using the first six digits of the ETG number (the first six digits identify the base ETG). If the combination of condition and the presence (or not) of a significant surgery are desired to support comparisons, users would combine episodes using the first six digits and the ninth digit of the ETG number. As described below, severity levels can also be used in addition to support comparisons.

Severity Adjusting Episodes

Complications, comorbidities and member demographics are used in determining the severity of the member's episode. The ETG methodology takes advantage of the relevant complication and comorbidity factors (indicating a sicker member who may require more extensive treatment for a related condition) when determining an episode's severity. The result is a severity score and severity level for episodes. The higher the severity score, the more resources are expected relative to episodes with a lower severity score for the same base ETG.

After condition statuses and comorbidities have been assigned to an episode, the grouper can determine the severity score and severity level for each episode. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for each base ETG where severity is measured. There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights for many conditions.

Based on the severity score, the severity level indicates a ranking of where the specific episode is relative to the population of all episodes within that base ETG. There are four potential severity levels, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. Not all ETGs are severity adjusted and not all ETGs have 4 severity levels. All episodes for ETGs that are not severity adjusted have a severity score of 1.00 and a severity level of 1.

Outlier Status

Outlier status is the comparison of an episode's costs to a dollar amount specified for each ETG. An episode is considered a low outlier if its costs are below the ETG-specific low outlier amount; an episode is considered a high outlier if its costs are above the ETG-specific high outlier amount. The ETG Base Class in combination with the episode's severity level is used to determine the outlier status. All costs within the episode are evaluated (i.e., all record types).

II. ETG Construction Logic for CHF Episodes of Care

Episodes for the submitted CHF measures are defined using the Episode Treatment Group (ETG) methodology. Section I of this document describes the general approach used by ETG to create episodes of care. This section applies that general methodology to create CHF episodes. Also, please note that this description will reference a number of attachments included with the submission for these measures, including:

- S5_CHF_DataDictionary (Excel workbook attachment). This attachment describes the clinical relationships between diagnosis and procedure codes and the episode condition.
- S8_CHF_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CHF methodologies that relate to comorbidities, condition status factors, and severity adjustment.

The individual Worksheets in these attachments that relate to the specific components of the methodology are referenced in the following discussion.

As noted above, the ETG episode building process has four important steps:

1. Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
2. Build Episodes from Anchor Records
3. Group Non-Anchor Records to Episodes
4. Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

In this section we discuss how these steps apply specifically to creating CHF episodes.

Step 1 (CHF). Assign a Record Type and Anchor Records, Classify Diagnoses and Procedures

Record Type Assignment

Each service record, or claim line, is assigned a record type. Assigning Record Type uses a combination of the procedure code and the provider type on the claim. As described in Section I, there are 5 record types used by ETG:

- Management Records (for example, an office visit or consultation)
- Surgery Records (for example, a surgical procedure)
- Ancillary Records (for example, a lab test or imaging service)
- Facility Records (room and board)
- Pharmacy

Anchor Record Assignment

Anchor Records are also identified as part of this step. Anchor records play an important role in building CHF episodes. Anchor records have a record type of Management, Surgery, or Facility. An anchor record indicates that a clinician has evaluated the patient and has initiated the treatment and care of the patient for the condition.

Classify Diagnosis Codes

As described in Section I of this document, ETG relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an

ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes applied across all episodes, including ETG:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG. ICD-9 Diagnosis code 428.0 (congestive heart failure, unspecified) is an example of a specific diagnosis code. It is primary to, and only eligible for, an episode of CHF.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG. ICD-9 Diagnosis code 425 Cardiomyopathy is an example of a non-specific ICD-9 code. Although this code represents disease as opposed to signs or symptoms of disease, it is not specific as to representing a single disease. This code is assigned a lower specificity—Non-specific.
- Signs and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition. ICD-9 Diagnosis code 786.5 Chest pain does not represent diseases, but only signs and symptoms that could be related to multiple diseases. These codes are assigned the lowest specificity— Signs and Symptoms. Signs and Symptoms codes may be eligible for many ETGs due to their generic nature.

The ETG methodology considers one member at a time. The service records and their diagnosis codes are grouped in several distinct passes for a member. The methodology first processes the specific and non-specific diagnosis codes on anchor records so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to. Using this approach, the logic described below that links service records to CHF episodes is applied.

Each diagnosis code is matched with one or more ETGs through a diagnosis eligibility table, including codes that match to the ETG for CHF. Each diagnosis code is further ranked, based on its strength of association with the CHF ETG and other ETGs. The rank values are:

- Primary Classification Ranking diagnoses: A primary ranking classification for a diagnosis describes a condition that defines CHF. These are the main diagnosis codes that impact grouping decisions for CHF. The Diagnosis codes that are classified as primary to CHF are listed on the “PrimaryDxCodes” worksheet within the attachment “S5_CHF_DataDictionary”.
- Incidental Classification Ranking diagnoses: Incidental diagnosis codes are eligible for CHF, but not classified as primary. Incidental diagnoses are further ranked as low, medium, and high, representing the strength of the match association with CHF. The Diagnosis codes that are incidental to CHF are listed on the “IncidentalDxCodes” worksheet within the attachment “S5_CHF_DataDictionary”. The column “diagnosisEligibilityType” in the worksheet describes the ranking where 3 represents a high association, 2 represents a medium association and 1 represents a low association.

Classify Procedure Codes

Procedure codes are also matched to CHF. All procedure codes that are eligible for CHF are listed on the “ProcedureCodes” worksheet within attachment “S5_CHF_DataDictionary”. In some instances a procedure code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the procedure code has eligibility, the ETG methodology uses strength of the clinical relationship between the procedure code and the episode. The CPT and HCPCS procedure codes on this worksheet are ranked from 1 to 4 to specify the strength of the clinical relationship between the procedure code and CHF. The column “ProcedureRank” in the worksheet describes that strength of association, with 4 being the strongest association and 1 being the lowest. The grouping of services based on diagnosis and procedure codes is further described below.

Step 2 (CHF). Build Episodes from Anchor Records.

Given the clinical relationships described in Step 1, the following steps are further used to build episodes from anchor records:

a. Anchor records are grouped in two passes through the member's data. The first pass groups the anchor records with specific and non-specific diagnoses. The second pass groups anchor records with sign and symptoms diagnoses.

b. All anchor records are grouped before all non-anchor records. Non-anchor records have a record type of Ancillary or Pharmacy.

c. An episode of CHF requires an anchor record to start an episode. For an anchor record to start an episode of CHF, it must have a procedure code that is eligible for CHF and an ICD-9 diagnosis code that is primary for CHF. As an example of an anchor record that starts an episode of CHF, a cardiologist sees a member and submits a claim record using the CPT procedure code 99212 (Office visit, established patient) with and ICD-9 diagnosis code 428.0 (congestive heart failure, unspecified).

   Note that a single anchor record can start more than one episode. For example, an anchor record with a diagnosis and procedure code combination that is eligible for CHF will start a CHF episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it will also start a Hypertension episode. (See Section I above for a discussion of the concept of phantom episode clusters.)

d. Once an episode of CHF is started, further anchor records can group to that episode. For a record to be eligible to join an already open episode of CHF the procedure code for the record must be eligible for CHF and the diagnosis code must have either a primary or incidental relationship to CHF.

e. In some cases, an anchor record can be eligible to join more than one episode (because it may have more than one diagnosis code). When determining the episode an anchor record groups to, the specificity of the diagnoses determines the priority for grouping the record. For CHF, a specific code (like 428.0 (congestive heart failure, unspecified)) has priority over a non-specific code (like 425 Cardiomyopathy)

f. As described above, diagnosis codes with specificity of sign and symptom have the lowest priority for grouping. An example of a sign and symptom code is 786.5 (Chest pain). Anchor records with only sign and symptom diagnosis codes are not grouped until anchor records with more specific disease diagnosis codes are grouped. For example, an office visit record on Jan 15th with an ICD-9 code of 786.5 (Chest Pain) is followed by an office visit record on Feb 1st with an ICD-9 code of 428.0 (congestive heart failure, unspecified). The grouper would skip the anchor record service on Jan 15th because it only had a sign and symptom diagnosis code. It would then open up an episode of CHF based on the claim on Feb 1st. On the second pass, the grouper would use the incidental relationship between the sign and symptom ICD-9 code 786.5 to group this claim to the already open CHF episode. Without this methodology, the claim on Jan 15th would not group to the CHF episode on the first pass because at the time of the first pass evaluating the claim on Jan 15th, the CHF episode did not exist.

g. Following these steps, anchor records have been used to open episodes of CHF, as well as episodes for other conditions and anchor records have been assigned uniquely to individual episodes based on the clinical logic described above and in the attachment "S5_CHF_DataDictionary".

Step 3 (CHF). Group Non-Anchor Records to Episodes.

Non-anchor records (record type "Ancillary" and "Pharmacy") can not open episodes on their own. For example, a service record with a procedure code of 93000 (Electrocardiogram, routine ECG with at least 12 leads; with interpretation and report) and an ICD-9 code of 428.0 (congestive heart failure, unspecified) can group to an open episode of CHF but can not open the episode itself.

Ancillary service records group to CHF based on a match of diagnosis and procedure code to CHF. As described above, attachment S5_CHF_DataDictionary includes the diagnosis and procedure mappings for CHF that inform these assignments.

In some instances an Ancillary procedure code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the procedure code has eligibility, the ETG methodology uses strength of the clinical relationship between the procedure code and the episode. The column "ProcedureRank" in the "ProcedureCodes" worksheet within attachment "S5_CHF_DataDictionary" describes that strength of association, with 4 being the strongest association and 1 being the lowest.

Pharmacy services group differently because they usually do not have ICD-9 diagnosis codes associated with them. Pharmacy claims group by using a table that maps NDC to the ETG DCC code (Drug Category Code) based on the drug's active ingredients and route of administration. Selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC (e.g., J-codes describing injections). For example, a service with an NDC code 00378044701 (Benazepril HCL 40mg) will map to DCC 25600. The DCC 25600 has a relationship with CHF as defined by the "Pharmacy" worksheet in the attachment "S5_CHF_DataDictionary". Therefore this claim could join an open episode of CHF. It could not, however, start an episode of CHF on its own.

In some instances a DCC code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the DCC code has eligibility, the ETG methodology uses strength of the clinical relationship between the DCC code and the episode. The column "Rank" in the "Pharmacy" worksheet within attachment "S5_CHF_DataDictionary" describes that strength of association. The lower the value is for Rank, the stronger the association between the DCC and the episode.

Due to the size of the attachment the full list of NDC to DCC mappings has not been provided within this submission. This file is available upon request.

Step 4 (CHF): Finalize the Episodes (Identify Comorbidities and Complicating Factors, and Assign Episode Severity)

Episode Completeness

Episode completeness, the assignment of comorbidities and condition status, and the measurement of episode severity are the key steps in finalizing a CHF episode.

In terms of episode completeness, CHF is a life-long, chronic condition. Therefore the clean periods described in Section I as part of the general ETG methodology are not applicable. All clinically consistent treatments for the care of a CHF patient will group to the episode of CHF for as long as data are available. To support proper episode comparisons, it is recommended that these longer CHF episodes be divided into annual increments.

Assigning Comorbidities and Condition Status Factors to CHF Episodes

The ETG methodology identifies the comorbidities and condition status factors observed for each CHF episode. These factors provide specificity of the episode's clinical condition and also play a key role in assigning a severity score and level to the episode. An example of the assignment of comorbidities and condition status factors and creation of a severity score and level is provided at the end of step 4 and references to this example are provided in the following text.

Condition status factors for CHF episodes are identified by diagnosis codes on anchor records that occur within the CHF episode. The "ConditionStatustoDxCodeMap" Worksheet in the attachment "S8_CHF_ClinicalLogic" describes the mapping of diagnosis codes to condition status factors. In particular, the following condition status factors are defined for CHF:

- Congestive heart failure, with diastolic heart failure
- Rheumatic heart failure

Comorbidity factors for CHF episodes are identified by evaluating diagnosis codes on the records

designated as anchor records from outside the CHF episode. ETG tracks all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as with comorbidity. The comorbidity groups defined by ETG for CHF are described in the "ComorbtoDxCodeMap" Worksheet in the attachment "S8_CHF_ClinicalLogic", including the individual diagnosis codes that map to each. Examples of these comorbidity groups include Pulmonary Tuberculosis, Ischemic Heart Disease and Pulmonary Embolism. In the example included below, the comorbidities 80018 (diabetes) and 80173 (cardiomyopathy) are assigned to the CHF episode based upon the diagnosis information on anchor records that occur outside of the CHF episode.

Assigning Severity to CHF Episodes

Condition status factors, comorbidities and patient demographics are used in determining the severity of the CHF episode. The ETG methodology takes advantage of the relevant condition status and comorbidity factors when determining an episode's severity. In general, these factors indicate a higher risk patient who may require more extensive treatment for CHF. The result is a severity score and severity level for each episode. The higher the severity score, the more resources are expected relative to other CHF episodes.

The condition status and comorbidity factors found to have an impact on the required resources for CHF episodes are included in the severity model. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for the base ETG of CHF. There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights.

The following worksheets in the attachment "S8_CHF_ClinicalLogic" describe the factors and weightings used in determining the level of severity for a CHF episode (see the notes at the top of each worksheet for a further description of the comorbidity or condition status concept):

- Worksheet "Comorbidities" – includes the ComorbidityCodes and Comorbidity Groups used to determine severity for CHF. The rightmost columns include a "Priority" hierarchy along with risk weights for the non-elderly and elderly models. The Priority column is applied where multiple ComorbidityCodes in the same Comorbidity group are identified, with the lowest number priority receiving precedence. Each risk weight reflects the incremental contribution of having a specific Comorbidity factor on CHF severity. (Note that a number of the individual ComorbidityCodes that are clinically similar are combined and used as a group in measuring severity. Only one of these individual Codes is needed to trigger the aggregate Comorbidity Group2, after application of any relevant Priority.);
- Worksheet "ComorbidityInteractions" – includes the interactions between Comorbidity Groups used to determine severity for CHF. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Comorbidity interaction factor on CHF severity;
- Worksheet "ComorbidityCounts" – includes the additional severity factors added for those episodes where 3 or more comorbidity factors were observed. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Comorbidity Count factor on CHF severity;
- Worksheet "ConditionStatuses" – includes the Condition Status factors used to determine severity for CHF. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status factor on CHF severity;
- Worksheet "ConditionStatusInteractions" – includes the interactions between Condition Status factors used to determine severity for CHF. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status interaction factor on CHF severity;

- Worksheet “ConditionStatusCounts” – includes the additional severity factors added for those episodes where 3 or more condition status factors were observed. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific ConditionStatus Count factor on CHF severity;
- Worksheet “Demographics” – includes the additional severity factors added based on age and gender. Each risk weight reflects the incremental contribution of having a specific Demographic factor on CHF severity;

The severity score for a CHF episode is the sum of the weights for each of the factors observed for the episode.

The following example shows the calculation of severity score and level for a CHF episode.
The example describes a Male patient, age 60, observed to have a number of anchor records with diagnoses that map to the CHF ETG. The patient is also observed to have two comorbidities that are also eligible for CHF. The comorbidities 80018 (diabetes) and 80173 (cardiomyopathy) both were identified on one or more anchor records observed outside of the CHF episode.

The patient receives a severity marker for each of the comorbidity factors and a risk weight is assigned to each. The patient also receives severity weight related to his age and gender which fall into the “Male 55-64” range

A severity score of 1.1642 is calculated based upon the sum of:

- The Demographic weight of 0.2733 (see worksheet “Demographics” within S8_CHF_ClinicalLogic where column “gender”=M and column “ageRange”=55-64);
- The comorbidity weight for Diabetes of 0.1513 (see worksheet “Comorbidities” within S8_CHF_ClinicalLogic where column “comorbiditycode”=80018. The Diabetes comorbidity belongs to the Comorbiditygroup2 of Diabetes.);
- The comorbidity weight for Cardiomyopathy of 0.7396 (see worksheet “Comorbidities” within S8_CHF_ClinicalLogic where column “comorbiditycode”=80173. The Cardiomyopathy comorbidity belongs to the Comorbiditygroup2 of Heart Disease 2.);
- The final severity score, including the comorbidity interaction adjustment is calculated as 0.2733 + 0.1513 + 0.7396 = 1.1642

Based on the severity score, the severity “level” indicates a categorical ranking of where the specific episode is relative to the population of all CHF episodes. There are four potential severity levels for CHF, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. The “Thresholds” Worksheet in attachment “S8_CHF_ClinicalLogic” describe the three cut-off points that define the four levels of severity for CHF episodes.

The following example shows the calculation of severity score and level for a CHF episode.

Episode	ETG(Base Condition)	Complications			
1	Congestive HeartFailure				
		Comorbidities			
		80018	80173		
		Severity Level			
		1	2	3	4
		< 0.5	0.5 - 1.0	1.0 - 2.0	> 2.0
		Calculation of Relative Episode Severity			
		Indicator	Code	Description	Severity Weight
		Demographic	20	M55-64	0.2733
		Condition Status			
		Co-morbidity	80018	Diabetes	0.1513
			80173	Cardiomyopathy	0.7396
		Interaction			
		Total			1.1642

Example of Calculating ETG Episode Severity Score and Level.

The ETG methodology for CHF uses medical and pharmacy service records and member enrollment as input. Outputs for CHF include the identification of the individual service records assigned to a CHF episode, along with the details of the grouping, including ETG, episode ID, record type, cluster ID, and cluster provider. An episode summary record is also produced, describing the episode ID, the ETG assigned (CHF), the severity score and severity level for the episode, episode completion status, and other episode-level characteristics.

Note that the episode grouping methodology for CHF is applied in the context of the full-breadth of the ETG clinical methodology, where all clinical conditions and episodes can be considered and created for a member. In this way, decisions regarding the appropriate assignment of a service record to an individual CHF episode can be made while considering all conditions and episodes for that member, including episodes other than CHF.

The episode results can then be used to support episode-based measures of the resources involved in diagnosing, managing and treating CHF as further discussed within the Diabetes specifications provided in the submission form.
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Medical Claim Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

RX Claim Data Elements

NQF Resource Use Measure submission
For question S6 - Answer: Ingenix Data Protocol
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, C

Data Element Name	Field Type	Maximum Length
Member ID	alphanum	32
Date of Service	date	10
Payment Date	date	10
NDC Code	alphanum	11
Prescribing Provider ID	alphanum	20
Allowed Amount	numeric	10.2
Requested/Billed Amount	numeric	10.2
Payment Amount	numeric	10.2

CAD, Non-Condition Specific/Population

Data Element Comments

Unique Member Identifier
May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Includes capitation and patient liability amounts
Includes withhold amounts

Member Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, No

Data Element Name	Field Type	Maximum Length
Member ID	alphanum	32
Sex	alphanum	1
Date of Birth	date	10
Effective Date	date	10
End Date	date	10
Member Zip Code	alphanum	10
Member State Code	alphanum	2
Pharmacy Benefit Flag	alphanum	1
PCP ID	alphanum	20
Product/Coverage Code Identifier	alphanum	30

n-Condition Specific/Population

Data Element Comments
Unique Member Identifier
Eligibility Begin Date
Eligibility End Date
Supports geographic-based member analysis. May be omitted if not available or applicable.
Supports geographic-based member analysis. May be omitted if not available or applicable.
Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

Provider Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

The content contained in this document is proprietary and confidenti

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Str

Data Element Name	Field Type	Maximum Length
Provider ID	alphanum	20
Provider Specialty	alphanum	30
PCP Indicator	numeric	1
Provider Zip Code	alphanum	10
Provider State Code	alphanum	2
Provider Affiliation	alphanum	30

al
oke, CAD, Non-Condition Specific/Population

Data Element Comments

Unique Provider Identifier
Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
Indicates whether or not the Provider can serve as a PCP
Supports geographic-based provider analysis. May be omitted if not available or applicable.
Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

Medical Claim Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

RX Claim Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
Payment Date	date	10	
NDC Code	alphanum	11	
Prescribing Provider ID	alphanum	20	May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

Member Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Sex	alphanum	1	
Date of Birth	date	10	
Effective Date	date	10	Eligibility Begin Date
End Date	date	10	Eligibility End Date
Member Zip Code	alphanum	10	Supports geographic-based member analysis. May be omitted if not available or applicable.
Member State Code	alphanum	2	Supports geographic-based member analysis. May be omitted if not available or applicable.
Pharmacy Benefit Flag	alphanum	1	
PCP ID	alphanum	20	Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Product/Coverage Code Identifier	alphanum	30	Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

Provider Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
PCP Indicator	numeric	1	Indicates whether or not the Provider can serve as a PCP
Provider Zip Code	alphanum	10	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider State Code	alphanum	2	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider Affiliation	alphanum	30	Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

NQF Resource Use Measure submission
For question S10 - Answer: Ingenix Risk Adjustment Method Example
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Cardiology, Medical Group A				
Condition and Severity Level	**Number of Episodes**	**Observed Cost per Episode**	**Peers Cost per Episode**	**Relative Cost of Care Ratio**
Dr Jones	**By Condition and Severity Level**			
CHF, Level 1	20	$1,116	$1,320	0.85
CHF, Level 2	16	$1,775	$2,234	0.79
CHF, Level 3	12	$2,977	$3,145	0.95
Dr Smith	**By Condition and Severity Level**			
CHF, Level 1	30	$1,520	$1,320	1.15
CHF, Level 3	12	$3,349	$3,145	1.06
Dr Jones	**By Condition**			
CHF	48	1,801	2,081	0.87
Dr Smith	**By Condition**			
CHF	42	2,043	1,841	1.11

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: CHF

	ETG Base 386800 - CHF									
	Data Source									
Cardiology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	224	372	733	843	3,073	41	614	360	125	6,384
Cost per Episode	$ 3,725	$ 4,258	$ 3,876	$ 1,734	$ 3,724	$ 3,363	$ 2,702	$ 3,516	$ 3,388	$ 3,391
Primary Care Core Cost per Episode	$ 64	$ 89	$ 67	$ 60	$ 60	$ 74	$ 89	$ 84	$ 85	$ 67
Specialist Cost per Episode	$ 891	$ 1,042	$ 2,487	$ 592	$ 806	$ 1,087	$ 564	$ 701	$ 691	$ 957
ER Cost per Episode	$ 91	$ 38	$ 74	$ 37	$ 44	$ 16	$ 51	$ 55	$ 39	$ 49
Radiology Cost per Episode	$ 48	$ 124	$ 90	$ 59	$ 58	$ 139	$ 49	$ 80	$ 102	$ 67
RX Cost per Episode	$ 359	$ 235	$ 190	$ 103	$ 218	$ 181	$ 158	$ 173	$ 230	$ 197
Lab Cost per Episode	$ 201	$ 89	$ 341	$ 72	$ 26	$ 115	$ 51	$ 89	$ 110	$ 86
Hospital Cost per Episode	$ 2,071	$ 2,640	$ 627	$ 811	$ 2,513	$ 1,752	$ 1,741	$ 2,333	$ 2,131	$ 1,967

	ETG Base 386800 - CHF									
	Data Source									
Cardiology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	224	372	733	843	3,073	41	614	360	125	6,384
Specialist Visits per 1000 Episodes	4,429	4,038	2,940	2,773	4,600	3,488	4,894	2,952	2,358	4,014
Radiology Encounters per 1000 Episodes	819	617	492	651	802	476	842	615	567	723
Lab Encounters per 1000 Episodes	1,928	2,057	3,327	2,506	519	2,726	3,174	3,056	2,257	1,689
MRI Encounters per 1000 Episodes	-	8	0	-	3	12	3	7	-	3
ER Visits per 1000 Episodes	116	31	107	52	63	12	74	63	32	67
Inpatient Days per 1000 Episodes	840	1,080	135	482	1,275	293	1,267	689	329	954
Admissions per 1000 Episodes	232	121	33	75	174	122	213	222	56	147

	ETG Base 386800 - CHF									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	533	166	996	2,208	1,893	208	1,191	1,943	112	9,249
Cost per Episode	$ 2,862	$ 3,945	$ 5,564	$ 3,047	$ 3,659	$ 4,111	$ 3,017	$ 3,255	$ 2,658	$ 3,508
Primary Care Core Cost per Episode	$ 170	$ 141	$ 122	$ 119	$ 98	$ 206	$ 112	$ 200	$ 267	$ 138
Specialist Cost per Episode	$ 841	$ 1,087	$ 3,562	$ 721	$ 831	$ 789	$ 558	$ 632	$ 481	$ 1,022
ER Cost per Episode	$ 84	$ 84	$ 136	$ 112	$ 62	$ 87	$ 59	$ 70	$ 69	$ 86

Radiology Cost per Episode	$ 45	$ 71	$ 131	$ 50	$ 43	$ 65	$ 41	$ 65	$ 69	$ 60
RX Cost per Episode	$ 197	$ 194	$ 146	$ 120	$ 194	$ 150	$ 150	$ 153	$ 255	$ 157
Lab Cost per Episode	$ 29	$ 103	$ 447	$ 54	$ 20	$ 93	$ 40	$ 117	$ 106	$ 102
Hospital Cost per Episode	$ 1,497	$ 2,265	$ 1,021	$ 1,871	$ 2,411	$ 2,721	$ 2,056	$ 2,019	$ 1,409	$ 1,944

	ETG Base 386800 - CHF									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	533	166	996	2,208	1,893	208	1,191	1,943	112	9,249
Specialist Visits per 1000 Episodes	3,877	3,382	4,047	4,703	4,718	2,932	5,658	2,834	2,841	4,232
Radiology Encounters per 1000 Episodes	920	919	723	965	873	491	1,074	763	954	878
Lab Encounters per 1000 Episodes	1,311	2,237	2,736	2,508	519	2,406	2,957	3,337	2,903	2,286
MRI Encounters per 1000 Episodes	0	-	1	-	2	5	4	1	-	1
ER Visits per 1000 Episodes	121	75	216	137	106	89	139	114	76	131
Inpatient Days per 1000 Episodes	788	791	511	2,053	1,645	457	1,751	915	1,058	1,382
Admissions per 1000 Episodes	199	127	91	237	195	154	249	246	143	209

	ETG Base 386800 - CHF									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	918	479	1,124	2,937	7,688	121	1,008	2,364	230	16,870
Cost per Episode	$ 3,031	$ 4,511	$ 6,127	$ 3,499	$ 4,155	$ 5,101	$ 2,978	$ 4,233	$ 3,656	$ 4,062
Primary Care Core Cost per Episode	$ 174	$ 132	$ 91	$ 122	$ 117	$ 139	$ 128	$ 180	$ 153	$ 130
Specialist Cost per Episode	$ 842	$ 971	$ 3,935	$ 796	$ 873	$ 1,320	$ 580	$ 678	$ 651	$ 1,020
ER Cost per Episode	$ 90	$ 85	$ 181	$ 117	$ 59	$ 120	$ 75	$ 95	$ 66	$ 86
Radiology Cost per Episode	$ 39	$ 90	$ 155	$ 47	$ 38	$ 68	$ 51	$ 62	$ 76	$ 54
RX Cost per Episode	$ 173	$ 213	$ 161	$ 136	$ 206	$ 159	$ 165	$ 129	$ 265	$ 176
Lab Cost per Episode	$ 36	$ 71	$ 558	$ 61	$ 27	$ 162	$ 49	$ 114	$ 110	$ 86
Hospital Cost per Episode	$ 1,677	$ 2,949	$ 1,046	$ 2,220	$ 2,834	$ 3,134	$ 1,929	$ 2,975	$ 2,334	$ 2,509

	ETG Base 386800 - CHF									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	918	479	1,124	2,937	7,688	121	1,008	2,364	230	16,870
Specialist Visits per 1000 Episodes	4,613	3,771	4,724	4,946	5,557	5,266	5,592	3,291	2,529	4,934
Radiology Encounters per 1000 Episodes	1,026	728	869	1,064	930	593	989	890	633	940
Lab Encounters per 1000 Episodes	1,071	1,704	2,573	2,679	621	2,900	2,807	3,571	2,538	1,751

MRI Encounters per 1000 Episodes	1	1	1	0	2	16	1	2	-	1
ER Visits per 1000 Episodes	148	80	252	146	95	41	129	106	43	119
Inpatient Days per 1000 Episodes	900	1,347	475	2,344	2,092	783	2,328	1,794	591	1,885
Admissions per 1000 Episodes	196	169	98	261	242	190	286	373	122	250

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: CHF

	ETG Base=386800 (CHF)				
	Severity				
	1	2	3	4	Total
Cardiology Peer Definition					
# of Episodes	1,647	1,462	2,295	979	6,384
Total Cost per Episode	$ 1,105	$ 1,957	$ 3,934	$ 8,103	$ 3,391
Primary Care Core Cost per Episode	$ 46	$ 53	$ 69	$ 121	$ 67
Specialty Care Cost per Episode	$ 428	$ 676	$ 1,097	$ 1,940	$ 957
ER Cost per Episode	$ 21	$ 35	$ 52	$ 108	$ 49
Radiology Cost per Episode	$ 69	$ 61	$ 71	$ 64	$ 67
Pharmacy Cost per Episode	$ 202	$ 175	$ 212	$ 190	$ 197
Laboratory Cost per Episode	$ 41	$ 60	$ 100	$ 169	$ 86
Hospital Services Cost per Episode	$ 298	$ 897	$ 2,334	$ 5,511	$ 1,967

	ETG Base=386800 (CHF)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	2,439	2,218	2,991	1,600	9,249
Total Cost per Episode	$ 1,117	$ 1,870	$ 3,788	$ 8,899	$ 3,508
Primary Care Core Cost per Episode	$ 103	$ 117	$ 139	$ 220	$ 138
Specialty Care Cost per Episode	$ 312	$ 580	$ 1,138	$ 2,500	$ 1,022
ER Cost per Episode	$ 41	$ 57	$ 91	$ 182	$ 86
Radiology Cost per Episode	$ 56	$ 51	$ 54	$ 89	$ 60
Pharmacy Cost per Episode	$ 161	$ 155	$ 157	$ 153	$ 157
Laboratory Cost per Episode	$ 46	$ 69	$ 109	$ 218	$ 102
Hospital Services Cost per Episode	$ 397	$ 840	$ 2,102	$ 5,537	$ 1,944

	ETG Base=386800 (CHF)				
	Severity				
	1	2	3	4	Total
Internal Medicine Peer Definition					
# of Episodes	4,334	4,065	5,411	3,059	16,870
Total Cost per Episode	$ 1,046	$ 1,885	$ 4,284	$ 10,834	$ 4,062
Primary Care Core Cost per Episode	$ 97	$ 104	$ 133	$ 204	$ 130
Specialty Care Cost per Episode	$ 308	$ 550	$ 1,057	$ 2,587	$ 1,020
ER Cost per Episode	$ 32	$ 49	$ 95	$ 196	$ 86
Radiology Cost per Episode	$ 37	$ 40	$ 62	$ 81	$ 54

Pharmacy Cost per Episode	$ 190	$ 164	$ 177	$ 173	$ 176
Laboratory Cost per Episode	$ 38	$ 45	$ 95	$ 193	$ 86
Hospital Services Cost per Episode	$ 344	$ 932	$ 2,664	$ 7,399	$ 2,509

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: CHF

	ETG Base=386800 (CHF)				
	Severity				
	1	2	3	4	Total
Cardiology Peer Definition					
# of Episodes	1,647	1,462	2,295	979	6,384
Specialist Visits per 1000 Episodes	2,101	2,864	3,973	9,047	4,014
Radiology Encounters per 1000 Episodes	356	521	717	1,657	723
Laboratory Encounters per 1000 Episodes	1,345	1,427	1,772	2,465	1,689
MRI Encounters per 1000 Episodes	1	4	3	2	3
ER Visits per 1000 Episodes	42	59	68	117	67
Admission Days per 1000 Episodes	121	453	916	3,195	954
Number of Admissions per 1000 Episodes	40	99	160	370	147
Number of Prescriptions per 1000 Episodes	6,502	5,765	6,839	7,014	6,533
Number of Generic Prescriptions per 1000 Episodes	5,528	4,873	5,900	6,211	5,617

	ETG Base=386800 (CHF)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	2,439	2,218	2,991	1,600	9,249
Specialist Visits per 1000 Episodes	1,802	2,529	4,121	10,506	4,232
Radiology Encounters per 1000 Episodes	413	618	834	2,027	878
Laboratory Encounters per 1000 Episodes	1,907	2,107	2,311	3,065	2,286
MRI Encounters per 1000 Episodes	1	1	2	2	1
ER Visits per 1000 Episodes	78	95	125	271	131
Admission Days per 1000 Episodes	451	603	1,326	3,986	1,382
Number of Admissions per 1000 Episodes	65	124	226	516	209
Number of Prescriptions per 1000 Episodes	7,183	6,263	6,734	6,636	6,723
Number of Generic Prescriptions per 1000 Episodes	6,276	5,338	5,964	5,843	5,875

	ETG Base=386800 (CHF)				
	Severity				
	1	2	3	4	Total
Internal Medicine Peer Definition					
# of Episodes	4,334	4,065	5,411	3,059	16,870
Specialist Visits per 1000 Episodes	1,848	2,718	4,783	12,519	4,934
Radiology Encounters per 1000 Episodes	343	572	945	2,269	940
Laboratory Encounters per 1000 Episodes	1,402	1,510	1,827	2,434	1,751
MRI Encounters per 1000 Episodes	1	1	2	1	1
ER Visits per 1000 Episodes	61	80	125	245	119

Admission Days per 1000 Episodes	529	861	1,712	5,470	1,885
Number of Admissions per 1000 Episodes	63	125	268	647	250
Number of Prescriptions per 1000 Episodes	6,442	6,083	6,567	6,979	6,493
Number of Generic Prescriptions per 1000 Episodes	5,459	5,230	5,710	6,171	5,614

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: CHF

	Data Source									
	HCO: A	**HCO: B**	**HCO: C**	**HCO: D**	**HCO: E**	**HCO: F**	**HCO: G**	**HCO: H**	**HCO: J**	**Total**
% Complete Episodes	83.91%	82.15%	77.90%	84.51%	81.85%	82.11%	81.72%	83.15%	81.84%	82.47%
% Incomplete Episodes	16.09%	17.85%	22.10%	15.49%	18.15%	17.89%	18.28%	16.85%	18.16%	17.53%
% Non-Outliers Episodes	89.30%	89.48%	84.52%	88.91%	89.16%	87.13%	77.92%	87.64%	88.64%	87.86%
% Hi Outliers Episodes	2.72%	5.18%	10.33%	2.01%	3.57%	5.65%	2.29%	3.79%	4.31%	4.08%
% Lo Outliers Episodes	7.98%	5.34%	5.14%	9.08%	7.27%	7.22%	19.79%	8.57%	7.05%	8.07%
% Non-Outliers + Hi Outliers Episodes	92.02%	94.66%	94.86%	90.92%	92.73%	92.78%	80.21%	91.43%	92.95%	91.93%
% Episodes Eligible for Attribution	77.19%	77.57%	73.64%	76.84%	75.91%	76.19%	66.24%	76.06%	76.09%	75.81%

Notes:
Data is based on the analysis of 9 Health Care Organizations (HCO) totaling more than 48 million episodes
Episodes are defined as either Complete or Incomplete according to ETG Methodology. See response for SA3.1 for additional details on Episode completion
Episodes are defined as Outliers according to the ETG Trim Point Methodology. See response for SA3.1 for additional details on Outlier Episodes
Episodes Eligible for Attribution represents episodes that are Complete, Non-Outliers or Hi Outliers, applicable for a peer group based upon the episode ETG.

A Physician Profile
Presented by Ingenix Impact Intelligence

Specialty Patterns of Care

For the 12 Months
Ending 12/31/2007

Physician		Number of Episodes:	93
Name:	Provider 6388502012	Case Mix, Episodes:	0.48
		Peer Group	
Primary ID:	6388502012	Peer Group Number of Episodes:	5,430
		Peer Group Name:	II Cardiology
Specialty:	Cardiology	Key Statistics	
		Overall Quality Index:	1.02
		Overall Cost Index, Episodes:	1.14
		Confidence Intervals for the Index	
		Overall Quality Index:	No data available
		Overall Cost Index, Episodes:	No data available

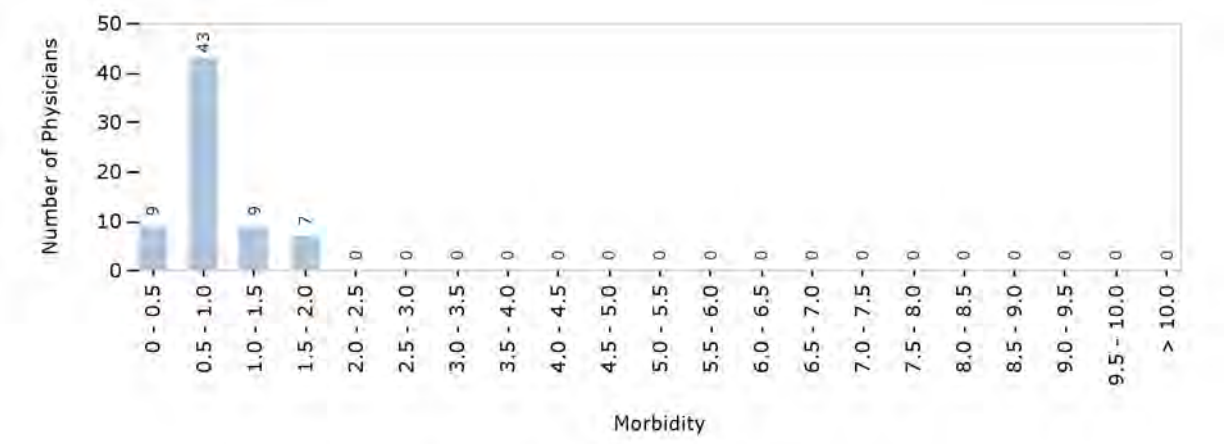
Statistical significance of difference between index and peer group average: * p<0.10; ** p < 0.05

Episode Case Mix Summary

Top 10 ETGs, by Total Cost (Completed Episodes of Care)

	Episodes			Encounters (Per 1000 Episodes)	
ETG Family Description	Episodes	Specialist's Cost / Episode	Peers Cost / Episode	Specialist's Encounters / 1000 Episode	Peers Encounters / 1000 Episode
Hypertension	43	$1,569.36	$1,228.51	14,779	12,844
Hyperlipidemia, other	19	$720.64	$631.67	7,169	6,829
Ischemic heart disease	9	$1,511.63	$2,378.04	12,889	13,765
Valvular disorder	14	$818.25	$1,047.19	4,367	7,315
Cardiomyopathy	3	$2,407.90	$1,340.66	16,583	14,088
Pulmonary embolism	1	$3,244.43	$3,897.41	38,714	24,716
Congestive heart failure	1	$2,817.56	$1,496.61	6,600	14,084
Atherosclerosis	2	$702.92	$387.57	1,500	1,125
Atrial fibrillation & flutter	1	$507.36	$1,715.52	25,500	21,127
All Others	0	--	--	--	--
All Episodes	93	$1,304.04	$1,211.06	11,523	10,879

Relative Morbidity Histogram

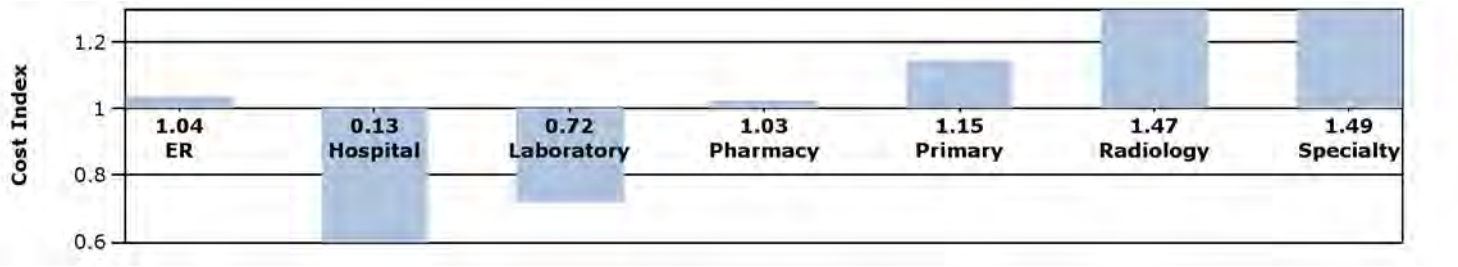

Number of Physicians
50
40
30
20
10
0
9
43
9
7
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 2.5
2.5 - 3.0
3.0 - 3.5
3.5 - 4.0
4.0 - 4.5
4.5 - 5.0
5.0 - 5.5
5.5 - 6.0
6.0 - 6.5
6.5 - 7.0
7.0 - 7.5
7.5 - 8.0
8.0 - 8.5
8.5 - 9.0
9.0 - 9.5
9.5 - 10.0
> 10.0
Morbidity

Quality Measures

As of the End of the Report Period
(Members Must be Continuously Enrolled with Plan a Minimum of 12 Months)

	Number of Quality Opportunities		Rates		Index
	With Compliance	Total	Provider Rate	Peer Rate	Quality Index
Cardiology					
HTN					
Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.	12	15	0.80	0.81	0.99
HTN					
Pt(s) taking an NSAID med.	21	23	0.91	0.92	0.99
HTN					
Pt(s) that had an annual physician visit.	23	23	1.00	0.97	1.03
HTN					
Pt(s) that had a serum creatinine in last 12 rpt mos.	19	23	0.83	0.80	1.03
CAD					
Pt(s) conon 2 meds (nitrate and phosphodiesterase type 5 inhibitor) w/ interacting properties.	6	6	1.00	1.00	1.00
CAD					
Pt(s) that had an OV for CAD care in last 12 rpt mos.	6	6	1.00	0.97	1.03
Endocrinology					
Hyperlipidemia					
Pt(s) taking a statin-containing med, nicotinic acid or fibric acid derivative that had an annual serum ALT or AST test.	10	10	1.00	0.92	1.09
Hyperlipidemia					
Pt(s) w/ a LDL cholesterol test in last 12 rpt mos.	16	16	1.00	0.90	1.12
Hyperlipidemia					
Pt(s) w/ the most recent LDL result <160mg/dL.	4	5	0.80	0.93	0.86
Hyperlipidemia					
Pt(s) w/ a HDL cholesterol test in last 12 rpt mos.	16	16	1.00	0.90	1.11
Hyperlipidemia					
Pt(s) w/ the most recent HDL result >= 40mg/dL.	1	5	0.20	0.68	0.29
Hyperlipidemia					
Pt(s) w/ a triglyceride test in last 12 rpt mos.	16	16	1.00	0.90	1.12
Total	150	164	0.91	0.89	1.03

Cost Index Summary, by Service Category



Cost and Utilization Summary Measures

Profiled Costs

	Actual Encounters	Peers Encounters	Actual Cost / Episode	Peers Cost / Episode	Cost / Episode Index	Actual Total Cost
ER	5	4	$53.98	$52.08	1.04	$5,020
Facility	3	2	$45.42	$45.48		$4,224
Professional	2	2	$8.56	$6.59		$796
Hospital Services	8	17	$29.49	$227.90	0.13	$2,743
Inpatient Facility	0	2	$0.00	$108.97		$0
Outpatient Hospital Surgery	0	2	$0.00	$57.97		$0
Laboratory	40	51	$19.29	$26.93	0.72	$1,794
Facility	0	3	$0.00	$6.96		$0
Professional	40	48	$19.29	$19.97		$1,794
Pharmacy	492	499	$271.71	$264.70	1.03	$25,269
Anti-Infective Agents	4	5	$0.37	$1.51		$35
Cardiovascular agents	359	393	$221.64	$227.13		$20,613
Primary Care Core	119	104	$68.41	$59.66	1.15	$6,362
PCC Diagnostic	57	61	$18.70	$28.57		$1,739
Radiology	34	27	$210.93	$143.69	1.47	$19,617
Facility	1	3	$2.51	$25.55		$234
Professional	34	24	$208.42	$118.14		$19,383
Specialty Care	373	309	$650.24	$436.10	1.49	$60,472
Medical Specialty	354	287	$606.05	$402.22		$56,363
PCP Specialty	1	3	$0.22	$3.31		$21
Surgical Specialty	3	4	$1.38	$4.23		$129
Total	1,072	1,012	$1,304.04	$1,211.06	1.08	$121,276

Overall Cost Index: 1.14

Utilization Rates Per 1,000 Episodes

	Actual	Peers	Index
Specialist Visit Rate	1,387	1,407	0.99
Other Specialty Care Rate	839	616	1.36
Radiology Procedure Rate	391	365	1.07
MRI Procedure Rate	0	3	0.00
Laboratory Procedure Rate	908	887	1.02
Overall Prescribing Rate	5,290	5,360	0.99
Generic Prescribing %	0%	0%	--
ER Visit Rate	48	41	1.19
Admits per 1000 Episodes	0	25	0.00
Days per 1000 Episodes	0	63	0.00
Average Length of Stay	--	2.50	0.00

Episode Detail and Analysis

Atherosclerosis

Total Specialty Episode Costs: $1,406

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	2	$702.92	$0.00	$702.92	$0.00	$0.00	$0.00	$0.00	$0.00
Peers		$387.57	$0.00	$387.57	$0.00	$0.00	$0.00	$0.00	$0.00
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			0	1,500	0	0	0	0	0
Peers			0	1,125	0	0	0	0	0
Index			--	--	--	--	--	--	--

Atrial fibrillation & flutter

Total Specialty Episode Costs: $507

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	1	$507.36	$6.20	$106.50	$25.66	$0.00	$75.58	$293.43	$0.00
Peers		$1,715.52	$35.87	$465.51	$46.52	$69.43	$459.09	$533.92	$105.18
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			1,000	9,000	3,500	0	1,000	11,000	0
Peers			1,435	6,459	2,597	208	319	9,968	141
Index			--	--	--	--	--	--	--

Cardiomyopathy

Total Specialty Episode Costs: $7,224

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	3	$2,407.90	$32.88	$1,410.90	$2.32	$0.00	$613.18	$348.61	$0.00
Peers		$1,340.66	$19.72	$515.26	$49.66	$109.92	$300.36	$345.74	$0.00
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			1,333	3,750	167	0	1,000	10,333	0
Peers			511	3,479	736	205	379	8,779	0
Index			--	--	--	--	--	--	--

Congestive heart failure

Total Specialty Episode Costs: $2,818

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	1	$2,817.56	$0.00	$655.48	$28.58	$682.19	$384.57	$0.00	$1,066.73
Peers		$1,496.61	$27.44	$714.02	$20.78	$106.20	$314.81	$286.36	$26.99
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			0	4,000	100	1,000	1,000	0	500
Peers			854	3,447	349	243	269	8,881	41
Index			--	--	--	--	--	--	--

Hyperlipidemia, other

Total Specialty Episode Costs: $13,932

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	19	$720.64	$38.46	$188.41	$20.36	$35.22	$0.00	$421.22	$16.97
Peers		$631.67	$28.58	$106.52	$34.61	$37.56	$9.55	$409.05	$5.80
Index			1.35	1.77	0.59	0.94	0.00	1.03	2.93
Encounters per 1000 Episodes									
Actual			719	1,748	719	52	0	3,879	52
Peers			581	1,180	788	60	13	4,203	5
Index			1.24	1.48	0.91	0.86	0.00	0.92	11.35

Hypertension

Total Specialty Episode Costs: $67,221

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	43	$1,569.36	$88.65	$760.21	$27.68	$311.39	$7.03	$324.61	$49.79
Peers		$1,228.51	$75.29	$468.78	$19.68	$188.49	$148.75	$266.33	$61.20
Index			1.18	1.62	1.41	1.65	0.05	1.22	0.81
Encounters per 1000 Episodes									
Actual			1,474	4,513	275	533	47	7,891	47
Peers			1,401	3,557	298	364	156	7,021	46
Index			1.05	1.27	0.92	1.46	0.30	1.12	1.02

Ischemic heart disease

Total Specialty Episode Costs: $13,605

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	9	$1,511.63	$160.14	$759.84	$7.31	$381.47	$0.00	$202.87	$0.00
Peers		$2,378.04	$45.89	$672.60	$29.37	$278.61	$978.17	$288.30	$85.11
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			2,935	5,500	176	611	0	3,667	0
Peers			1,218	5,527	684	613	541	5,077	106
Index			--	--	--	--	--	--	--

Valvular disorder

Total Specialty Episode Costs: $11,319

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	14	$818.25	$17.60	$679.04	$0.90	$106.43	$10.24	$4.04	$0.00
Peers		$1,047.19	$32.37	$590.16	$14.37	$108.66	$179.66	$61.34	$60.62
Index			0.54	1.15	0.06	0.98	0.06	0.07	0.00
Encounters per 1000 Episodes									
Actual			428	3,217	145	217	72	289	0
Peers			828	3,654	448	225	245	1,854	61
Index			0.52	0.88	0.32	0.96	0.29	0.16	0.00

Member Quality Non-Compliance List

Member ID	Member Name	Date of Birth	Gender	Age	Condition	Case	Rule
0231115813		3/25/1957	M	49	Cardiology	HTN	Pt(s) taking an NSAID med.
1576957219		9/21/1956	M	50	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
1722584502		3/16/1959	F	47	Cardiology	HTN	Pt(s) taking an NSAID med.
3510814590		8/22/1968	M	38	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
5095625983		1/7/1951	F	55	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent LDL result <160mg/dL.
5095625983		1/7/1951	F	55	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
6189711566		7/4/1953	M	53	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
6189711566		7/4/1953	M	53	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
7310373120		4/9/1960	M	46	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
8090910733		6/10/1963	F	43	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
8090910733		6/10/1963	F	43	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
8365387487		11/5/1952	M	54	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
8577199106		6/16/1948	M	58	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
8577199106		6/16/1948	M	58	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.

Report Introduction and Interpretation

Patterns of Care

Episode Case Mix Summary

Panel Morbidity - Peer Distribution

Quality

Cost and Use

Episode Detail

Member Quality Non-Compliance

NATIONAL QUALITY FORUM

Resource Use Measure Evaluation 1.0
January 2011

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

Resource Use Definition:

- Resource use measures are broadly applicable and comparable measures of input counts—(in terms of units or dollars)-- applied to a population or population sample
- Resource use measures count the frequency of specific resources; these resource units may be monetized, as appropriate.
- The approach to monetizing resource use varies and often depends on the perspective of the measurer and those being measured. Monetizing resource use allows for the aggregation across resources.

NQF Staff: NQF staff will complete a preliminary review of the measure to ensure conditions are met and the form has been completed according to the developer's intent. Staff comments have been highlighted in green.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas)*.

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the subcriteria are met (TAP or Steering Committee)
High (H) – based on the information submitted, there is high confidence (or certainty) that the criterion is met
Moderate (M) – based on the information submitted, there is moderate confidence (or certainty) that the criterion is met
Low (L) - based on the information submitted, there is low confidence (or certainty) that the criterion is met
Insufficient (I) – there is insufficient information submitted to evaluate whether the criterion is met, e.g., blank, incomplete, or information is not relevant, responsive, or specific to the particular question (unacceptable)
Not Applicable (NA) - Not applicable (only an option for a few subcriteria as indicated)

Evaluation ratings of whether the measure met the overall criterion (Steering Committee)
Yes (Y)- The overall criteria has been met
No (N)-The overall criterion has NOT been met
High (H) – There is high confidence (or certainty) that the criterion is met
Moderate (M) – There is moderate confidence (or certainty) that the criterion is met
Low (L) - There is low confidence (or certainty) that the criterion is met

Recommendations for endorsement (Steering Committee)
Yes (Y) – The measure should be recommended for endorsement
No (N)-The measure should NOT be recommended for endorsement
Abstain (A)- Abstain from voting to recommend the measure

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
Staff Reviewer Name(s):	
NQF Review #: 1594	**NQF Project:** Endorsing Resource Use Standards- Phase II

BRIEF MEASURE INFORMATION

Measure Title: Measure Name: ETG Based Coronary Artery Disease (CAD) resource use measure

Measure Steward (IP Owner): Ingenix, 950 Winter Street, suite 3800, Waltham, Massachusetts, 02451

Brief description of measure: The measure focuses on resources used to deliver episodes of care for patients with CAD. CAD episodes are defined using the Episode Treatment Groups (ETG) methodology and describe the unique presence of the condition for a patient and the services involved in diagnosing, managing and treating CAD. A number of resource use measures are defined for CAD episodes, including overall cost of care, cost of care by type of service, and the utilization of specific types of services. Each resource use measure is expressed as a cost or a utilization count per episode and comparisons with internal and external benchmarks are made using risk adjustment to support valid comparisons.
As requested by NQF, the focus of this submission is for CAD episodes and will cover both measures at the CAD base and severity level and also a CAD composite measure where CAD episode results are combined across CAD severity levels. At the most detailed level, the measure is defined as the base condition of CAD and an assigned level of severity (e.g., resources per episode for CAD, severity level 1 episodes). Composite measures can then be created using these measurement units to meet a specific need. For example, a composite measure for CAD is derived by combining CAD episode results across CAD severity levels. Appropriate risk adjustment is applied to support comparisons (e.g., for physician measurement, adjusting for a physician's mix of CAD episodes by severity level when supporting a CAD composite comparison).

The focus of this measure is on CAD. However, CAD episode results could also be included in an "cardiology", "chronic care", or other clinical composite for a physician, combining episodes in clinical areas similar to CAD. Further, an "overall" composite for a physician can be created, again by aggregating episode results across appropriate conditions and severity levels and applying proper risk adjustment when making comparisons.

Resource use service categories: Inpatient services: Inpatient facility services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department
Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

Brief description of measure clinical logic: This measure identifies patients with CAD and creates CAD episodes of care using the ETG methodology described in the ETG Construction Logic attached in our response to S.2. Each episode of CAD is characterized by an ETG Base class ID that specifies the type of condition; the ETG Base class ID representing CAD is 386500.

An episode of CAD will contain all clinically relevant information related to the condition. In addition to this information, certain diagnoses are considered co-morbidities or condition status factors for CAD. For example, Acute Myocardial Infarction is a condition status factor and Congestive Heart Failure is a comorbidity for CAD.

Each episode is assigned a severity level based on age, gender and the observed comorbidity and condition status factors. The severity level is an indicator of the relative resources expected to be required for the given episode of CAD.

The CAD episode clinical framework is defined by the services, or claim lines, that can begin an episode, the primary and incidental diagnosis relationships involved, how records group to an episode, including relative strength of relationship, and the severity logic employed.

If included in a composite or paired with another measure, please identify composite or paired measure:

Subject/ Topic Areas: Cardiovascular

Type of resource use measure: Per episode
Data Type: Administrative claims Other

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. Measure Steward Agreement. ***The measure is in the public domain or an intellectual property (measure steward agreement) is signed. Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*** **A.1.Do you attest that the measure steward holds intellectual property rights to the measure? (If no, do not submit)** Yes **A.2. Please check if either of the following apply:** Proprietary measure **A.3. Measure Steward Agreement.** Agreement signed and submitted **A.4. Measure Steward Agreement attached:** NQF Resource Use Addendum FINAL-634362973573925734.pdf	**A** **Y☐** **N☐**
B. Maintenance. ***The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. (If no, do not submit)*** Yes, information provided in contact section	**B** **Y☐** **N☐**
C. Purpose/ Use *(All the purposes and/or uses for which the measure is specified and tested:* Payment Program Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations)	**C** **Y☐** **N☐**
D. Testing. ***The measure is fully specified and tested for reliability and validity (See guidance on measure testing).*** Yes, reliability and validity testing completed	**D** **Y☐** **N☐**
E. Harmonization and Competing Measures. ***Have NQF-endorsed measures been reviewed to identify if there are related or competing measures? (List the NQF # and title in the section on related and competing measures)*** Yes ***E.1.*Do you attest that measure harmonization issues with related measure (either the same measure**	**E** **Y☐** **N☐**

focus or the same target population) have been considered and addresses as appropriate? (List the NQF # and title in the section on related and competing measures) Yes *E.2.Do you attest that competing measures (both the same measure focus and the same target population) have been considered and addressed where appropriate?* Yes	
F. Submission Complete. ***The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.***	**F** **Y☐** **N☐**
Have all conditions for consideration been met? **Staff Notes to Steward** (*if submission returned*)**:**	**Y ☐** **N ☐**
Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**	
File Attachments Related to Measure/Criteria: Attachment: ETG Construction Logic CAD.doc Attachment: S5_CAD_DataDictionary.xls Attachment: S5_CAD_DataDictionary-634387134077553255.xls Attachment: S6_DataProtocol-634387134163022552.xls Attachment: S7.2_Data Source Reference-634387135181622821.xls Attachment: S8_CAD_ClinicalLogic.xls Attachment: Attachment: S9.7_RU_Categories.xls Attachment: S10_Risk Adjustment Method Example.xls S12_sample_score_report_EPI-634387141970885022.pdf Attachment: SA_Reliability_Validity Testing_CAD.xls	

IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in performance. **Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All subcriteria must be met to pass this criterion.**	**Eval Rating**
High Impact **IM1. Demonstrated high impact aspect of healthcare:** Affects large numbers A leading cause of morbidity/mortality High resource use Other The risk of Americans developing and dying from cardiovascular disease would be substantially reduced if major lifestyle improvements were made across the U.S. population in diet and physical activity, control of high blood pressure and cholesterol, smoking cessation, and appropriate aspirin use. **IM1.1. Summary of evidence of high impact:** Coronary artery disease, also known as coronary heart disease, is the most common type of "heart disease". Heart disease is the leading cause of death for both men and women. Half of the deaths due to heart disease in 2006 were in women1. In 2006, a total of 631,636 people in the United States died of heart disease. In the United States, someone has a heart attack every 34 seconds. Each minute, someone in the United States dies from a heart disease-related event2. Heart disease is the leading cause of death for people of most racial/ethnic groups in the United States, including African	**1a** **H☐** **M☐** **L☐** **I☐**

Americans, American Indians or Alaska Natives, Hispanics, and whites. For Asian Americans, heart disease is second only to cancer3.
Nine out of 10 heart disease patients have at least one risk factor2. Several medical conditions and lifestyle choices can put people at a higher risk for heart disease, including:

- High cholesterol
- High blood pressure
- Diabetes
- Cigarette smoking
- Overweight and obesity
- Poor diet
- Physical inactivity
- Alcohol use

Analyses of Ingenix healthcare benchmark data for a large population of individuals can support an understanding of the importance of CAD and the measurement of resource use. Using a 12-month sample population of more than 7 million individuals (primarily non-elderly) from 9 health care organizations, patients with CAD were identified using diagnosis codes assigned to medical administrative claim records. The percentage of costs for these patients related to CAD and other conditions was also estimated using ETG grouped data for the identified CAD patients. Using this benchmark data, 1.7% of the total population was identified as having CAD. Total cost per member per month for these individuals was $2,208. Approximately 42% of the total costs for the members identified with CAD were identified as being related to CAD (based on total costs grouped to those condition episodes for those patients). Diabetes, hypertension, high cholesterol and cerebrovascular disease related services comprise an additional 13% of the total costs for treating patients with CAD.
Analyses of the Ingenix healthcare benchmark data described above for episodes attributed to internal medicine physicians can further support an understanding of the relative financial importance of resource use measures for the condition. As shown below, across all physician episodes, the average total cost per episode is approximately $4,000. Specialty, Pharmacy and Hospital Services comprise the largest component of costs for these episodes.

CAD

# of Episodes	74,773

Cost per Episode:

Total Cost per Episode	$3,942
Primary Care Core Cost per Episode	$139
Specialty Care Cost per Episode	$862
ER Cost per Episode	$71
Radiology Cost per Episode	$163
Pharmacy Cost per Episode	$613
Laboratory Cost per Episode	$48
Hospital Services Cost per Episode	$2,046

Utilization per 1,000 Episodes:

Specialist Visits per 1000 Episodes	3,670
Radiology Encounters per 1000 Episodes	630
Laboratory Encounters per 1000 Episodes	1,153
ER Visits per 1000 Episodes	104
Admission Days per 1000 Episodes	636
Number of Admissions per 1000 Episodes	160
Number of Prescriptions per 1000 Episodes	7,851

IM1.2. Citations for evidence of high impact cited in IM1.1.:

1Heron MP, Hoyert DL, Murphy SL, Xu JQ, Kochanek KD, Tejada-Vera B. Deaths: Final data for 2006 [PDF–2.3M]. National Vital Statistics Reports; Vol. 57 No. 14. Hyattsville, MD: National Center for Health Statistics. 2009.
2Lloyd-Jones D, Adams RJ, Brown, TM, et al. Heart Disease and Stroke Statistics—2010 Update. A Report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee.* Circulation. 2010;121:e1-e170.
3Heron MP. Deaths: Leading causes for 2004 [PDF–3.2M]. National Vital Statistics Reports; Vol. 56 No. 5. Hyattsville, MD: National Center for Health Statistics. 2007.

4 Centers for Disease Control and Prevention. Heart disease fact sheet: national estimates and general information on heart disease in the United States, 2010. Atlanta, GA [Internet]: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. Available at http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_disease.htm. Accessed on February 1, 2011.

IM2. Opportunity for Improvement

IM2.1. Briefly explain the benefits envisioned by use of this measure:

Benefits envisioned by this set of measures relates to identifying opportunities and measuring value. In particular, the measure and its components can support:
-The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and

-Measurement of the value delivered by individual providers, provider groups, and delivery
Systems, in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.

IM2.2. Summary of data demonstrating variation across providers or entities:

The variation in resource use across providers can be demonstrated using actual measures of physician performance for the condition episodes.

Data to explore this question were extracted from the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used for this analysis was primarily for commercial non-elderly individuals and covered the years 2009 thru 2010. In particular, data for 9 health care organizations including 7 million members were selected. The information was processed to produce CAD episodes. Incomplete and low cost outlier episodes were excluded. High cost outlier episodes were truncated at the high outlier threshold level. Episodes were attributed to providers in relevant specialties (peer groups).

The observed and expected costs for CAD episodes were computed, with expected costs based on averages for a provider's peers, adjusted to reflect the providers mix of CAD episodes by severity level. In particular, the following steps were performed:
-Computed the observed experience for the provider being measured, across all episodes to be included in the comparison;

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-Computed the experience for the provider's peers. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peer benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed.;

-Compared the observed experience to the expected result. This expected result is based on the peers average level of performance, adjusted to reflect the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio (O/E ratio) and is a risk adjusted measure. A ratio above 1.00 indicates greater resource use than peers, less than 1.00 lower resource use.

Variation in the O/E ratio across providers was assessed. In this way comparisons or relative resource use can be made, removing differences in the underlying mix of episodes included. Providers with greater than 20 CAD episodes were selected. For CAD, 1,726 providers and 77,596 episodes were included covering the specialties of internal medicine, family practice and cardiology. The providers in each specialty were compared with their peers only (same specialty and

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same enrolled population for the healthcare organization). However, OE results were aggregated across healthcare organizations and specialties to summarize variation.

The observed variation in cost of care performance can be summarized using the inter-quartile range for the O/E ratio (the difference between the 25th and 75th percentile physician OE ratios). The results showed variation in performance across these measure physicians. In particular, the inter-quartile range for the O/E ration for the following key measures was approximately: (e.g., 0.60 can be interpreted as 40 percent below peers, 1.40 as 40 percent above peers)

- Total Cost per Episode – 0.71 to 1.22
- Specialty Care Cost per Episode – 0.61 to 1.06
- Pharmacy Prescriptions per Episode – 0.76 to 1.20

As shown, the variation observed across providers is significant.

IM2.3. Citations for data on variation:

The results described in IM2.2 are based on empirical analysis of available data on physician measurement. Other references to studies on the variation in resource use across populations and localities are available. Selected references on variation are included below:

Variations in per capita spending - Inpatient-based and specialist-oriented pattern of practice
Regional differences in Medicare spending are largely explained by the more inpatient-based and specialist-oriented pattern of practice observed in high-spending regions. Neither quality of care nor access to care appear to be better for Medicare enrollees in higher-spending regions.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care. Ann Intern Med . 2003 138(4): 273-287.
The Dartmouth Atlas shows a more than two-fold variation in per capita Medicare spending in different regions of the country. Adjusting for price differences leads to only a modest decline in overall variations. It is utilization -- the amount of care delivered to patients -- that explains most of the regional variation in Medicare spending. Most spending variation was due to differences in use of the hospital as a site of care (versus, say, hospice, nursing home, or the doctor's office) and to discretionary specialist visits and tests.

Reflections on variations, The Dartmouth Atlas Of Health Care. Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=1338. Accessed on February 12, 2011.

Variations in clinical decision making – ambulatory care-sensitive conditions
Clinicians have identified a group of diagnoses referred to as "ambulatory care-sensitive" conditions – such as poorly controlled diabetes or worsening heart failure – which can be treated in either the inpatient or the outpatient setting, and for which hospitalization can often be prevented by better outpatient management. The variations among regions in admission rates of patients with these conditions can be ascribed to differences in clinical decision-making, rather than to differences in underlying illness rates. Hospitalization rates for these – and for most medical conditions – are also highly correlated with the local supply of hospital beds.
Hospital Discharges for Ambulatory Care-Sensitive Conditions Per 1,000 Medicare Enrollees, By Gender And Type Of Admission, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=20 Accessed on February 12, 2011.

Variations in the use of diagnostic tests and discretionary services
Variations in ECG ordering are not explained by patient characteristics. The tremendous nonclinical variations in ECG test ordering suggest a need for greater consensus about use of screening ECGs in primary care.
Randall SS, Bismruta M. Variation in routine electrocardiogram use in academic primary care practice. Arch Intern Med. 2001;161:2351-2355
Physicians in high-spending regions see patients back more frequently and are more likely to recommend screening tests of unproven benefit and discretionary interventions compared with physicians in low-spending regions; however, both appear equally likely to recommend guideline-supported interventions.

Physicians in higher-spending regions were much more likely than those in lower-spending regions to recommend discretionary services, such as referral to a subspecialist for typical gastroesophageal reflux or stable angina or, in another vignette, hospital admission for an 85-year-old patient with an exacerbation of end-stage congestive heart failure.

And they were three times as likely to admit the latter patient directly to an intensive care unit and 30% less likely to discuss palliative care with the patient and family. Differences in the propensity to intervene in such gray areas of decision making were highly correlated with regional differences in per capita spending.

Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary decision making by primary care physicians and the cost of U.S. health care. Health Aff (Milwood), 2008; 27:813-823
Widely varying levels of health care spending across the United States are strongly correlated with the tendency of local physicians to recommend discretionary interventions. Physicians in regions of differing spending appear to differ only in their discretionary decision making. For decisions that are informed by evidence or practice guidelines (such as screening mammography and standard exercise tolerance testing), physicians were equally likely to recommend interventions regardless of local spending levels
Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary Decision Making By Primary Care Physicians And The Cost Of U.S. Health Care. Health Aff (Millwood). 2008; 27(3): 813–823.
Supply sensitive care
Supply-sensitive care accounts for more than half of all Medicare spending. In regions where there are more hospital beds per capita, patients will be more likely to be admitted to the hospital. In regions where there are more intensive care unit beds, more patients will be cared for in the ICU. More specialists will result in more visits to specialists. And the more CT scanners are available, the more CT scans patients will receive. The Dartmouth Atlas has consistently demonstrated these relationships.

Patients do not experience improved survival or better quality of life if they live in regions with more care. In fact, the care they receive appears to be worse. They report being less satisfied with their care than patients in regions that spend less, and having more trouble getting in to see their physicians.

Supply sensitive care, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=2937 Accessed on February 14, 2011.
Numerous studies have found that higher bed supply is associated with more hospital use for conditions where outpatient care is a viable alternative. This includes most medical causes of hospitalization. In 2006, bed supply remained an important determinant of medical discharges.
The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. Annals of Internal Medicine. Feb 18 2003;138(4):273-287.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care. Annals of Internal Medicine. Feb 18 2003;138(4):288-298.
By far, the most significant factor associated with how much Medicare spends in any given region is the availability of medical resources. Studies from the Dartmouth Atlas Project have shown that the frequency with which physicians admit patients with chronic diseases to the hospital is highly correlated
with the number of beds per capita in the region. The frequency of visits to medical specialists is correlated with the number of specialists available. And the frequency with which chronically ill patients undergo many diagnostic tests and procedures also varies. We call such procedures and tests, along with the rates of hospitalization and physician visits, “supply-sensitive” care, or care that varies with the local availability of such medical resources as physicians, hospital beds, intensive care unit (ICU) beds, and diagnostic imaging equipment. The volume of supply-sensitive care that is delivered to the chronically ill is a powerful force driving Medicare spending. The utilization of supply-sensitive services for treating the chronically ill varies dramatically across different regions of the country, and it is responsible for much of Medicare spending. Local capacity, or the local supply of medical resources per capita, varies widely, and this local capacity bears directly on how much care is used to treat the chronically ill.

Wennberg JE, Fisher ES, Goodman DC, Skinner JS. “Tracking the care of patients with severe chronic illness.” The Dartmouth Atlas of Health Care 2008. Available at: http://www.dartmouthatlas.org/downloads/atlases/2008_Chronic_Care_Atlas.pdf Accessed on February 14, 2011.

IM2.4. Summary of data on disparities by population group:

Health disparities are defined as differences in the occurrence, frequency, death and burden of diseases and other unfavorable health conditions that exist among specific population groups1. Examining health care differences or gaps experienced by one population compared to another is an integral part of understanding and improving health care quality2. The quality of healthcare delivered within the United States also differs from population to population due to differences in access to care, healthcare utilization and other factors2.

Measures of healthcare utilization allow for a broader understanding of access to care2. Barriers to care that are associated with differences in healthcare utilization may have a more significant impact on healthcare quality than other factors2. Several studies on disparities have relied upon measures of healthcare utilization and the data demonstrates some of the most significant differences in care among diverse groups2. Current efforts to improve healthcare delivery continue to rely upon measures of health care utilization to fully understand the complexities surrounding disparate health care outcomes. For example, greater utilization of services does not necessarily indicate better care. In fact, high use of some inpatient services may reflect compromised access to outpatient health services2.

In 2006, the Nation's 14 million health service workers provided approximately 960 million office visits, 673 million hospital outpatient visits, treated 37 million hospitalized patients and 1.4 million nursing home residents2. Approximately 70% of the non-institutionalized civilian population visited a provider's medical office or outpatient facility and about 60% received a prescription medication2. National health expenditures totaled over $2 trillion dollars in fiscal year 2006 with 5% of the population accounting for 55% of total costs2. Additionally, almost one-third of all healthcare expenditures are estimated to be the result of low-quality care, including overuse, misuse and waste2. Utilization resource measures provide a mechanism to better understand healthcare delivery patterns in order to improve the health of all population groups.

The cost and use measures included in this submission will provide an approach to assessing disparities. For example, episode-based measures of cost and use can be employed to create severity-adjusted comparisons of the resources expended in treating cardiovascular conditions, including supporting a focus on the condition-related resources.

IM2.5. Citations for data on disparities cited in IM2.4:

1. Health Disparities in the United States: Facts and Figures, American Society of Clinical Oncology, 2009
2. National Healthcare Disparities Report, U.S. Department of Health & Human Services, Agency for Healthcare Research and Quality, 2008

IM3. Measure Intent

IM3.1. Describe intent of the measure and its components/ Rationale (including any citations) for analyzing variation in resource use in this way

As noted in IM2.1, the intent of the measure and its components is to support:
-The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and

-Measurement of the value delivered by individual providers, provider groups, and delivery systems, in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.

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IM4. Resource use service categories are consistent with measure construct

Refer to IM3.1. & all S9 items to evaluate this criteria.

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TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report*?

Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, met? Y☐ N☐
Rationale:

SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented.

MEASURE SPECIFICATIONS

Eval Rating 2a1/2b1

S1. Measure Web Page:
Do you have a web page where current detailed measure specifications can be obtained?

No

S2. General Approach
If applicable, summarize the general approach or methodology to the measure specification. This is most relevant to measures that are part of or rely on the execution of a measure system or applies to multiple measures.

All of our submitted measures for CAD rely on a foundational "episodes of care" concept that uses the Ingenix Episode Treatment Groups (ETG) methodology. Episode-based resource use measurement provides a representation of a patient's course of treatment for a specific condition. The attached ETG General Methods Construct Logic provides a high level explanation of our ETG concept and a summary of the ETG approach to creating episodes of care for CAD

Attachment: ETG Construction Logic CAD.doc

S3. Type of resource use measure:

Per episode

S4. Target Population:

S4.1. Subject/Topic Areas:

Cardiovascular

S4.2. Cross Cutting Areas *(HHS or NPP National health goal/priority)*

Care Coordination
Overuse

S5. Data dictionary or code table
Please provide a web page URL or attachment if exceeds 2 pages. NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less.

Data Dictionary:

URL:
Please supply the username and password:
Attachment: S5_CAD_DataDictionary.xls

Code Table:

URL:
Please supply the username and password:
Attachment: S5_CAD_DataDictionary-634387134077553255.xls

S6.Data Protocol (Resource Use Measure Module 1)

The measure developer must determine which of the following data protocol steps: data preparation, data inclusion criteria, data exclusion criteria, and missing data, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

Data Protocol Supplemental Attachment or URL:
If needed, attach document that supplements information provided for data protocol for analysis, data inclusion criteria, data exclusion criteria, and missing data (Save file as: S6_Data Protocol). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.

URL:
Please supply the username and password:
Attachment: S6_DataProtocol-634387134163022552.xls

S6.1. Data preparation for analysis
Detail (specify) the data preparation steps and provide rationale for this methodology.

Guidelines : Administrative medical and pharmacy claims, member enrollment and demographic information and provider characteristics describe the primary data sources used in creating ETG CAD episodes of care and measures of resource use per episode. The key data elements required to support ETG processing and the creation of resource use per episode measures for CAD are detailed in attachment S6_DataProtocol.

General recommendations for preparing data for ETG processing and the creation of resource use sub-measures are as follows:

-- The data for all required elements should be complete, valid and consistently populated. In particular:
-- Only final claims should be included in processing. Adjustments and pended/non-fully adjudicated claims should be removed;

-- All recorded diagnosis, procedure and NDC codes should be included and conform to standard ICD-9, HCPCS, CPT, NUBC revenue code and NDC coding conventions. Any non-standard, or "local" codes should be cross-walked to a valid code;

-- An assessment of the relative validity of diagnosis and procedural coding should be made. If significant differences in the prevalence or validity of diagnosis and procedural coding are observed across populations, data sources or administrative claims systems, these discrepancies should be validated and addressed, if relevant. If systematic discrepancies and data issues are the result of incomplete data, the members impacted by the incomplete information should be excluded from processing and measurement. An example is a defined population with significant evidence of missing or invalid coding or a population where primary care capitation is in place and claims or encounters for those services are not available;

-- Financial fields should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example;

-- An assessment of the relative validity of the financial information should be made. Systematic gaps in financial data should be validated and if resulting from incomplete data, the members impacted by the incomplete information should be excluded from processing. An example is a defined population with significant evidence of missing or invalid financial data where options are not available to estimate the financial amounts;

-- Inpatient facility claims should accurately represent the admission and discharge dates for the inpatient stay. Interim facility bills where the patient has not been discharged should reflect the time period of the services rendered and

captured on the interim bill.

-- The member IDs used to identify a member should be unique – describing an individual member. The member ID field across claims and membership should follow the same format. Duplicate IDs for a member are not recommended;

-- Each member enrollment record should describe a unique enrollment span, that is, the input data includes one row per member for each continuously enrolled period where the member has consistent attributes. A member may have multiple enrollment records reflecting a gap in enrollment or a change to their member attributes (i.e. PCP or Pharmacy Benefit) over time.

-- It is recommended that member enrollment span overlaps are reconciled prior to processing;

-- A member's pharmacy benefit status should be noted and reflects whether or not the member has pharmacy data generally available for use in measurement. Examples of populations where pharmacy data may not be available include the individual not have pharmacy coverage for the defined enrollment period or pharmacy services managed by a pharmacy benefits manager (PBM) and the PBM data has not been integrated with the medical claims;

-- The provider IDs used to identify a provider should be unique – describing an individual physician or other provider. The provider ID field across claims and membership (Assigned PCP) should follow the same format. Duplicate IDs for a provider are not recommended;

-- Each provider ID should be assigned a specialty that reflects the primary specialty of the provider. This information is used to support valid episode grouping and also to assign providers to an appropriate peer group to support episode analysis;

-- A place of service crosswalk table that maps each native place of service code to a standard format is required. Ingenix valid values include:
-- 11 – Office
-- 12 – Home
-- 21 – Inpatient Hospital
-- 22 – Outpatient Hospital
-- 23 – Emergency Room, Hospital
-- 24 – Ambulatory Surgical Center
-- 31 – Skilled Nursing Facility
-- 39 – Nursing Home, Custodial, Hospice
-- 49 – Ambulance
-- 51 – Inpatient Psychiatric Facility
-- 59 – Psychiatric Facility
-- 61 – Comprehensive Inpatient Facility
-- 69 – Rehab Facility
-- 81 – Independent Lab
-- 99 – Unknown or Other (this POS value should represent a small portion of the data for optimal results)
-- Provider Specialty on claims should accurately reflect the service category of the claim and support assignment of ETG Type of Provider for each claim. Type of Provider values used to support ETG processing include:
-- 0 – Clinician
-- 1 – Facility
-- 2 – Other
- Place of Service, Provider Specialty, CPT/HCPC Procedure Codes and Revenue codes should be accurate and support assignment of ETG Type of Service for each claim. Type of Service values used to support ETG processing include:
-- 0 – Ancillary
-- 1 – Medical/Surgical
-- 2 – Room and Board

S6.2.Data inclusion criteria
Detail initial data inclusion criteria and rationale(related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : In creating CAD episodes of care, ETG includes all claims for initial processing provided

the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG methodology does not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers, non-standard diagnosis or procedural coding and other invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

In terms of resource use measure construction following ETG grouping, no additional data inclusion criteria are applied. Only CAD episodes are included in the measurement of CAD episode-based resource use, including the individual services that ETG groups to those episodes. As noted below in section 6.3, it is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated appropriately.

S6.3. Data exclusion criteria
Detail initial data exclusion criteria and rationale (related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : As described in the submission for S6.2, for the application of ETG episode logic for CAD, ETG accepts all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG methodology does not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers, non-standard diagnosis or procedural coding and other invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

ETG does include logic to identify high or low cost outliers at the episode level. Although this is not the same as detailed service level data exclusions, inappropriately high individual claims or mispriced claims, in general, will impact the outlier treatment of the CAD episodes the claim is grouped to.

In terms of resource use measure construction following ETG grouping, no additional data exclusion criteria are applied. Only CAD episodes are included in the measurement of CAD episode-based resource use, including the individual services that ETG groups to those episodes. It is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated appropriately.

S6.4. Missing Data
Detail steps associated with missing data and rationale(e.g., any statistical techniques used)

Specifications : Missing provider specialty assignment will impact the ability to assign record type to a claim line. In addition invalid and incomplete diagnosis and procedure coding, will impact the results of the episode grouping and the measures for CAD. For example, inaccurate coding may result in a service record not grouping to a CAD episode – due to the miscoding of a CAD diagnosis or the procedure code assigned to the service. ETG will attempt to group these services. However, invalid data may prevent this grouping to happen in an appropriate way. In this way, ETG handles data quality issues through the rigor of the logic designed to create appropriate episodes.

In terms of working with missing information during the episode grouping process, ETG uses the following approaches:

-- Missing Diagnosis Codes: If all four diagnosis codes are missing from a non-pharmaceutical claim the ETG application will use the procedure code to group, except when the procedure code requires a valid diagnosis code to be present. This requirement is per the ETG eligibility table. In cases where all diagnosis codes are missing and the procedure requires a valid diagnosis code to also be present, the service record will not group to a CAD episode and will be assigned to an error ETG.

-- Missing Procedure Codes: If there is no procedure code on a service record then the record will group based on the diagnosis codes or NDC drug code. If there is no diagnosis, procedure or pharmacy code on the claim, then the claim will not group to a CAD episode and will have an error code assigned to it.

--Missing Provider Specialty: If the provider specialty is not available on a service record then the record will be assigned an error ETG code and will not group to a CAD episode.

The services not assigned to an episode and noted as “errors” based on missing data are marked with an error ETG

number. Services with these ETG numbers would not be included in a CAD episode or be used in episode-based resource measurement for CAD.

-- Missing Pharmacy Data: For some members and populations, pharmacy data can be missing generally, due to the different factors, including not having a pharmacy benefit with the entity collecting the data used in measurement or pharmacy services being managed by a pharmacy benefits manager (PBM) for the measurement entity. Where pharmacy data are not generally available for a member, adjustments are required to ensure valid comparisons.

The ETG grouping methodology for CAD itself does not require pharmacy data. Pharmacy services are treated as ancillary records and can never start an episode for CAD. Pharmacy services will join CAD episodes. However, missing pharmacy records will impact the observed cost of an episode – which will be underestimated, on average, where pharmacy data are missing. It is recommended that pharmacy benefit/data status be used as a separate category in risk adjusting pharmacy and total costs per episode. For example, the expected or "peer" results for a physician should reflect their mix of members with and without pharmacy benefits/data.

Eval Rating 2a1

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S7. Data Type: Administrative claims
Other

S7.1. Data Source or Collection Instrument
Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc.)

Both medical and pharmacy administrative service records (claims or encounters) are used to support the measures. Member enrollment span, pharmacy benefit status and age and gender are also required. Provider characteristics, including specialty and unique provider identifier also have importance to support episode grouping, attribution and definition of peers.

S7.2. Data Source or Collection Instrument Reference
(Please provide a web page URL or attachment). NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less)

URL:
Please supply the username and password:
Attachment: S7.2_Data Source Reference-634387135181622821.xls

Eval Rating 2b1

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S8.Measure Clinical Logic (Resource Use Measure Module 2)
The measure's clinical logic includes the steps that identify the condition or event of interest and any clustering of diagnoses or procedures. For example, the diagnoses and procedures that qualifies for a cardiac heart failure episode, including any disease interaction, comorbid conditions, or hierarchical structure to the clinical logic of the model. (Some of the steps listed separately below may be embedded in the risk adjustment description, if so, please indicate NA and in the rationale space list 'see risk adjustment details.')

Clinical Logic Supplemental Attachment or URL:
If needed, provide a URL or document that supplements information provided for the clinical framework, co-morbid interactions, clinical hierarchies, clinical severity levels, and concurrency of clinical events

URL:
Please supply the username and password:
Attachment: S8_CAD_ClinicalLogic.xls

S8.1. Brief Description of Clinical Framework
Briefly describe your clinical logic approach including clinical topic area, whether or not you account for comorbid and interactions, clinical hierarchies, clinical severity levels and concurrency of clinical events.

This measure identifies patients with CAD and creates CAD episodes of care using the ETG methodology described in the ETG Construction Logic attached in our response to S.2. Each episode of CAD is characterized by an ETG Base class ID that specifies the type of condition; the ETG Base class ID representing CAD is 386500.

An episode of CAD will contain all clinically relevant information related to the condition. In addition to this information, certain diagnoses are considered co-morbidities or condition status factors for CAD. For example, Acute Myocardial Infarction is a condition status factor and Congestive Heart Failure is a comorbidity for CAD.

Each episode is assigned a severity level based on age, gender and the observed comorbidity and condition status factors. The severity level is an indicator of the relative resources expected to be required for the given episode of CAD.

The CAD episode clinical framework is defined by the services, or claim lines, that can begin an episode, the primary and incidental diagnosis relationships involved, how records group to an episode, including relative strength of relationship, and the severity logic employed.

S8.2. Clinical framework
Detail any clustering and the assignment of codes, including the grouping methodology, the assignment algorithm, and relevant codes and rationale for these methodologies.

The CAD measure's episodes are defined using the Episode Treatment Group (ETG) methodology. Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_CAD. This attachment provides an overview of ETGs and a summary of the methodology used for CAD episodes.
- S5_CAD_DataDictionary (Excel workbook attachment). This attachment describes the clinical relationships between diagnosis and procedure codes and the episode condition.
- S8_CAD_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CAD methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

The individual Worksheets in these attachments that relate to the specific components of the methodology are referenced in the following specification.

The CAD ETG episode building process that supports CAD resource use measures has four important steps:
Step 1: Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
Step 2: Build Episodes from Anchor Records
Step 3: Group Non-Anchor Records to Episodes
Step 4: Finalize the Episodes (identify co-morbidities and complicating factors, and assign episode severity)

This section (S8.2 Clinical Framework) describes the first three steps in the episode building process. Sections S8.3 and S8.5 describe episode co-morbidities and condition status factors and episode severity.

Step 1- Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
Assign services to record types, identify anchor records and classify diagnoses and procedures on service records to support the creation of CAD and other episodes.

Step 1A: Assign Record Type to each Service:

Assign each service to one of the following 5 record types:

-- Facility: A claim record submitted by a treatment facility for room & board charges (F)
-- Surgery: A claim record submitted by a provider for surgical or related procedure (S)
-- Management: A claim record submitted by a provider related to the evaluation of a patient's condition (M)

-- Ancillary: A claim record submitted by any provider for laboratory, radiological or similar services (A)
-- Pharmaceutical: A claim record for a prescription drug claim (P)

Assign record type based upon servicing provider type and the nature of the service procedure.
- Assign provider type based on the specialty of the service provider. The "ExTypeOfProvider" worksheet of the attachment S5_CAD_DataDIctionary includes an example mapping of specialty to provider type. Based upon the specialty of the service provider on the claim record the provider type recognized by ETG is assigned. For example, using the "ExTypeOfProvider" worksheet a provider specialty code of 100 on the claim would be assigned the ETG provider type of Facility.
- Type of service is based on the service procedure code (CPT, HCPCS, Revenue, NDC). The worksheet "ProcToRecordType" in the attachment S5_CAD_DataDictionary includes the information required to assign record type based upon the procedure code on the claim record.
- Use the combination of type of provider and type of service to determine record type. The worksheet "ProcToRecordType" in the attachment S5_CAD_DataDictionary provides a mapping of provider type and type of service to record type. For example, procedure code 99025 (Initial surgical evaluation) is assigned a record type of Management (M) when the provider type is either clinician (see column "Clinician Record Type" where procedureCode=99025) or a facility (see column "Facility Record Type" where procedureCode=99025). This same procedure code would be assigned a record type of Ancillary (A) when the provider type is non-clinician (see column "Non-Clinician Record Type" where procedureCode=99025).

Examples of record type assignment include:
- An office visit record provided by an internist will be assigned a "Clinician" provider type and a record type of "Management (M)"
- A cholecystectomy provided by a general surgeon will be assigned a "Clinician" provider type and a record type of "Surgery (S)"
- A pharmacy prescription will be assigned a record type of "Pharmaceutical (P)"
- An injection for chemotherapy (e.g., HCHPS J-code) will also be assigned a record type of "Pharmaceutical (P)"
- An imaging service provided by a radiologist, orthopedic surgeon, facility or any provider will be assigned a record type of "Ancillary (A)".

The worksheet "ExRecordType" in the attachment S5_CAD_DataDictionary includes further examples.

The assigned record type provides information to the CAD episode-building methodology about the nature of the service and whether the diagnostic and other information on the service provides confirmatory information for a clinician service (versus potentially rule-out information from imaging, lab or other diagnostic services). Record type plays an important role in how services can trigger episodes of care and join and/or modify existing episodes.

Step 1B: Identify Anchor Records. The record type assigned in Step 1A is used to identify anchor records. An anchor record indicates that a clinician has evaluated the patient, assigned a diagnosis and has initiated the treatment and care of the patient for the condition. If the record type assigned to the service is M, S, or F (Management, Surgery or Facility), the service is an anchor record. All other services are considered non-anchor records.

Steps 1C through 1F: Before episodes can be built from anchor records and non-anchor services can be assigned to episodes, the relationship of diagnoses and procedures to each condition, including CAD, need to be assigned. Steps 1C through 1F describe how these relationships are defined. These initial steps categorize diagnoses and procedures relative to each condition, saving this information for use in the subsequent steps described in Step 2 and Step 3.
Note that in some instances a service may have a potential clinical relationship to more than one condition. This concept has importance to episode building, in general, and for episodes of CAD. While each service can inform grouping decisions across multiple episodes, the ETG methodology assigns each service uniquely to a single episode. Such an approach ensures that double-counting does not occur when considering service cost and utilization in the creation of resource use measures. As a result, accurate decisions on assigning a service to an episode of CAD or to another condition require the assessment of both the relationship of a service to CAD and to all other conditions for a patient. The methodology described in this section classifies diagnoses and procedures based on their relationship to CAD and also the strength of that relationship relative to other conditions. Using ETG, accurate episode grouping for CAD and other conditions must occur in the context of all of a patient's conditions.

Step 1C: Assign Diagnoses to Diagnosis Class
Assign each ICD-9 diagnosis code to a "diagnosis class". There are three diagnosis classes applied across all diagnosis

codes, including diagnosis codes eligible for CAD:
- Specific: These diagnosis codes indicate a specific disease as opposed to a sign or symptom. These codes are specific enough to be linked to a single ETG. ICD-9 diagnosis code 414.2 (chronic total occlusion of coronary artery)) is an example of a specific diagnosis code for CAD. It is primary to, and only eligible for an episode of CAD. Specific diagnosis codes are usually primary to and eligible for a single ETG.
- Non-Specific: Like specific diagnoses, these diagnosis codes represent a disease or condition, but are not specific enough to support linkage to a single condition. Unspecified cardiovascular disease (429.2) is an example of a non-specific diagnosis for CAD. Although unspecified cardiovascular disease represents disease as opposed to a sign or symptoms, it is not specific as to representing a single disease. Services with this diagnosis will be assigned to an episode based on both information related to a CAD episode as well as information related to other potential conditions.
- Signs and Symptom: These diagnosis codes represent signs and symptoms of disease as opposed to a disease or condition. For example, Chest Pain (ICD-9 diagnosis code 786.5) represents a sign and symptom rather than a disease. Chest Pain could be related to multiple diseases. ETG assigns sign and symptoms diagnoses to the lowest specificity. Services with signs and symptoms diagnosis codes may be eligible for many ETGs due to their generic nature. These services will be gathered to episodes as a later step in the grouping process, after other, more specific, information has been considered.

Diagnosis class assignments determine how a service is grouped to an episode and the order in which it is considered. The ETG methodology considers one person at a time and an individual's medical and pharmacy service records are grouped in several distinct passes. The methodology first processes the specific and non-specific diagnosis codes on anchor records so that concrete conditions/diseases are created. It then processes services with sign and symptom diagnosis codes in reverse chronological order (based on dates of service) to determine the best episode these services can group to.

Step 1D: Identify the Clinical Relationship Between Diagnosis Codes and Conditions, Including CAD
Match each diagnosis code with one or more conditions (ETGs) through a diagnosis eligibility table. In addition to mapping diagnosis codes to conditions, each diagnosis code is further ranked, based on its strength of association with a condition. A rank of "primary" or "incidental" is assigned to each diagnosis and condition combination, with a further ranking assigned to incidental relationships:
- Primary: A "primary" diagnosis/condition relationship is assigned where the diagnosis defines that condition. The diagnosis codes that are classified as primary to CAD are listed on the "PrimaryDxCodes" worksheet within the attachment "S5_CAD_DataDictionary" (Note: the word "primary" here is used to describe the relationship between a diagnosis and an episode, it is not used to indicate the position of the diagnosis code on the claim line. The diagnosis in any position on the claim line can have a primary relationship with CAD). This map is used to identify primary diagnoses for CAD. Examples of diagnoses ranked as primary for CAD are 414.2 (Chronic total occlusion of coronary artery), 414.0 (Coronary atherosclerosis) and 414.3 (Coronary atherosclerosis due to lipid rich plaque). Primary diagnosis codes can only be ranked as primary for a single ETG condition.
- Incidental: These diagnosis codes are eligible for a condition but are not classified as primary. These diagnosis codes can be incidental to other conditions. To support the linkage of these diagnosis codes to a final episode, a further ranking is assigned for each condition based on the relative strength of association between the diagnosis and condition. Values of low, medium, or high are assigned for each diagnosis/condition. The Diagnosis codes that are incidental to CAD are listed on the "IncidentalDxCodes" worksheet within the attachment "S5_CAD_DataDictionary". The column "diagnosisEligibilityType" in the worksheet describes the relative strength ranking where 3 represents a high association, 2 represents a medium association and 1 represents a low association.

Step 1E: Identify Relationships between Procedure Codes and Conditions, Including CAD
Match each procedure code with one or more conditions, including CAD, through a procedure eligibility table. All procedure codes that are eligible for CAD are listed on the "ProcedureCodes" worksheet within attachment "S5_CAD_DataDictionary". In the same way diagnoses can relate multiple conditions, a procedure can relate to more than one episode. The ProcedureCodes worksheet also includes a ranking of the strength of the clinical relationship of each CPT and HCPCS code with CAD, ranked from 1 to 4 based on the relative strength of the clinical relationship between the procedure and CAD. This relationship is included in the "ProcedureRank" column in the worksheet. A rank of 4 represents the strongest association and a rank of 1 the lowest. In this way, ETG considers not only the diagnostic information on a service when making grouping decisions around CAD, but also the service procedure and the strength of the relationship between the procedure and CAD relative to other potential conditions.

Step 1F: Identify Relationships Between Pharmacy Services and Conditions, Including CAD
The relationship between pharmacy services and CAD and other conditions is based on the pharmacy code assigned to the service. To support this assessment, the ETG methodology assigns each pharmacy service to a Drug Category Code (DCC). The DCC describes the drug's active ingredients and route of administration. DCCs are then mapped to ETGs

and define the relationships between a drug and a condition. Most pharmacy services are defined using NDC procedure codes, however selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC by ETG (e.g., J-codes describing injections).
The "Pharmacy" worksheet in the attachment "S5_CAD_DataDictionary" describes the DCCs assigned to CAD. Similar to diagnoses and procedures, there are some instances a DCC code may be eligible for more than one ETG. In these cases, the ETG methodology uses strength of the clinical relationship between the DCC code and the episode condition. The "Rank" in the worksheet describes this strength of association for each DCC and CAD. The lower the value is for Rank, the stronger the association between the DCC and the episode. If multiple episodes are competing for a pharmacy service, this rank is used to support decisions on assignment.

Given the clinical relationships described in Steps 1A through 1F, the following steps are used to build episodes from anchor records.
Step 2- Build Episodes from Anchor Records.
Building CAD episodes from anchor records is a multi-step process that utilizes diagnostic and procedural information and the clinical relationships defined in Step 1. Anchor records are grouped in two passes through the patient's data. The first pass groups the anchor records with specific and non-specific diagnoses. The second pass groups anchor records with sign and symptoms diagnoses. All anchor records are grouped before all non-anchor records.

Step 2A: Use Anchor Records to Start an Episode of CAD Using Specific and Non-Specific Diagnoses
A service must be an anchor record to start an episode of CAD. The service must also have a procedure code that is eligible for CAD and an ICD-9 diagnosis code that is primary for CAD. See worksheets "PrimaryDxCodes" and "ProcedureCodes" within attachment S5_CAD_DataDictionary for a complete list of diagnosis codes and procedure codes that are primary for CAD. All codes within the "PrimaryDxCodes" worksheet are considered primary to CAD. If an anchor record meeting these requirements is observed, start an episode for CAD.
As an example of an anchor record that starts an episode of CAD, a cardiologist sees a patient and submits a claim record using the CPT procedure code 99212 (Office visit, established patient) with and ICD-9 diagnosis code 414.2 (Chronic total occlusion of coronary artery).
Note that a single anchor record can start more than one episode. For example, an anchor record with a diagnosis and procedure code combination that is eligible for CAD will start a CAD episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it will also start a Hypertension episode. (See Section I of the Attachment for S2 above for a discussion of the concept of "phantom episode clusters".)

Step 2B: Group Anchor Records to an Episode of CAD Using Specific and Non-Specific Diagnoses
Once an episode of CAD is started, group further anchor records to that episode. Consider specific and non-specific diagnoses on anchor records first.
First identify whether the anchor record is eligible for CAD. Eligible anchor records for CAD have a procedure code eligible for CAD and a diagnosis code that has either a primary or incidental relationship to CAD. See the "ProcedureCodes" worksheet within S5_CAD_DataDictionary for the procedure codes eligible for CAD. See the "PrimaryDxCodes" and "IncidentalDxCodes" worksheets within S5_CAD_DataDictionary for a list of the diagnosis codes primary and incidental to CAD.
For anchor records with eligibility to a CAD episode, apply the following steps to assign the anchor record to an episode.
Step 2B1 - If the anchor record is only eligible for the open CAD episode, group the anchor record to the CAD episode.
In some cases, an anchor record can be eligible to join more than one episode. This is true because a service may have more than one diagnosis code. Further, diagnosis codes that are incidental for CAD may also be eligible for another ETG condition.
Step 2B2 - If the anchor record is eligible for the CAD episode and another episode for the patient, apply the following tie-breaking steps to determine the episode an anchor record groups to:
-Assess the specificity of the diagnoses on the anchor record. Diagnosis class describes this specificity and was assigned to each diagnosis code in Step 1C (specific or non-specific).
-Assign the anchor record to an episode based on the diagnosis class. Episodes related to specific diagnoses take precedence over episodes related to non-specific diagnoses.
Specific diagnoses:
-If a diagnosis on the anchor record is specific and has a relationship with a single episode, assign the anchor record to that episode.
-If the anchor record has more than one specific diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the anchor record to determine the episode that the anchor groups to.

-If the strength of relationship between the procedure code and the different episode conditions is the same for the specific diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. Primary relationships between diagnosis codes and episode conditions have precedence over incidental relationships.
-If the strength of the relationship between the specific diagnosis codes and the episode conditions is the same, the time between the anchor record and the closest anchor for the open episode is used.
Non-specific diagnoses:
-If no specific diagnoses are observed on the anchor record, consider non-specific diagnoses in assigning the anchor record to an episode. Apply the same order of logic described directly above for specific diagnoses to the assignment of anchor records based on non-specific diagnoses.
At the completion of Step 2B, each anchor record with a specific or non-specific diagnosis has been assigned to an episode, including episodes of CAD.
Note that in the same way a single anchor record can start more than one episode (Step 2A), a single anchor record can also extend more than one episode, however the anchor record itself can only be assigned to one episode, as described above. For example, an anchor record with a diagnosis and procedure code combination that is eligible for CAD can extend a CAD episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it can also extend a Hypertension episode. (See Section I of the Attachment for S2 above for a discussion of the concept of "phantom episode clusters" and the concept of extending episodes.)

Step 2C: Group Anchor Records to an Episode of CAD Using Sign and Symptom Diagnoses
The last step in grouping Anchor records to CAD and other episodes involves processing anchor records with only sign and symptom diagnosis codes. All sign and symptom diagnosis codes for CAD are listed within the S5_CAD_DataDictionary on worksheet "IncidentalDxCodes" where column "specificity"="Sign and Symptom". An example is Chest Pain (ICD-9 786.5).
For these anchor records with eligibility to a CAD episode, apply the following steps to assign the anchor record to an episode.
Step 2C1 - If the anchor record is only eligible for the open CAD episode, group the anchor record to the CAD episode.
Step 2C2 - If the anchor record is eligible for the CAD episode and another episode for the patient, apply the following tie-breaking steps to determine the episode an anchor record groups to:
-If the anchor record has more than one sign and symptom diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the anchor record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the sign and symptom diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. For sign and symptom diagnoses, incidental relationships between diagnosis codes and episode conditions have precedence over primary relationships.
-If the strength of the relationship between the sign and symptom diagnosis codes and the episode conditions is the same, the time between the anchor record and the closest anchor for the open episode is used.
At the completion of Step 2C, each anchor record with a sign and symptom diagnosis has been assigned to an episode, including episodes of CAD.
After completing these steps, anchor records have been used to open episodes of CAD, as well as episodes for other conditions. Anchor records have been assigned uniquely to individual episodes based on the clinical logic described above and in the attachment "S5_CAD_DataDictionary".

Step 3. Group Non-Anchor Records to Episodes.
Non-anchor records (record type "Ancillary" and "Pharmacy") can not open episodes on their own, but can join episodes. For example, a service for a routine ECG with at least 12 leads; with interpretation and report (CPT code 93000), with a diagnosis of 414.2 (Chronic total occlusion of coronary artery) can group to an open episode of CAD but can not open the episode itself.
Step 3A: Group Non-Anchor Records other than Pharmacy to an Episode of CAD Using Specific and Non-Specific Diagnoses
Once an episode of CAD is started and anchor records have been grouped, non-anchor records can group to that episode. Consider specific and non-specific diagnoses on non-anchor records first.
First identify whether the non-anchor record is eligible for CAD. Eligible non-anchor records for CAD have a procedure code eligible for CAD and a diagnosis code that has either a primary or incidental relationship to CAD. See the "ProcedureCodes" worksheet within S5_CAD_DataDictionary for the procedure codes eligible for CAD. See the

"Pharmacy" worksheet within S5_CAD_DataDictionary for the pharmacy codes eligible for CAD. See the "PrimaryDxCodes" and "IncidentalDxCodes" worksheets within S5_CAD_DataDictionary for a list of the diagnosis codes primary and incidental to CAD.
For non-anchor records with eligibility to a CAD episode, apply the following steps to assign the record to an episode.
Step 3A1 - If the non-anchor record is only eligible for the open CAD episode, group the record to the CAD episode.
In some cases, a non-anchor record can be eligible to join more than one episode. This is true because a service may have more than one diagnosis code. Further, diagnosis codes that are incidental for CAD may also be eligible for another ETG condition.
Step 3A2 - If the non-anchor record is eligible for the CAD episode and another episode for the patient, apply the following tie-breaking steps to determine the episode the record groups to:
-Assess the specificity of the diagnoses on the non-anchor record. Diagnosis class describes this specificity and was assigned to each diagnosis code in Step 1C (specific or non-specific).
-Assign the non-anchor record to an episode based on the diagnosis class. Episodes related to specific diagnoses take precedence over episodes related to non-specific diagnoses.
Specific diagnoses:
-If a diagnosis on the non-anchor record is specific and has a relationship with a single episode, assign the record to that episode.
-If the non-anchor record has more than one specific diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the specific diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the non-anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. Primary relationships between diagnosis codes and episode conditions have precedence over incidental relationships.
-If the strength of the relationship between the specific diagnosis codes and the episode conditions is the same, the time between the non-anchor record and the closest anchor for the open episode is used.
Non-specific diagnoses:
-If no specific diagnoses are observed on the non-anchor record, consider non-specific diagnoses in assigning the record to an episode. Apply the same order of logic described directly above for specific diagnoses to the assignment of non-anchor records based on non-specific diagnoses.
At the completion of Step 3A, each non-anchor record with a specific or non-specific diagnosis has been assigned to an episode, including episodes of CAD.

Step 3B: Group Non-Anchor Records other than Pharmacy to an Episode of CAD Using Sign and Symptom Diagnoses
The last step in grouping non-anchor records to CAD and other episodes involves processing non-anchor records with only sign and symptom diagnosis codes. All sign and symptom diagnosis codes for CAD are listed within the S5_CAD_DataDictionary on worksheet "IncidentalDxCodes" where column "specificity"="Sign and Symptom". An example is Chest Pain (ICD-9 786.5).
For these non-anchor records with eligibility to a CAD episode, apply the following steps to assign the record to an episode.
Step 3B1 -If the non-anchor record is only eligible for the open CAD episode, group the record to the CAD episode.
Step 3B2 - If the anchor record is eligible for the CAD episode and another episode for the patient, apply the following tie-breaking steps to determine the episode the record groups to:
-If the non-anchor record has more than one sign and symptom diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the record to determine the episode that the record groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the sign and symptom diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the non-anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. For sign and symptom diagnoses, incidental relationships between diagnosis codes and episode conditions have precedence over primary relationships.
-If the strength of the relationship between the sign and symptom diagnosis codes and the episode conditions is the same, the time between the non-anchor record and the closest anchor for the open episode is used.

Step 3C: Group Pharmacy Records to an Episode of CAD
Pharmacy services group differently than other non-anchor records because they usually do not have ICD-9 diagnosis codes associated with them to use in grouping. Instead, pharmacy records are assigned to CAD and other episodes using

a table that maps NDC to a DCC code (Drug Category Code) based on the drug's active ingredients and route of administration. A DCC to ETG map is then used to inform the grouping for the service. The relationship between DCC codes and CAD are described in the "Pharmacy" worksheet in the attachment "S5_CAD_DataDictionary".
In some instances a DCC code may be eligible for CAD and another open episode for a patient. In these cases, where multiple episodes are observed for a patient where the DCC code has eligibility, use the strength of the clinical relationship between the DCC code and the episode to determine final assignment. The column "Rank" in the "Pharmacy" worksheet within attachment "S5_CAD_DataDictionary" describes that strength of association. The lower the value is for Rank, the stronger the association between the DCC and the episode.

Due to the size of the attachment the full list of NDC to DCC mappings has not been provided within this submission. This file is available upon request. The DCC mappings included in the S5 attachment provide a summary of the key clinical relationships between drugs and the conditions described by the relevant ETGs The NDC to DCC map would include the individual NDCs within a DCC that map to those relationships.

At the completion of Step 3C, all relevant records for CAD episodes have been assigned.

Step 4: Finalize the Episodes

Finalizing an episode of CAD involves determining whether or not the episode is complete, assigning co-morbidities and condition status factors and calculating a severity score and associated severity level. Co-morbidities and condition status factors will be discussed in section 8.3 and severity score calculation and level assignment is addressed in section 8.5.
In terms of episode completeness, CAD is a life-long, chronic condition. Therefore the general clean period logic described in the attachment for question S2 above is not applicable. All clinically consistent treatments for the care of a CAD patient will group to the episode of CAD for as long as data are available. (For the convenience of analytics and measurement, it is customary to segment chronic episodes, including CAD, into year long episode units.)

S8.3. Comorbid and interactions
Detail the treatment of co-morbidities & disease interactions and provide rationale for this methodology.

Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_CAD. This attachment provides an overview of ETGs and a summary of the methodology used for CAD episodes.
- S8_CAD_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CAD methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

Co-morbidities and condition status factors are identified for each CAD episode. These factors provide specificity of the episode's clinical condition and also play a key role in assigning a severity score and level to the episode.

Steps to Assign Co-morbidities and Condition Status Factors to CAD Episodes:

Step 1 – Condition Status Factors for CAD Episodes.

Each CAD episode is evaluated to determine whether any Condition Status Factors for CAD are observed, To do this, the anchor records for the episode are evaluated using a comparison of their ICD-9 diagnoses with the diagnoses for the conditions status factors for CAD. The condition status factors used for CAD and the matching diagnoses for each are included in the "ConditionStatustoDxCodeMap" Worksheet in the attachment "S8_CAD_ClinicalLogic".

The following condition status factors are defined for CAD:
-Acute Myocardial Infarction
-Subendocardial Infarction

If these Condition Status Factor diagnosis codes are present on the anchor records for a CAD episode, that condition

status factor is recorded for the episode.

Step 2 –Comorbidity Factors for CAD Episodes.

Each CAD episode is evaluated to determine whether any Comorbidity Factors for CAD are observed, To do this, the anchor records outside the CAD episode are evaluated using a comparison of their ICD-9 diagnoses with the diagnoses for the comorbidity factors for CAD. The comorbidity used for CAD and the matching diagnoses for each are included in the "ComorbtoDxCodeMap" Worksheet in the attachment "S8_CAD_ClinicalLogic".

Examples of the comorbidity groups for CAD include Diabetes, Chronic Heart Failure and Chronic Bronchitis. In the example included in the S8_CAD_ClinicalLogic attachment (see worksheet "ExSevScore&Level"), the co-morbidities 80174 (congestive heart failure) and 80290 (other pulmonary disorders) are assigned to the CAD episode based upon the diagnosis information on anchor records that occur outside of the CAD episode.
Interactions between two co-morbidities or two condition status factors are also identified for CAD. These interactions are used in assigning severity to a CAD episode and are described in section 8.5.

S8.4. Clinical hierarchies
Detail the hierarchy for codes or condition groups used and provide rationale for this methodology.

As noted in S8.2 and S8.3, ETG uses different clinical relationships between diagnosis and procedure codes and conditions to support the creation of CAD episodes. Many of these relationships involve clinical hierarchies, including how specific and non-specific and signs and symptoms diagnosis codes are used. The relationship between primary and incidental diagnoses and the strength of association of incidental diagnoses to CAD and other episode concepts is a further example. A third example is the procedure hierarchies that apply across all concepts for CAD. Please see the discussion for sections S8.2 and S8.3 and the attachment for S2 for a summary of the role of rankings, strength of association and hierarchies are used in the ETG methodology for CAD. Further, as described below in the discussion of severity adjustment, ETG also uses hierarchies to identify the most important co-morbidities within a related set of co-morbidities for use in measuring severity.

S8.5. Clinical severity levels
Detail the method used for assigning severity level and provide rationale for this methodology.

Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_CAD. This attachment provides an overview of ETGs and a summary of the methodology used for CAD episodes.
- S8_CAD_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CAD methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

More specifically, apply the following steps:

Step 1 – Identify Condition Status Factors and Comorbidities in an Episode

Assignment of severity occurs after the identification of condition status factors and comorbidities as detailed in specification S8.3. Interactions between various co-morbidities also play a role in severity assignment as well as demographic factors. The combination of all of these factors are used to describe a "severity" score and level for an episode, where a higher level of severity indicates an expectation of a higher level of resources required to diagnose, manage and treat an episode of CAD.

The steps required to identify condition status and comorbidity factors for CAD are described in S8.3.

Step 2 – Map Episode Comorbidities to the Final Comorbidities used to Calculate Episode Severity

The individual comorbidities identified in S8.3 are further grouped to the final comorbidity factors used in calculating episode severity. This step is performed to combine the effects of related comorbidities on severity. Further, in some cases, hierarchies are used to limit final factors to those comorbidities within a related group that have the greatest impact on episode severity. For example, for CAD, Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, Chronic bronchitis, and Asthma are are all qualified as comorbidities and are all conditions categorized as Bronchial Inflammation. Given the related nature of these comorbidities, only one factor is used as the final comorbidity factor for computing severity. Steps 2.1 through 2.4 describe how this final comorbidity is selected.

Worksheet "Comorbidities" – includes the ComorbidityCodes and Comorbidity Groups used to determine severity for CAD. Co-MorbidityGroup2 is the final comorbidity factor used to compute episode severity. To determine this factor:

Step 2.1 – Assign ComorbidtyGroup1 and ComorbidityGroup2 to each ComorbidityCode. Using Bronchial Inflammation as an example, Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, Chronic bronchitis, and Asthma would all be assigned to Bronchial Inflammation for ComorbidityGroup1. Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, and Chronic bronchitis would be assigned to "Bronchial Inflammation 2" for ComorbidityGroup2 and Asthma would be assigned to "Bronchial Inflammation 1" for ComorbidityGroup2.
Step 2.2 – Assign Priority to each ComborbidtyCode Other inflammatory lung diseases, Occupational & environmental pulmonary diseases, Chronic bronchitis, and Asthma would be assigned a Priority value of 1, 2, 3, and 4, respectively.
Step 2.3 – Across all of the values for ComorbidityCode within each ComorbidityGroup1, select the ComorbidityCode with the lowest value for Priority. As an example, if Chronic bronchitis and Asthma were both observed, Chronic Bronchitis would be selected due to its lower value for Priority (a Priority value of 3 take precedence over a Priority value of 4)

The remaining values for ComorbidityCode and ComorbidityGroup2 define the final comorbidity factors used in determining CAD severity. In the above example (where Chronic bronchitis and Asthma were both observed), Bronchial Inflammation 2 (Chronic Bronchitis) would be selected as the final comrobidity within Bronchial Inflammation.

Step 2.4 – Assign a risk weight to each remaining factor. Each risk weight reflects the incremental contribution of having a specific comorbidity factor on CAD severity. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight. For Bronchial Inflammation 2, a risk weight of 0.1811 would be assigned for a non-elderly patient. A risk weight of 0.0 would be assigned for an elderly patient .

Step 3 – Identify Comorbidity Interactions

The interaction between two observed comorbidities can contribute to episode severity. Worksheet "ComorbidityInteractions" includes the interactions between Comorbidity Groups used to determine severity for CAD. The table describes pairings of the final comorbidity factors produced by Step 2 (identified by the values for ComorbidityGroup2).

Step 3.1 – Identify pairings of ComorbidtyGroup2 for the episode that are also observed in the Worksheet "ComorbidityInteractions"
Step 3.1 – Assign a risk weight to each qualified interaction. Each risk weight reflects the incremental contribution of having a specific comorbidity interaction on CAD severity. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight.

Step 4 – Identify Comorbidity Counts

For some ETG conditions the number of final comorbidity factors will impact episode severity – for example, where 3 or more co-morbidity factors are observed. For these episodes, a separate Worksheet "ComorbidityCounts" includes these additional severity factors and their assigned risk weights added for those episodes. CAD does not include any Comorbidity Count factors; this step does not apply to CAD.

Step 5 – Condition Status Factors

The Worksheet "ConditionStatuses" – includes the Condition Status factors used to determine severity for CAD. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status factor on CAD severity.

For each condition status factor observed, assign a risk weight. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight.

Step 6 – Identify Condition Status Interactions

For some ETG conditions, the interaction between two observed condition status factors can contribute to episode severity. A separate tab, Worksheet "ConditionStatusInteractions" would be used to identify qualified pairings and their weight in calculating severity. CAD episodes do not use condition status interactions in calculating severity. Step 6 does not apply to CAD.

Step 7 – Identify Condition Status Counts

For some ETG conditions the number of final condition status factors will impact episode severity – for example, where 3 or more condition status factors are observed. For these episodes, a separate Worksheet "ConditionStatusCounts" includes these additional severity factors and their assigned risk weights added for those episodes. CAD does not include any condition status count factors; this step does not apply to CAD.

Step 8 – Assign Demographic Factors

The Worksheet "Demographics" includes the additional severity factors added based on age and gender. Each risk weight reflects the incremental contribution of having a specific Demographic factor on CAD severity. Based on patient age, assign the patient to an age range group. Using gender and age group, assign a demographic factor weight. Use patient age as of the ending date for the measurement period to determine the appropriate age range group.

Step 9 – Compute Severity Score

Sum the risk weights assigned for each of the relevant factors identified above. The sum of these weights is the overall severity score for the episode. As noted above, the higher the severity score for an episode, the more resources are expected relative to other CAD episodes.

As a note, the estimation of the risk weights used in computing severity for CAD episodes is based on empirical analyses of healthcare data for a benchmark population of over 25 million individuals. In particular, multivariate regression analyses were used where cost per episode for individual CAD episodes was the dependent variable and the defined array of co-morbidity and condition status factors and patient age and gender were the independent variables. The model was run separately for individuals 65 and over and those under 65 years of age. The resulting estimated parameters were used to assign weights to each factor described in the above tables. These weights and the presence of a particular set of factors for an episode are used to determine a CAD severity score for the episode.

Step 10 – Compute Severity Level

Based on the severity score, the severity "level" indicates a categorical ranking of where the specific episode is relative to the population of all CAD episodes. There are four potential severity levels for CAD, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. The "Thresholds" Worksheet in attachment "S8_CAD_ClinicalLogic" describe the three cut-off points that define the four levels of severity for CAD episodes.

Assign severity level to the episode depending on the episode severity score calculated in Steps 1-9 and where that score falls within the ranges defined in the "Threshold" Worksheet.

Example: Assigning Severity Score and Level to CAD Episodes

The example included within the S8_CAD_ClinicalLogic attachment (see worksheet "ExSevScore&Level") shows the

calculation of severity score and level for a CAD episode. It describes a Male patient, age 47, observed to have a number of anchor records with a diagnosis that maps to the CAD ETG. The patient is also observed to have one condition status factor and two co-morbidities that are also eligible for CAD. The condition status factor 70083 (acute myocardial infarction) was identified through one or more anchor records observed within the episode where the diagnosis on the records mapped to that condition status factor. The co-morbidities (80174 congestive heart failure and 80290 other pulmonary disorders) both were identified on one or more anchor records observed outside of the CAD episode.

Assign severity markers and weights: The patient receives a severity marker for each of the condition status and co-morbidity factors and a risk weight is assigned to each. The patient also receives severity weight related to his age and gender which fall into the "Male 45-54" range. Finally, the patient receives additional severity weight due to an interaction term included in the severity model for CAD.

Calculate severity score: A severity score of 5.1828 is calculated based upon the sum of:
-The Demographic weight of 0.6377 (see worksheet "Demographics" within S8_CAD_ClinicalLogic where column "gender"=M and column "ageRange"=45-54);
-The condition status weight for acute myocardial infarction of 2.7223 (see worksheet "ConditionStatuses" within S8_CAD_ClinicalLogic where column "conditionStatusCode"=70083),
-The co-morbidity weight for Congestive Heart Failure of 0.5666 (see worksheet "Comorbidities" within S8_CAD_ClinicalLogic where column "comorbiditycode"=80174. The CAD co-morbidity belongs to the Comorbiditygroup2 of Heart Disease 2.);
-The comorbidity weight for Other Pulmonary Disorders of 0.8383 (see worksheet "Comorbidities" within S8_CAD_ClinicalLogic where column "comorbiditycode"=80290. Other Pulmonary Disorders belongs to the co-morbidity group of Serious Pulmonary Disease 1.).
-The interaction weight of 0.4179 for the interaction of the Congestive Heart Failure and Other Pulmonary Disorders co-morbidity groups. (Using the worksheet "ComorbidityInteractions" within S8_CAD_ClinicalLogic the interaction of these two co-morbidity groups results in an adjustment of the severity score by 0.4179 (where column "FirstComorbidityGroup2"=Heart Disease 2 "SecondComorbidityGroup2"=Other Pulmonary Disorders).

The final severity score, including the co-morbidity interaction adjustment is calculated as 0.6377 + 2.7223 + 0.5666 + 0.8383 + 0.4179 = 5.1828

Calculate severity level: The severity score of 5.1828 falls with the range of > 3.4 and the episode is assigned to Severity Level 4.

S8.6. Concurrency of clinical events (that may lead to a distinct measure)
Detail the method used for identifying concurrent clinical events, how to manage them, and provide the rationale for this methodology.

ETG does provide methodology to deal with cases where a code will shift an episode from one ETG to another. For example, a concurrent renal transplant procedure will shift an episode of ETG Chronic renal failure to an episode of ETG Kidney transplant. There are no codes that will cause an episode of CAD to shift to another ETG.

As described in detail in S8.2, in the case where a diagnosis and procedure code on a claim are eligible for multiple episodes, a specific hierarchy of rules determines the most appropriate episode to group to, based on the rankings of the diagnosis and procedure code for the ETG of each episode. All of the eligibility and ranking information for CAD is described in the attachment for S5.)

For more information about episode building construction/logic, please refer to the attachment for S.2 .

S9. Measure Construction Logic (Resource Use Measure Module 3)
The measure's construction logic includes steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic. For example, any temporal or spatial (i.e., setting of care) parameters used to determine if a particular diagnosis or event qualifies for the measure of interest.

Construction Logic Supplemental Attachment or URL:
If needed, attach supplemental documentation (Save file as: S9_Construction Logic). All fields of the submission form that are supplemented within the attachment must include a summary of

important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.)

URL:
Please supply the username and password:
Attachment:

S9.1. Brief Description of Construction Logic
Briefly describe the measure's construction logic.

Please refer to information provided in S2 and S8 for construction logic

S9.2. Construction Logic
Detail logic steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic.

Please refer to information provided in S2 and S8 for construction logic

S9.3. Measure Trigger and End mechanisms
Detail the measure's trigger and end mechanisms and provide rationale for this methodology.

As described in detail in S8, an episode is triggered by an anchor record. This is a claim record with a procedure indicating a face to face physician encounter, a surgical procedure by a physician or a facility charge indicating a confinement. The rationale for this is that the diagnosis and procedure codes on these record types are most likely to specify a valid clinical condition related to the individual. The length of the episode will depend on the subsequent records that occur within the ETGs clean period. When there is an interval longer than the clean period of the episode without any records eligible to group to the episode, it is considered complete.

CAD is one of a number of ETGs designated as chronic. Once an episode of CAD is triggered, a yearlong episode is created. The start and end dates are configurable by the user. Chronic ETGs specify chronic conditions that are usually life long.
For more information about episode building construction/logic, please refer to S8 and the attachment we provided in s.2 .

S9.4.Measure redundancy or overlap
Detail how redundancy and overlap of measures can be addressed and provide rationale for this methodology.

The ETG application is able to keep related conditions separate. For example, suppose that there are concurrent episodes of CAD and Diabetes and there is record eligible for both ETGs. A specific hierarchy of rules coupled with a set of eligibility tables with strengths of association of each diagnosis and procedure code for each ETG will uniquely determine which episode the record will group to. There are no ambiguous assignments and episode assignment of each claim record will be unique. For more information about episode building construction/logic, please refer to S8 and the attachment we provided in s.2 .

S9.5.Complementary services
Detail how complementary services have been linked to the measure and provide rationale for this methodology.

ETG does not group based on complimentary services. All claims group to the appropriate episode on their own merits.)
For more information about episode building construction/logic, please refer to the attachment we provided in s.2 .

S9.6.Resource Use Service Categories

Inpatient services: Inpatient facility services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department

Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

S9.7.Identification of Resource Use Service Categories
For each of the resource use service categories selected above, provide the rationale for their selection and detail the method or algorithms to identify resource units, including codes, logic and definitions.

The following resource-use categories are included as measures for this submission.

Cost of Care per Episode
1. Total
2. Primary Care Core Services, Total
3. Primary Care Core Services, Visits
4. Primary Care Core Services, Other (Non-Visits)
5. ER Services
6. Hospital Services, Total
7. Inpatient Acute
8. Inpatient Non-Acute
9. Other Outpatient
10. Laboratory Services
11. Radiology Services, Diagnostic, Total
12. Radiology, MRI, CT Scan Services
13. Radiology, Other Diagnostic Services
14. Specialty Care Services, Total
15. Specialty Care, Other Diagnostic Testing Services
16. Specialty Care, Evaluation & Management Services
17. Specialty Care, Medicine Services
18. Specialty Care, Surgery Services
19. Specialty Care, Other Services
20. Pharmacy Prescription Services

Utilization per 1,000 Episodes
1. PCP Visits
2. Specialist Visits
3. Specialist Referrals
4. Total Evaluation & Management Visits
5. ER Visits
6. Hospital Inpatient Admits, Acute
7. Hospital Inpatient Days, Acute
8. Laboratory Services
9. Radiology Services, Diagnostic, Total
10. Radiology Services, MRI/CT Scan Services
11. Radiology Services, Other Diagnostic Services
12. Pharmacy Prescriptions Services

Each resource use category measure is described below, including reference to the specific codes and logic used to identify the services involved.

I. General Methods

The following notes on General Methods apply to all resource measures described here and provide guidelines on

service costs, the treatment of incomplete and outlier episodes, and the selection of time periods. The logic described for type of service plays a specific role in each measure. These general methods are employed across all submitted measures:

-- Service cost – as a guideline, the service cost used in resource use measurement should reflect the actual payments or costs associated with the service or a standard-priced resource cost amount. As a further guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example.

-- Complete episodes – Only complete episodes should be included in resource measurement. See the attachment for s.2 for a discussion of how ETG assigns completion status to an episode.

-- Outlier episodes – as a guideline, low outlier cost episodes should be excluded from resource use measurement. High outlier cost episodes should be included, but all costs truncated at the high outlier cost threshold used for the episode (a technique called "winsorization"). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier episode.

-- Episode Time periods – as a guideline, the episodes included in resource use measure should focus on a specific 12 month period, for example, all episodes ending in calendar year 2010.

-- Selecting Clinical Episodes – For CAD, select all remaining episodes with a CAD Base ETG

-- Type of Service. The type of service logic for each measure is described in the sections below. Each type of service definition includes an overview of the key steps used in identifying the relevant services used in measuring cost and utilization. As an initial step, prescription pharmacy services and hospital inpatient confinements are identified (more detail below). For the remaining services:

a. Providers are categorized into facility, anesthesiology specialties and other professional (not anesthesiology);
b. The attached document S9.5_RU_Categories then describes two levels of specifications used in assigning services to a type of service category;
c. The first table in the attachment IMAP_TOS_PROC includes one row per procedure code (CPT, HCPCS, Revenue). For each row, the table includes the procedure code, a short description and the columns PROFTOS, ANESTOS, OPTOS, and PCC_TYPE. PROFTOS, ANESTOS, OPTOS include standard TOS_I codes that are assigned to each procedure code based on whether the provider is a facility, anesthesiologist or other professional, using OPTOS, ANESTOS and PROFTOS, respectively;
d. Some services are also assigned a value for PCC_TYPE (described below);
e. The second table, IMAP_TOS, includes one row for each of the standard TOS codes included in PROFTOS, ANESTOS and PROFTOS and columns for the TOS_I codes, ENC_TOS, and ENC_TOP and a brief description of the TOS_I. ENC_TOS and ENC_TOP are used in defining encounters below.
f. These two tables are used in creating the measures described below.

-- Encounters. An Encounter is contact between an individual and the health care system for a related set of services. It is based on the type of service and the type of provider for a member on a specific day. Providing the ability to view data by encounters helps convey the scope and influence of all services associated with patient-health care system meetings. The concept of an encounter is used for the utilization measures described below. The following steps are used to assign an encounter value to each service record:

a. Hospital inpatient admissions. A hospital inpatient confinement is considered a single encounter (ENCOUNTER=1).
b. Prescription pharmacy. A pharmacy service record (claim record) is considered a single encounter (ENCOUNTER=1).
c. Ancillary Drug Administered Services. All Ancillary, Drugs Administered (TOS_I values 201 thru 211), are considered an encounter (ENCOUNTER=1).
d. For all other services, the number of encounters is dependent on the Type of Service and the Type of Provider assigned to the claims. In particular, the values included in the table IMAP_TOS for Encounter Type of Service (ENC_TOS) and Encounter Type of Provider (ENC_TOP) are used. As shown in IMAP_TOS, both the Encounter TOS and Encounter TOP are based on Type of Service (TOS_I) and can be assigned using table IMAP_TOS, and joining on TOS_I from the service record.
e. For these other services, medical service records are sorted by Member, Date of Service, ENC_TOS and ENC_TOP.
f. The calculation of encounters for services other than emergency room, laboratory and radiology services is 1

divided by the total number of records in the combination of Member, Date of Service, Encounter TOS, and Encounter TOP.
g. Additional logic. Emergency room, laboratory and radiology services need to have a different logic because these services often are billed using both a technical and professional component – where both a professional provider and facility provider are involved.
h. Any service with the following Encounter TOS values will use the additional logic when calculating encounters.
1. ER professional and facility services (ENC_TOS=24)
2. Lab and pathology professional and facility services (ENC_TOS=29, 31)
3. Diagnostic and therapeutic radiology professional and facility services (ENC_TOS=47, 49)
i. For the services using the additional logic, for each Member, Date of Service, and ENC_TOS distinct combination, sum the number of records for each of the Encounter TOP values of 1 and 2.
1. Two cases can exist for these services: there are both facility and professional records in the combination; or there are only facility records or only professional records.
2. Where at least one facility record and one professional record, the encounter is divided up equally between the professional and technical components. Therefore, the calculations for Encounters for these situations are: 0.5 divided by {number of records with Encounter TOP = 1 (Facility)} and 0.5 divided by {number of records with Encounter TOP = 2 (Professional)}
3. Where all records have the same ENC_TOP value, the encounters calculation will be the generic calculation: 1 divided by {number of records in the combination of Member, Date of Service, Encounter TOS, Encounter TOP}
-- Cost and Utilization Measures. The actual resource use for an episode is the sum of the costs or encounters for those services grouped to the episode. Measures of actual cost or use per episode across episodes, is the sum of cost or use divided by the total number of episodes included in the measurement.

II. Cost of Care per Episode

Total Service Costs. Total services costs include the total costs for all services included in the selected clinical episodes.

Primary Care Core Services Costs. Primary Care Core (PCC) services include a select group of services traditionally performed by an individual's primary care physician. The PCC concept is similar to the idea of the group of services typically included in a primary care capitation definition. In particular, these services include non-inpatient evaluation and management services and selected imaging, diagnostic and minor procedure services. PCC Services are identified as follows:
-- First select services rendered by a primary care provider. The identification of primary care providers can be made configurable. At a minimum, these providers include the individual's assigned PCP. Further, to include covering providers, other primary care providers in the network are included, defined using either a list of provider ids or all physicians with a specialty of internal medicine, family practice, geriatric medicine, adolescent medicine and pediatrics, or both (e.g., using a list to include specific OB/GYN providers in addition to all providers with primary care specialties).

i. The CPT procedure code on the selected services is then used to identify:
1. PCC Services Total
2. PCC Services, Visits and
3. PCC Services Other.
ii. The CPT procedure codes assigned to these categories are included in the column PCC_TYPE in the attachment table IMAP_TOS_PROC. Values of "Visit" and "Other" are used. Blank entries for a procedure code indicate that they are not included as a PCC service.

-- ER Service Costs. These services include professional and facility emergency room services.
i. Professional ER Services are identified as having values of 1803 thru 1805 in IMAP_TOS
ii. Facility ER Services are identified as having values of 801 and 802 in IMAP_TOS

-- Hospital Costs. Includes the facility cost of an inpatient stay and services provided by an outpatient facility other than those defined elsewhere (e.g., ER, Lab, Radiology, Other). These services include professional and facility emergency room services.
i. Inpatient Acute Services are identified as having a value of 601 in IMAP_TOS
ii. Non-Inpatient Acute Services are identified as having a value of 703 in IMAP_TOS

iii. Other Outpatient Hospital Services are identified as having values of 901 thru 1399 in IMAP_TOS

-- Laboratory Services. These services include professional and facility laboratory services, other than those professional services assigned to Primary Care Core.
i. Professional Lab Services are identified as having values of 2101-2118 (Professional, Lab) or 2501-2511 (Professional, Pathology) in IMAP_TOS
ii. Facility LAB Services are identified as having values of 1001 thru 1005 in IMAP_TOS

-- Radiology Services, Diagnostic. These services include diagnostic professional and facility radiology services, other than those professional services assigned to Primary Care Core:
i. Professional Radiology, MRI, CT Scan Services are identified as having values of 2901 thru 2903 in IMAP_TOS
ii. Facility Radiology, MRI, CT Scan Services are identified as having values of 1201, 1203, 1204 in IMAP_TOS
iii. Professional Radiology, Other Diagnostic Services are identified as having values of 2905, 2906, 2907, 2908 in IMAP_TOS
iv. Facility Radiology, Other Diagnostic Services are identified as having values of 1202, 1206, 1207, 1208 in IMAP_TOS
v. Note that Therapeutic Radiology is included in Specialty Care Services, Medicine

-- Specialty Care Services. These services include those services not identified above and are categorized as follows (including TOS_I values in IMAP_TOS):
i. Specialty Care, Other Diagnostic Testing
1. 1701-1733 (Professional, Diagnostic)
ii. Specialty Care, Evaluation & Management
1. 1601-1609 (Professional, Consult)
2. 2001-2013 (Professional, Inpatient Visit)
3. 2401-2411 (Professional, Office Visit)
4. 2717-2719 (Professional, Home Visit)
5. 2729-2731 (Professional, Domiciliary/Rest Home Visit)
6. 2801-2807 (Professional, Preventive Medicine)
7. Excludes any services assigned to Primary Care Core
iii. Specialty Care, Medicine
1. 1401-1405 (Professional, Allergy Tests)
2. 1901-1901 (Professional, Immunizations / Injection)
3. 2909-2915 (Professional, Therapeutic Radiology)
iv. Specialty Care, Surgery
1. 3001-3214 (Professional, Surgery)
v. Specialty Care, Other
1. 101-131 (Ancillary, DME)
2. 201-211 (Ancillary, Drug Admin)
3. 301-307 (Ancillary, Home Health)
4. 401-403, 431 (Ancillary, Services and Supplies)
5. 405-414 (Ancillary, Med and Surg Supplies)
6. 416-424 (Ancillary, Orthotics)
7. 425-429, 432 (Ancillary, Supplies)
8. 433-436 (Ancillary, Oxygen/Resp)
9. 437-446 (Ancillary, Prosthetics)
10. 448-449 (Ancillary, Vision)
11. 450-459 (Ancillary, Rpt/Trking)
12. 501-503 (Ancillary, Transportation)
13. 1501-1599 (Professional, Anesthesia)
14. 2203-2212 (Professional, Mental Health)
15. 2302-2317 (Professional, Obstetrics)
16. 2601-2625 (Professional, Phys Medicine/Rehab)
17. 2701-2715, 2721-2728 (Professional, Professional Other)

III. Utilization per 1,000 Episodes

Encounters are used for all utilization counts for the utilization measures described below.

Evaluation and Management Visits. E&M Visit services by all professional providers and include the following TOS_I values from IMAP_TOS:
i. 1601-1609 (Professional, Consult)
ii. 1803-1805 (Professional, ER)
iii. 2001-2013 (Professional, Inpatient Visit)
iv. 2401-2411 (Professional, Office Visit)
v. 2717-2719 (Professional, Home Visit)
vi. 2729-2731 (Professional, Domiciliary/Rest Home Visit)
vii. 2801-2807 (Professional, Preventive Medicine)

PCP Visits. PCP Visits include E&M visits rendered by a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Visits. Specialist Visits include E&M visits rendered by a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Referrals. A Specialist Referral is indicated using E&M visits and indicates the first instance of the Provider for an E&M service for that member. A specialist is a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

ER Visits. Indicates an ER service encounter. ER services are defined by a TOS_I value of Facility Outpatient, ER (801, 802) or Professional, ER (1803, 1805).

Radiology Services, Diagnostic. Radiology utilization is defined as an encounter for the following Types of Service:
-MRI/Cat Scans – Facility Outpatient (1201, 1203, 1204), Professional (2901, 2902, 2903)
-Other Diagnostic Radiology – Facility Outpatient, Diag. Radiology (1202, 1206, 1207, 1208), Professional, Diagnostic Radiology, Nuclear Medicine (2905 thru 2908)

Laboratory Services. Laboratory utilization is defined as an encounter for the following Types of Service:
i. Facility Outpatient, Lab (1001, 1003, 1005)
ii. Professional, Lab, (2101 thru 2118)
iii. Professional, Pathology (2501 thru 2511)

Pharmacy Services. A pharmacy service prescription record.

Inpatient Admits and Days. Number of unique inpatient stays. An inpatient stay describes the entire stay by a patient in a facility at the same level of care. Transfers to a different level of care at the same facility results in a new admission. Acute inpatient stays describe inpatient confinements in an acute care facility. Non-acute inpatient stays describe inpatient confinements in a skilled nursing facility, transitional care unit/rehab, or other longer term/sub-acute facility. Inpatient days describe the difference between inpatient admission and discharge dates. Inpatient stays where the admission and discharge dates are equal are assigned one inpatient day.

If needed, provide supplemental resource use service category specifications in either URL (preferred) or as an attachment: S9.7_RU_Categories.xls

If needed, provide specifications URL (preferred) or as an attachment:

URL:
Please supply the username and password:
Attachment: S9.7_RU_Categories.xls

S9.8. Care Setting; *provides information on which care settings the measure encompasses.*

Ambulatory Care : Ambulatory Surgery Center (ASC)
Ambulatory Care : Clinic/Urgent Care

Ambulatory Care : Clinician Office
Emergency Medical Services
Ambulance
Home Health
Hospice
Hospital/Acute Care Facility
Imaging Facility
Laboratory

S10.Adjustments for Comparability (Resource Use Measure Module 4)
External factors can mingle and affect or confound a measure's result. Confounding occurs if an extraneous factor causes or influences the outcome (e.g., higher resource use) and is associated with the exposure of interest (e.g., episode of diabetes with multiple co-morbidities). Measure developers often include steps to adjust the measure to increase comparability of results among providers, employers, and health plans.

S10.1. Risk adjustment method
Define risk adjustment variables and describe the conceptual, statistical, or other relevant aspects of the model and provide rationale for this methodology.

The attachment for S2 and responses to S8 above provided a description of the approach used by ETG to assign a severity score and level to each CAD episode. To do this, ETG first assesses the observed co-morbidities and condition status factors for an episode and the patient's age and gender. ETG then assigns a weight to each factor found to influence the relative risk of an episode of CAD. These weights and factors are condition-specific and were estimated using CAD episode results for a large population. The overall severity score for an episode is the sum of these weights for all factors observed. Using the severity score, a severity level is created, with each CAD episode assigned to one of four severity levels.

The approach used by ETG to assign episode severity has several advantages. First, the approach uses broad clinical profile of an episode, describing its clinical status and that of the patient. Second, the weightings assigned describe the incremental contribution of each factor to overall episode severity. Further, the approach used for severity is condition-specific – a separate model and weightings are constructed for each condition, including CAD. These severity results provide the key information required to support risk adjusted comparisons using CAD episodes.

Risk adjustment is an important step in resource use measurement. Measures of the cost of care for an organization or provider can be impacted by the underlying risk and severity of the patients they enroll or manage. Case-mix or risk adjustment addresses these differences and supports more consistent and equitable comparisons. These approaches allow a focus on differences in resource use deriving from differences in the practice of medicine rather than differences in the mix of episodes or patients.

The level of severity assigned by ETG to an episode is used to support risk adjustment. The risk adjustment approach includes three important steps:
-- Compute the observed experience for the provider being measured, across all episodes to be included in the comparison;

-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peers benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed;

--Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The table in S10.1 provides an example comparing the cost of care performance of two cardiologists using episodes of care and the condition of CAD. The analysis used only complete, non-outlier CAD episodes. The upper section of the table summarizes results at the condition and severity level. A higher severity level for a condition indicates the presence of one or more condition status factors and/or co-morbidities that impact the resources required for treatment.

The table also summarizes results for CAD, across all severity levels.

The table shows the number of episodes attributed to the cardiologist, the observed cost per episode, peers cost per episode (the "expected" amount), and the ratio of the cost per episode of the cardiologist to his peers. By condition and severity level, the peers cost per episode is the average experience of all cardiologists included in the measurement for those episodes. The peer's experience is risk adjusted and assumes the same mix of episodes (by condition and severity) as the physician being measured. Notice that for the overall CAD summary, the peers cost per episode for Dr. Jones is $2,081, while that amount for Dr. Smith is $1,841. The higher amount for Dr. Jones indicates a higher case-mix and greater expected costs relative to Dr. Smith. These peer amounts, adjusted for the specific mix of episodes observed for the physician being measured, capture the risk adjustment appropriate for the analysis.

In the last column, a relative cost ratio less than 1.00 indicates that the observed cost per episode for a provider is less than his peers. As shown, Dr. Jones cost is lower than peers and Dr. Smith is higher cost than peers. An additional report using the same measure information could summarize results by type of service, or specific utilization such as the use of a specific diagnostic test or treatment, providing greater insights into the factors behind differences in resource use. The risk adjustment for these measures would use the same approach as described here for total cost per episode.

If needed, provide supplemental information via a web URL (preferred) or attachment with the risk adjustment specifications.

URL:
Please supply the username and password:
Attachment: S10_Risk Adjustment Method Example.xls

S10.2. Stratification Method
Detail the stratification method including all variables, codes, logic or definitions required to stratify the measure and rationale for this methodology

ETG stratifies episodes by the intensity of service, or total cost. For a given episode, a severity score is assigned based on demographic factors (gender and age) and the presence of comorbidities and complications. The determination of this severity score is described in sections 8.3, 8.4 and 8.5. Once a severity score is determined, a severity level, a number between 1 and 4 is assigned based on a table that relates severity levels to severity scores for each ETG. The method for determining the severity levels is described in section 8.5. The severity level can then be used to stratify episodes by severity, measured as resource consumption.)

S10.3. Costing Method
Detail the costing method including the source of cost information, steps to capture, apply or estimate cost information, and provide rationale for this methodology.

The measure does not specify the specific costing method to be used for cost of care resource use measures. The financial amounts used should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example

S11. Measure Reporting (Resource Use Measure Module 5)
The measure developer must determine which of the following Measure Reporting functions: attribution approach, peer group, outliers and thresholds, sample size, and benchmarking and comparative estimates, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

S11.1. Detail attribution approach

Detail the attribution rule(s) used for attributing costs to providers and rationale for this methodology (e.g., a proportion of total measure cost or frequency of visits during the measure's measurement period) and provide rationale for this methodology.

Attributing patients and episodes to appropriate physicians and groups is a challenging step in cost measurement. Over some period of time a patient can have multiple conditions and, in many cases, multiple providers caring for the same condition. For example, for an episode of hypertension, a patient can be managed by their primary care physician, an internist, and also receive services from a cardiologist. For a patient with coronary artery disease, an internist, a cardiologist, and a surgeon can all play a key role in providing the patient's care. A methodology is required to identify these episodes for a patient and the providers responsible for the services performed within those episodes.
As a guideline, some principles are involved in determining a valid approach to be used in assigning episodes:
-- The approach must be valid conceptually. It must be defensible, understandable and accepted by providers, health plans, and other users of the measurement results;

-- The approach must be supported by readily available information, including the outputs from an episode grouping;

-- The approach should be robust across applications – working well for different sources of health plan data, patient populations and over time;

-- The approach should be flexible and consider the characteristics of the specialists being compared and the nature and severity of their patients and episodes;

-- Both activity-based and population-based approaches should be supported. An activity-based approach, describes attribution where an episode is assigned to the providers responsible for the greatest amount of activity during the course of the episode. Activity can be measured using different concepts including service costs, episode clusters, or patient visits.

A population, or panel-based approach is sometimes used when measuring performance for primary care physicians (PCPs), in particular where providers are performing a gatekeeper function for a population of members. In this case, responsibility for a member's qualified episodes of care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during those episodes.
-- "Sufficient" evidence of the provider's responsibility for the episode should exist. Thresholds should be considered that prevent providers from "winning" episodes where they have a small amount of involvement – relative to their physician peers or relative to all physicians involved in the episode.
-- Attributing the same episode to multiple providers in different specialties should be considered, when appropriate.

Care during an episode can include two types of services: services where important clinical decisions are made regarding the course of care and services that are a response to those decisions. Office visits, consultations and other evaluation and management services are examples of the first type of services. As part of these services, decisions to perform tests, prescribe drugs or order other ancillary services are made. The second type of service includes diagnostic lab, imaging, other tests, DME, drug therapies and treatments. These services are typically responses to decisions made regarding the course of care. Some services, such as surgery, may describe a closely linked bundle of care and relate to both categories – where the surgeon has some role in the decision to perform the procedure and also performs the surgery itself.

The dichotomy above suggests two important concepts for assessing approaches to attribution. First, the measure of "activity" to be used in identifying a responsible provider should focus on those types of service where decisions regarding the course of care and management of the episode take place. Second, the decision on the approach to be used for attribution may differ by specialty. In the case of a group of providers such as surgeons, where the majority of their services may be of the second type – after the decision to undergo surgery has been made – using cost as the activity measure for attribution may make sense. However in the case of PCPs or medical specialists, non-acute E&M visits or the number of episode clusters (qualified services), may be a superior service activity measure for determining episode responsibility.
As a guideline, four different general options for physician episode attribution can be considered to attribute episodes to individual providers – three activity-based and one population-based approach. Each of these options can be supported using standard outputs from ETG and the measures described in this submission. For each option, the description below assumes the following steps have been performed prior to attribution:

-- ETG episode grouping – producing the detail and summary output files to be used in attribution and measurement;

-- Identification of the comparison peer group and the individual physicians to be included;

-- The selection of qualified episodes for the peer group. Qualified episodes include those episodes with an ETG that matches the pre-defined list to be used for that peer group. Qualified episodes are further limited to complete, non-outlier episodes that fall within the time period defined for measurement.

For this discussion, it is assumed that the objective is to assign a single winner, if possible, for each peer group in which the episode is relevant, but allow providers in different peer groups to be assigned the same episode. To support this, the following logic would be applied separately, peer group by peer group. The activity-based options are described first. Although these approaches are described for attribution at the individual physician level, they could also be applied using physician groups as the unit for attribution.

Approach 1 - Physician Episode Attribution using Professional Service Costs. This attribution approach identifies the responsible physician for an episode as that provider rendering the greatest amount of professional service costs during the episode.
Professional services are those performed by a clinician in managing and treating the patient during an episode of care, including visits and consultations, surgery and therapies. Professional services exclude inpatient and outpatient services billed by a facility and also typically exclude ancillary services, such as laboratory, imaging, DME, injectibles, medical and surgical supplies, transportation, pharmaceuticals, etc. One modification of the "professional services" to be used in this attribution approach that has been proposed by some is the use of information on the "ordering" provider, for a pharmacy prescription or diagnostic test. If available, this information could be used to extend the concept of services "rendered" by a professional provider. Some ETG users have assigned total costs for a cluster to the cluster provider as a way to extend this type of concept for attribution – the argument being that cluster ownership may suggest that the physician played an important role in the decisions to perform the ancillary services grouped to the cluster.
Using professional service costs for attribution involves the following steps:
-- For each qualified episode, sum the costs of all professional services grouped to that episode, by physician.

-- Identify those physicians with episode costs (if any) that are also included in the peer group being measured Disregard any episodes without one or more physicians for that peer group;

-- Identify the peer group physician with the greatest amount of total costs. If two or more peers are found to have the most costs, apply an appropriate "tie-breaker" to determine the winning physician (discussed below).
-- For each physician, compute their professional costs, as a percentage of costs for all clinicians for the episode and also as a percentage of all costs for all physicians in the peer group. These amounts can be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).

After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest amount of professional costs, is the responsible provider for that episode for that peer group.

Approach 2 - Physician Episode Attribution using Episode Clusters. This attribution approach identifies the responsible physician for an episode as that provider in the peer group owning the greatest number of "clusters" within the episode. As described in the attachment for S.2, other than the individual service, the cluster is the basic unit of an ETG episode. Episode clusters are created using anchor records. Anchor records represent services provided by a clinician engaging in the direct evaluation, management or treatment of a patient. Office visits, therapies, and surgical procedures are examples. An anchor record indicates that a clinician has evaluated a patient's illness and has decided on the types of services required to further identify and treat the patient's condition. ETG links an anchor record with related services to form a cluster. Clinically homogeneous clusters are then combined to create episodes of care.
The clinical nature of an episode cluster makes it a natural candidate as an activity measure for episode attribution. In particular, the anchor records that define a cluster represent those types of service where decisions regarding the course of care and management of an episode take place. An additional benefit of episode clusters is that an anchor record service for a cluster can reside in another episode of care, but the cluster and cluster provider can still be identified for the episode of interest.
Using episode clusters for attribution involves the following steps:
-- For each qualified episode, sum the number of clusters "owned" by each clinician. The detail output file from ETG can be used for this purpose. For each service that can be assigned to an episode, the detail file identifies a unique cluster number and a cluster provider ID (same as the servicing provider ID for the cluster anchor record). Using this

file, the unique cluster providers for an episode and the number of clusters each provider owns can be identified.

-- Identify those physicians with episode clusters (if any) that are also included in the peer group being measured. Disregard any episodes without one or more cluster providers from that peer group;

-- Identify the peer group physician with the greatest number of episode clusters. If two or more providers are found to have the most clusters, apply an appropriate "tie-breaker" to determine the winning provider (discussed below).

-- For each peer group physician, compute their number of clusters, as a percentage of clusters for all clinicians for the episode and also as a percentage of all clusters for all physicians in that peer group. These amounts can be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).
After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest number of clusters is the responsible provider for that peer group.

Approach 3 - Physician Episode Attribution using Non-Acute Evaluation and Management (E/M) Visits. This attribution approach identifies the responsible physician for an episode as that physician providing the greatest number of non-acute E/M visits within the episode.
Non-Acute E/M services include office visits and consultations and other E/M services that occur outside of an acute setting where a provider is managing patients and their care. For example, these services exclude initial and subsequent inpatient visits, inpatient consultations, ER visits and critical care visits. It includes office visits and consults, home visits, SNF visits, psychiatric evaluations and therapy and preventive services.
The clinical nature of these services makes them a logical candidate as an activity measure for episode attribution. In particular, these services represent encounters where decisions regarding the course of care and management of an episode take place. This subset of services will be narrower than that described by episode clusters.
Using non-acute E/M visits for attribution involves the following steps:
-- For each qualified episode, sum the number of non-acute E/M visits (visits) rendered by each clinician during the episode.

-- Identify those physicians with these visits (if any) that are also included in the peer group being measured. Disregard any episodes without one or more visit providers from that peer group;

-- Identify the peer group physician with the greatest number of visits. If two or more providers are found to have the most visits, apply an appropriate "tie-breaker" to determine the winning provider (discussed below).

-- For each peer group physician, compute their number of visits, as a percentage of visits for all clinicians for the episode and also as a percentage of all visits for peer group physicians. These amounts can then be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).

After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest number of visits is the responsible provider for that episode for that peer group.
Approach 4 - Physician Episode Attribution using a Primary Care, Population-based Approach. As noted above, a "population" or "panel" based approach is sometimes used when measuring performance for peer groups comprised of primary care physicians. In particular, this approach is often considered where the PCPs are performing a gatekeeper function for a population of members. In this case, responsibility for a member's qualified episodes of care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during those episodes.
This approach requires two important steps:
-- Identification of a PCP for each member. This identification can often be obtained from the member's eligibility record which can include a notation of their assigned PCP for a period of time. Alternatively, a PCP can be "imputed" for a member based on that primary care specialist providing the greatest number of services or service costs for selected primary care. When imputing, the list of eligible providers is typically limited to those physicians involved in primary care. Using either approach, a member is linked to a PCP for a defined period of time.
-- For each qualified episode, identify the patient's assigned PCP during the episode period. Most users of this approach will select the member's assigned PCP at the beginning or ending date of the episode (episode begin and end date is available as part of the standard ETG output).
Using this approach, the peer group physician would be assigned all qualified episodes where they were determined to

be the patient's PCP during the defined time period.

Physician Episode Attribution – Other Issues. Some general issues around episode attribution remain. The first involves tie-breakers. When using activity-based attribution for some episodes, two or more providers may have the same amount of costs, clusters or visits. In this case, a tie-breaker is often applied to determine the responsible physician for the episode. Useful candidates for this purpose are the alternative activity measures described here. For example, if two physicians own the same number of clusters within an episode, the physician with the greatest amount of professional services costs could be selected. If a tie still remains, the physician with the greatest number of visits could be chosen, and so on.
A second issue involves setting appropriate thresholds to determine sufficient activity. As noted above, most activity-based attribution approaches involve some screening of the winning provider to ensure that they owned sufficient activity relative to their peers and to other providers during the course of the episode. This is typically done using two threshold comparisons – a provider's percentage of the total activity of peers and a provider's percentage of the total activity described by all clinicians for the episode. This percentage is then compared to a predefined threshold(s). For the physician with the greatest activity, if their percentages exceed both of these thresholds, they are determined to be responsible for the episode.
As an example, for an episode with 10 clusters, Dr. Jones is responsible for 2 of the 10 clusters and 8 other physicians are responsible for 1 cluster each. Even though Dr. Jones has the most clusters, he still may not be assigned the episode because his involvement was very small.
Most users set these thresholds at 25 or 30 percent. For example, the winning provider must own 25% or more of all of the episode clusters owned by peers and 25% or more of all episode clusters owned by all clinicians.
As a final point, it is useful to summarize the issues around allowing an episode to be attributed to multiple providers. As noted above, many ETG users who employ episode results to support physician measurement perform attribution separately for each specialty peer group of interest, including primary care. In doing this, they select a single winner, if possible, for each peer group in which the episode is relevant, but allow providers in different peer groups to be assigned the same episode, if attribution requirements are met.
In this way, it is theoretically possible to assign more than one physician to an episode if each peer group is considered separately. Users typically do not assign two physicians from the same peer group to the same episode.
To support multiple attribution across peer groups, users would repeat the attribution step selected from above separately for each peer group. Those physicians both meeting the dominant provider status for their peer group and also exceeding the threshold requirements could be responsible for the episode.

S11.2.Identify and define peer group
Identify the peer group and detail how peer group is identified and provide rationale for this methodology

Guidelines : Peer groups define the group of physicians being compared. For example, a common practice in physician episode measurement is to assess the actual costs for those episodes attributed to an individual physician or practice and compare actual costs to peer results, risk adjusted to support more valid comparisons. The peer values use in these comparisons will be influenced by the selection of providers included in the peer group.

In defining a peer group for cost of care measurement, most organizations will include physicians from the same specialty or area of expertise. For organizations with a network covering broad geographic area, some distinction by provider geography can also be used. Internal medicine, cardiology, or general surgery within a certain geographic area are examples of a peer group. Although not directly related to defining a group of providers as peers, many organizations provide separate measurements by line of business, separating results and peer comparisons by commercial, Medicare and Medicaid products.

S11.3. Level of Analysis:

Clinician : Group/Practice
Clinician : Individual
Clinician : Team
Facility
Health Plan
Integrated Delivery System
Population : Community
Population : County or City

Population : National
Population : Regional
Population : states

S11.4.Detail measure outliers or thresholds
Detail any threshold or outlier rules and decisions based on measure resource use and provide rationale for this methodology

Guidelines : Outlier episodes – as a guideline, low outlier cost episodes should be excluded from resource use measurement. High outlier cost episodes should be included, but all costs truncated at the high outlier cost threshold used for the episode (a technique called "winsorization"). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier episode.

S11.5.Detail sample size requirements
Detail the sample size requirement including rules associated with the type of measure

Guidelines : The choice of sample size is less important using techniques that include statistical methods that find only statistically significant difference. If your choice of sample size is low, you will not find many cases that are statistically significantly different. A sample size of 30 is chosen because this is when the normal distribution is a good approximation of the student's t distribution. However, the choice of sample size is less critical when using tests of statistical significance.

S11.6.Define benchmarking or comparative estimates
Detail steps to produce benchmarking and comparative estimates and provide rationale for this methodology

Guidelines : The response to section S10.1 includes examples on how to compare the results for a physician with that of their peers or with external best practice benchmarks. As a guideline, in making comparative estimates, the following considerations should be made:

-- As described in S10.1, comparative results should be risk adjusted to support more valid comparisons;

-- Differences in fee schedules and contracts – for some comparisons using cost of care, differences between actual practice and the benchmark can be influenced by different unit pricing assumptions. In these cases standard pricing or general adjustments to cost levels can be made; and

-- Practice styles and service utilization can differ between geographic areas and also between physicians in different specialties. Although comparisons across areas and specialties can provide insights, proper care should be taken in interpreting and communicating results.

S12.Type of Score:

Continuous variable
Count
Rate/Proportion
Ratio

If available, please provide a sample report:

S12_sample_score_report_EPI-634387141970885022.pdf

S12.1. Interpretation of Score.
(Classifies interpretation of score (s) according to whether higher or lower resource use amounts is associated with a higher or lower score, a score falling within a defined interval, or a passing score, etc)

The measures described in this submission include continuous cost measures, counts of utilization, rates and

proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons.

For the continuous cost per episode measures (also a rate), an increase in costs can be interpreted as an increase in the resources used to diagnose, manage and treat the episodes in question. This score provides a representation of the weighted utilization expended, where the weights are based on the cost assigned to each individual service.

For the counts of utilization measures per 1,000 episodes (also a rate), an increase in utilization can be interpreted as an increase in the resources used to diagnose, manage and treat the episodes in question. This score provides a representation of un-weighted utilization. Counts of utilization measures are most useful when the services being aggregated are similar (e.g., inpatient admits, E&M visits, MRI services).

The risk adjusted observed to expected cost or utilization ratio (O/E ratio) includes three important steps:
-- Compute the observed experience for the provider being measured, across all episodes to be included in the comparison;

-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peers benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed;

-- Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The O/E ratio (relative resource use ratio) can be interpreted based on its magnitude and relationship to a peer average or other guidelines. A relative cost ratio less than 1.00 indicates that the observed resource use per episode for a provider is less than his peers. A relative cost ratio greater than 1.00 indicates that the observed resource use per episode for a provider is greater than his risk adjusted peers.

S12.2. Detail Score Estimation
Detail steps to estimate measure score.

The measures described in this submission include continuous cost measures, counts of utilization, rates and proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons. The continuous cost measures, counts of utilization, and rates per episode are described in detail in S9.5. The details involved in computing the O/E ratio measure is provided in S10.1.

S12.3. Describe discriminating results approach
Detail methods for discriminating differences (reporting with descriptive statistics--e.g., distribution, confidence intervals)

In all of these measures we end up with an O/E ratio for a provider. In order to determine the statistical accuracy of this measure we start by measuring the variance of this metric:
Var(O/E)
The Variance of this metric has been estimated by the following expression in a number of journal articles :
Var(O/E)=(Sum(Var(Oi))/[Sum(Ei)]2
Where Var(Oi) is the variance for each of the physician's episodes across all episodes in it's statistical unit for the peer group.
Then the standard error (SE) for this measurement is Sqrt(Var(O/E).
Finally, a 95% confidence interval could be calculated by:
(O/E-1.96*SE, O/E+1.96*SE)
Alternatively, a 90% confidence interval could be calculated by: (O/E-1.64*SE, O/E+1.64*SE)

Adams et al. BMC Health Services Research 2010, 10:57 http://www.biomedcentral.com/1472-6963/10/57

Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. See guidance on measure testing.	**Rating**
TESTING ATTACHMENT (5MB or less) or URL: ***If needed, attach <u>supplemental</u> documentation (Save file as: SA_Reliability_Validity Testing) All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.*** URL: Please supply the username and password: Attachment: SA_Reliability_Validity Testing_CAD.xls	
SA1. Reliability Testing ***For each module tested or for the overall measure score:*** **SA1.1. Data/sample** ***(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)*** Data used to support validity testing is based upon a National Commercial member health care services benchmark database representing more than 25 million covered lives for calendar year 2009. Various permutations of the 25 million unique members are pulled to support testing initiatives, for example: -4 million member sample used for face validity evaluation of ETG processing -7 million member sample used for reliability evaluation of ETG processing and associated Resource Utilization measures -75,000 member sample, with manipulated data for content validation testing of ETG processing and associated Resource Utilization measures **SA1.2. Analytic Methods** ***(Describe method of reliability testing and rationale)*** Reliability refers to the consistency of a measure. A measure is considered reliable when the same result is produced repeatedly. Reliability of ETGs and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of a benchmark database of member and health care services covering more than 25 million lives as described in SA1.1. The second level of internal consistency reliability involves detailed parallel processing comparisons between ETG and Resource Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios. **SA1.3.Testing Results** ***(reliability statistics, assessment of adequacy in the context of norms for the test conducted)*** The extensive testing of ETG produces volumes of results across the test cases and other concepts described above. In terms of validity and assessing the reliability of the implementation, testing of the measurement software with the parallel SAS prototype involves iterations until a high degree of matching of results is observed (over 99.9%). The statistic used in this testing is the exact match of the grouping of records and assignment of resource measures. The	**2a2** **H☐** **M☐** **L☐** **I☐**

difference in the result for each measure between the methodology and prototype is calculated and differences equal to zero are considered an exact match.

In terms of testing of measures across organizations, the following results provide examples of consistency for the submitted measures. These data were not standard priced, so some observed variation is the result of differences in fee schedules and contracts between the organizations. A table, "Reliability Across HCOs" is included in the attachment for SA (SA_Reliability_Validity Testing). The table shows measures of resource use for nine healthcare organizations (HCOs) (columns) with a separate comparison provided for selected resource use measures included with this submission. (The 7 million member sample from 9 health care organizations used for reliability assessment described in SA1.1). The results include combined findings across all severity levels for the base condition, with results risk adjusted to reflect the same mix of episodes by severity level across each organization. Separate results are shown for relevant peer groupings (e.g., internal medicine, cardiology). These peer group results are based on episode attributed to each provider, with the estimates describing the peer level findings across all physicians and episodes included in the measurement. As shown, the results suggest a level of consistency across health plans implying reliability in both the measure specification and how it can be applied to different organizations.

A further assessment of reliability and face validity can be made using measure results attributed to physicians in different specialties. The tables, "Results Across PeerGrps, Cost" and "Results Across PeerGrps, Utils" included in the attachment for SA (SA_Reliability_Validity Testing). Provide a comparison of the cost and use per episode for episodes attributed to different specialties. The tables also show results by episode severity level, supporting an assessment of how cost and use measure results vary as severity level increases. The results also show a strong relationship between episode severity and resource use.

SA1.4.Finding statement(s)—*(i.e., is the measure deemed reliable, limitations identified)*

As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies.

SA2.Validity Testing
For each module tested or for the overall measure score:

SA2.1. Data/Sample
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Different samples of data are used in testing ETG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-4 million member sample used for validity and reliability of the ETG methodology and the software used for ETG processing;
-250,000 member sample, with manipulated data for content validation testing of the post-ETG processing associated with Resource Utilization measures (measures described in S9.5);
-7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

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SA2.2.Analytic Method
(Describe method of validity testing and rationale; if face validity, describe systematic assessment)

Also, please see our responses to SA1 which relate to both reliability and validity.
Validity determines if the output of the measure is accurate. The measure must be valid in order for the results to be accurately applied and interpreted. Validity of a measure is not determined by a single statistic, but by evaluating the complete result of the measures and demonstrating the relationship between the result and the intended purpose of the measure. Validity of ETGs and Resource Use Utilization Measures are judged based upon both content validity and face

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validity.

Content validation testing involves detailed parallel processing comparisons between ETG and Resource Use Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing valid results using a variety of processing configuration options and data input scenarios.

The face validity approach assesses if the measure result is reasonable and functioning according to expectations. This form of validation is most typically performed when modifications to the methodology intentionally change the result of the measure. When this occurs a pre- and post-modification parallel run is created and changes in the measure output are validated for accuracy at face value. Episodes are evaluated for validity in terms of distribution of ETGs, Episode Types, Record Types, Outlier Status and Type of Service. Resource Utilization Measures are evaluated for validity in terms of measure Cost per Episode by Peer Group as well as overall evaluation of the utilization measures by Peer Group.

SA2.3.Testing Results
(statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment)

Please see our responses to SA1 which relate to both reliability and validity.

SA2.4. Finding statement(s)—(*i.e., is the measure deemed reliable, limitations identified)*

Please see our responses to SA1 which relate to both reliability and validity.

SA3.Testing for Measure Exclusions

SA3.1. Describe how the impact of exclusions (if specified) is transparent as required in the criteria

ETG includes logic to identify high or low cost outliers at the episode level. In particular, ETG has a comprehensive method for identifying outlier episodes where the resource cost is high or low enough relative to norms for the clinical condition to distort the results. A table of thresholds, or "trim points", is used to describe levels of costs considered extremely high or low relative to the norm. Specific trim points are defined for each base condition (e.g., CAD) and also for each level of severity and the presence of surgical treatments. These values have been determined using a benchmark database describing the experience of more than 25 million covered lives. Note that severity of illness and treatment indicators are assigned as described in the general methodology paper on ETG included in the response to S2. Low and high outlier episodes are noted by ETG.

2b3

As described in the general methodology paper on ETG (included in the response to S2), ETG considers an episode incomplete if the clean period of the episode overlaps with the boundaries of the overall time period being used for measurement (e.g., calendar years 2009 and 2010) or the member's eligibility start and end dates. Incomplete episodes may have either an unknown start or an unknown finish. ETG clean periods are described in detail in the general methodology paper on ETG (see S2 response). To summarize, clean periods describe the amount time before and after an episode where clinical activity related to the episode is assessed to determine episode completeness. If no relevant clinical activity is observed and the clean period does not overlap with the overall analytic time period begin and end dates or the member's eligibility begin and end dates, the episode can be considered complete. Different rules are applied to acute and chronic episode conditions to do this. Complete and incomplete episode status and type are noted by ETG.

It is recommended that incomplete episodes be excluded from resource use measurement and comparisons. It is recommended that low outlier cost episodes be excluded from resource use measurement. It is recommended that high outlier cost episodes be included in resource use measurement, but truncated at the high outlier trim point.

In terms of resource use measure construction following ETG grouping, no additional data inclusion or exclusion are applied. Only condition episodes are included in the measurement of episode-based resource use for that condition,

H☐
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I☐

including the individual services that ETG groups to those episodes. As noted, it is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated as described above.

SA3.2. Data/sample for analysis of exclusions
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Different samples of data are used in testing ETG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-4 million member sample used for validity and reliability of the ETG methodology and the software used for ETG processing;
-250,000 member sample, with manipulated data for content validation testing of the post-ETG processing associated with Resource Utilization measures (measures described in S9.5);
-7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA3.3. Analytic Method
(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference)

Reliability and testing of exclusions for ETGs and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of the benchmark described above in SA2.1.

The second level of internal consistency reliability for exclusions involves detailed parallel processing comparisons between ETG and Resource Use Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios.

As an example, the text below provides the Table of Contents for an ETG testing plan for ETG Version 7.0. The plan includes processes around data used, test cases created, comparison of software results with those produced by a SAS prototype (to determine matching across parallel implementations of the methodology), and a review by clinical analysts to assess face validity. A similar testing approach is used for the resource use measures that are processed following ETG grouping. Note that steps 2.4 and 2.5 relate to exclusions around episode completeness and outlier status.

ETG TEST PLAN DOCUMENT – EXAMPLE TABLE OF CONTENTS
SECTION 1—OVERVIEW
1.1 PURPOSE OF TEST PLAN DOCUMENT
1.2 TESTING APPROACH AND DELIVERABLES
1.3 SCOPE OF TESTING
1.4 DATA
1.5 ETG GROUPER
SECTION 2—BENCHMARK TEST CASES
2.1 ACCOUNTING OF GROUPED VS. UNGROUPED RECORDS
2.2 DISTRIBUTION BY ETG
2.3 DISTRIBUTION BY MPC

2.4 DISTRIBUTION BY EPISODE COMPLETENESS 2.5 DISTRIBUTION BY OUTLIERS 2.6 EPISODE AGE/GENDER PROFILE SECTION 3—FEATURE-RELATED TEST CASES 3.1 COMPARISON OF SOFTWARE TO PROTOTYPE 3.2 SEVERITY ADJUSTMENT 3.3 COMPLICATIONS 3.4 COMORBIDITIES 3.5 TREATMENT INDICATORS 3.6 EPISODE INDICATORS SECTION 4—REVISION HISTORY Finally, the results are applied to the healthcare data of different organizations to assess both the ability of the organization's data to support the measurements and also the consistency of results across the organizations. This assessment of reliability also provides evidence that the measures are being applied in a consistent and valid way. **SA3.4. Results** ***(statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses)*** See Attachment SA_Reliability_Validity Testing for a comparison of episode outlier and completion results across sources of data from ETG processing. **SA3.5. Finding statement(s)-- *(i.e., is the measure deemed reliable, limitations identified)*** As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies. This statement applies to all methodologies involved, including exclusions. **SA4. Testing Population** ***Which populations were included in the testing data? (Check all that apply)*** Commercial	
SA5. Risk adjustment strategy ***Refer to items S10.1 and S10.2 to rate this criterion.***	**2b4** **H☐** **M☐** **L☐** **I☐**
SA6. Data analysis and scoring methods ***Refer to items S12-S12.3 to rate this criterion.***	**2b5** **H☐** **M☐** **L☐** **I☐**
SA7. Multiple data sources ***Refer to S7 & all SA1 items to evaluate this criterion.***	**2b6** **H☐** **M☐** **L☐** **I☐** **NA☐**
SA6. Stratification of Disparities (if applicable) ***Refer to item S10.2 to rate this criterion.***	**2c** **H☐**

	M☐ L☐ I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties*?	
Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met? **Rationale:**	Y☐ N☐
USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.	**Eval Rating**
Meaningful, Understandable, and Useful Information **U1. Current Use:** Internal quality improvement Payment Public reporting (disclosure to performance results to the public at large) Quality improvement with external benchmarking **U1.1. Use in Public Reporting Initiative Use in Public Reporting.** ***Disclosure of performance results to the public at large (If used in a public reporting program, provide name of program(s), locations, Web page URL(s). If not publicly reported in a national or community program, state the plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement)*** Several users of ETGs and Resource Use Measures rely on the analysis to support Public Reporting initiatives. Examples include: -- Health Care Organization #1: Measuring Provider Efficiency -- HCO #1 ranks providers based on efficiency by ETG using a single provider ETG overview. Using COGNOS reporting capabilities the organization is able to drill down into procedure and drug level comparisons. -- Health Care Organization #2: Corporate Wellness Programs -- HCO #2 uses ETG output to analyze utilization patterns and identify potential diseases and populations to target for intervention. ERGs are used to adjust the average and comparison population expenditures and Specialty profiles are created using both ETG and ERG results. ERG scores are used to identify patients who could be potential high utilizers. -- Health Care Organization #3: Physician Profiling and Clinical Benchmarking -- HCO #3 has embarked upon an initiative to use ETG information for clinical reporting and benchmarking. ERG output complements the ETG information for underwriting and physician profiling programs as well. -- Health Care Organization #4: Provider Specialty Profiling and Predictive Modeling -- HCO #4 utilizes Resource Use Measures and ETG to identify variations in practice patterns, measure performance and examine utilization and disease management. The primary focus is on high cost specialties and ETGs are used to identify the top 5 conditions to support specialty profiles and cost comparisons and drill downs. ERG scores are used to risk adjust PCP profiles to adjust for patient severity. Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request. **U1.2. Use in QI** ***(If used in improvement programs, provide name of program(s), locations, Web page URL(s)).*** Examples of ETGs and Resource Use Measures in action within health care industry quality improvement initiatives include: -- Health Care Organization #5: Internal Quality Improvement – Disease Management	**3a** H☐ M☐ L☐ I☐

-- HCO #5 utilizes 30 months of medical and pharmacy data totaling more than 17 million claim lines to support identification of member risk and stratification of members for care management teams. ETG and ERG groupers are embedded within their claims datamart with other sources of data and support the identification of clinical care gaps and impactable dollars for quality improvement.
-- Health Care Organization #6: Employer Group Utilization Reports to Identify Provider Variance
-- HCO #6 generates Employer or Account Group Utilization Reports which includes a global view of ETGs for the population. These reports are used to identify the top 5 ETGs where variance is the greatest to target specific procedures for a particular ETG in order to improve quality for the Employer group.
-- Health Care Organization #7: Cesarean Section Study
-- HCO #7 conducted a study on Cesarean Section, Infertility and multiple births using ETGs. Providers with high rates of Cesarean Section were identified and compared based upon severity indices. The study determined that multiple births were a significant contributor to a market's cost and procedure variances. The study further identified infertility treatment specialists who need improvement based upon the comparison to their peers of best practices and procedures.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request.

U1.3. Use for other Accountability Functions (payment, certification, accreditation)
(If used in a public accountability program, provide name of program(s), locations, Web page URL(s).

Other examples of industry use of ETGs and Resource Use Measures include Provider Pay for Excellence programs and Member Cost Analysis Tools. Specific examples include:
-- Health Care Organization #8: Provider Analytics Team
-- HCO #8 leverages the power of ETGs and Resource Use Measures to support their internal Provider Analytics team. This team manages the Provider Profiling program to support the Medical Directors' high-level physician review and network physician meetings as well as bi-annual provider profiling reports. In addition to provider profiling the Provider Analytics team uses ETG and Resource Use Measures to Impute PCP information to identify gaps in care, support physician group award programs and Patient Centered Medical Home projects.
-- Health Care Organization #9: Member Cost Analysis Tools
-- HCO #9 has created a patient website with cost calculation tools to provide detailed treatment costs for the patient based upon ETG analysis. The website includes tips on how to reduce costs as well as a pharmacy co-pay calculator. Users may access median cost reports for an ETG as well as cost ranges for procedures based upon CPT codes, pharmaceuticals and office visits. The website also provides comparison data for providers based upon performance indices.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request

U2. Testing of Interpretability
(Provide a rationale for why the measure performance results are meaningful, understandable, and useful to the intended audience(s) for both public reporting and quality improvement).

U2.1. If understanding or usefulness was demonstrated
(e.g., through systematic feedback from users, focus group, cognitive testing, analysis of quality improvement initiatives) describe the data, methods, and results.

The assessment of the usability of the results from ETG-based measures of resource use is primarily from two entities: the ETG Medical Advisory Board and the Ingenix User Forums around these measures. The Medical Advisory Board is comprised of medical directors from healthcare organizations that employ episode based measures to assess resource use. Input and feedback from these clinicians inform both the ETG methodology itself and also how it is used in creating and sharing provider measurement results. The Ingenix User Forums include technical experts from organizations that use ETG. Similar to the Medical Advisory Board, input and feedback from this group informs the ETG methodology, but primarily is focused on how ETG results are used to create and share provider measurement results.

3b

H☐ M☐ L☐ NA☐

U2.2. Resource use data and result can be decomposed for transparency and understanding. ***Refer to items S11 -S12.3.***	**3c** **H☐** **M☐** **L☐** **I☐**
U3. If there are similar or related measures (either same measure focus or target population) measures (both the same measure focus and same target population), list the NQF # and title of all related and/or similar measures. **U3.1. If this measure has EITHER the same measure focus OR the same target population as NQF-endorsed measure(s): Are the measure specifications completely harmonized?** **U3.2. If the measure specifications are not completely harmonized identify the differences, rationale, and impact on interpretability and data collection burden.** ***Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)***	**3d** **H☐** **M☐** **L☐** **I☐** **NA☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?	
Steering Committee: Overall, to what extent was the criterion, *Usability*, met? **Rationale:**	**H☐** **M☐** **L☐**
FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement.	Eval Rating
F1. Data Elements Generated as Byproduct of Care Processes ***How are the data elements needed to compute measure scores generated? Data used in the measure are:*** Generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims)	**4a** **H☐** **M☐** **L☐** **I☐**
F2. Electronic Sources ***Are the data elements needed for the measure as specified available electronically? (Elements that are needed to compute measure scores are in defined, computer-readable fields)*** ALL data elements in electronic claims **F2.1. If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.**	**4b** **H☐** **M☐** **L☐** **I☐**

F3. Susceptibility to Inaccuracies, Errors, or Unintended Consequences ***Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to minimize or prevent. If audited, provide results.*** The main source of inaccuracies relate to small sample size. There are lower limits on the number of episodes for a given provider or specialty that are allowed for inclusion in the analysis. Sample sizes that are determined to be too small are eliminated from the analysis. These situations will occur infrequently, as the sample sizes that are customarily dealt with are very large. A methodology for applying statistical techniques to determine confidence intervals of the results has been created and can be applied to gauge the accuracy of the analysis. In addition, sample size is less of an issue when multiple episode types are combined for a single metric. In some cases, there are physicians that are "ultra" specialized that may not have a reasonably sized peer group for comparison. Sub-specialties like hepatology, or muscular dystrophy specialists may fall into this category.) A second source of potential inaccuracies relate to the validity and completeness of the administrative data available to support the measurement. As described in S6.1, a careful evaluation of the data to be used to support the measurement is required and actions taken to address identified issues.	**4c** H☐ M☐ L☐ I☐
F4. Data Collection Strategy ***Describe what you have learned/modified as a result of testing regarding barriers to operational use of the measure (e.g., availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, cost of proprietary measures).*** The measure is in use beyond internal QI. Please see the section on Usability.	**4d** H☐ M☐ L☐ I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility*?	
Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met? **Rationale:**	H☐ M☐ L☐
RECOMMENDATION	
Steering Committee: Do you recommend for endorsement? **Comments:**	Y☐ N☐ A☐
CONTACT INFORMATION	
Co.1 Measure Steward (Intellectual Property Owner) **Co.1 Organization** Ingenix, 950 Winter Street, suite 3800, Waltham, Massachusetts, 02451 **Co.2 Point of Contact** Jennifer, Pearse, Jennifer_J_pearse@ingenix.com, 781-419-8628-	

Measure Developer If different from Measure Steward

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Co.5 Submitter If different from Measure Steward POC

Jennifer, Pearse, Jennifer_J_pearse@ingenix.com, 781-419-8628-, Ingenix

Co.6 Additional organizations that sponsored/participated in measure development

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.2 Year the measure was first released:

Ad.3 Month and Year of most recent revision:

Ad.4 What is your frequency for review/update of this measure?

Ad.5 When is the next scheduled review/update for this measure?

Ad.6 Copyright statement/disclaimers:

Information submitted is confiential/propietary to Ingenix, copyright 2011

Ad. 7 Date of Submission (*MM/DD/YY*)**:**

04/18/2011

INGENIX

ETG METHODS DOCUMENT
Building Episodes with Episode Treatment Groups (ETG): General Methodology and Application for CORONARY ARTERY DISEASE (CAD)

This document provides an overview of the Ingenix Episode Treatment Groups (ETG) methodology and its application for creating CAD episodes of care. ETG groups individual medical and pharmacy services to unique episodes of care defining a condition for a patient and is used extensively to support episode-based measurement of cost of care. The first section of this document describes the general approach used by ETG. The second section beginning on page 12 summarizes methods for CAD.

I. Episode Treatment Groups (ETG) Construction Logic

ETG is an episode grouping methodology that identifies a unique clinical condition for a patient and the services involved in diagnosing, managing and treating that condition. ETG organizes routinely-collected professional, inpatient, outpatient and ancillary services, including pharmaceutical services, into episodes of care. ETG evaluates each claim service record with respect to provider type, procedure and diagnoses codes and other information to assign the record to an appropriate episode. In doing this, all conditions and episodes are considered for a patient, including concurrently occurring conditions.

ETG covers the breadth of clinical medicine. Examples of ETG based conditions include diabetes, asthma and chronic sinusitis. Each episode is further assigned a condition-specific severity level, supporting case-mix adjusted comparisons within and across conditions.

ETG uses as input data information from administrative medical and pharmacy claim service records and encounters describing the individual services provided to a patient. ETG also uses information describing each patient, including age and gender and time enrolled with a health plan or other organization.

The Episode Building Process

The ETG episode building process has four important steps:

1. Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
2. Build Episodes from Anchor Records
3. Group Non-Anchor Records to Episodes
4. Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

Step 1: Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures

Assign record type to each Service

In building an episode the first step involves assigning a Record Type to each service record. The Record Type assigned to a record is determined by the Provider Type, Procedure Code and/or Revenue Code Service, and National Drug Code (NDC) (if any), on the record. Provider Type values are based on

the mapping of individual provider specialties to one of three values recognized by ETG: Clinician, Facility and Other. The Provider Type values and their definitions are as follows:

Provider Type	Definition
Clinician	Providers who make diagnoses and recommend treatment
Facility	Acute and long term care providers such as short-term hospitals, skilled nursing facilities, and psychiatric or chemical dependency facilities
Other/Non-Clinician	All other healthcare providers

Identify Anchor Records

Service records containing a NDC code are assigned a Pharmacy Record Type. For other services, ETG assigns one of the following Record Types to the service record using Provider Type and the procedure/revenue code and also determines if that Record Type can anchor (begin or continue) an episode. The following table describes the Record Type and Anchor relationship:

Record Type	Record Type Value	Anchor or Non-Anchor
Management	A record submitted by a clinician for services related to the evaluation of a patient's condition.	Anchor
Surgery	A record submitted by a clinician for surgical or related procedures.	Anchor
Ancillary	A record submitted by any provider for laboratory, radiological or similar services.	Non-Anchor
Facility	A record submitted by a treatment facility for room & board services.	Anchor
Pharmacy	A record for a prescription drug service.	Non-Anchor

Most management records contain evaluation and management CPT-4 codes. Surgery records are primarily procedural CPT-4 codes. Facility records are room and board revenue codes billed by a facility (also referred to as a confinement). Pharmacy records are claims containing a NDC or certain HCPCS codes related to the administration of a drug. Record Types of management, surgery and facility are considered *anchor* records. The identification of an anchor record is significant because it indicates that a clinician has evaluated a patient, and has decided on the types of services required to further identify and treat the patient's condition. Non-anchor records describe *ancillary* services that aid in evaluating and treating the patient, such as x-rays and laboratory services.

Assign Diagnoses to Diagnosis Class

The way in which records are grouped to an episode is governed mainly by the diagnosis, revenue, and procedure codes on the service record. Each ICD-9-CM, CPT-4/HCPCS, and revenue code has been mapped to ETG concepts through extensively vetted and continually updated clinical tables. (ICD-9 procedure codes are not used in grouping.)

Diagnosis Codes

The software relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG.

- Sign and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition.

The software runs one member at a time and processes the anchor records with a 365-day moving window. The diagnosis codes are grouped in several distinct passes. This is done so that the grouper processes the more specific codes first, leaving the sign & symptom codes until later, when it is more likely that there is a more specific episode for these claims to join.

Each diagnosis code is matched with one or more ETGs through a diagnosis eligibility table. The exception is 'E' codes which are not grouped. Each diagnosis code is further ranked, based on its strength of association with the ETG. The rank values are as follows: low, medium, high and primary. Low, medium, and high represent the strength of the match association. A primary rank describes conditions that define a disease and are the main codes that impact grouping decisions. The grouper first processes the specific and non-specific diagnosis codes so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to.

Identify the Clinical Relationship Between Diagnosis Codes and Conditions

Match each diagnosis code with one or more conditions (ETGs) through a diagnosis eligibility table. In addition to mapping diagnosis codes to conditions, each diagnosis code is further ranked, based on its strength of association with a condition. A rank of "primary" or "incidental" is assigned to each diagnosis and condition combination, with a further ranking assigned to incidental relationships:

- Primary: A "primary" diagnosis/condition relationship is assigned in a map where the diagnosis defines that condition. (Note: the word "primary" here is used to describe the relationship between a diagnosis and an episode, it is not used to indicate the position of the diagnosis code on the claim line. The diagnosis in any position on the claim line can have a primary relationship with an ETG). This map is used to identify primary diagnoses for the ETG. Primary diagnosis codes can only be ranked as primary for a single ETG condition.

- Incidental: These diagnosis codes are eligible for a condition but are not classified as primary. These diagnosis codes can be incidental to other conditions. To support the linkage of these diagnosis codes to a final episode, a further ranking is assigned for each condition based on the relative strength of association between the diagnosis and condition. Values of low, medium, or high are assigned for each diagnosis/condition.

Identify Relationships between Procedure Codes and Conditions

In building episodes, the procedure or revenue code can help to identify the ETG to which a particular claim record can be assigned. A given procedure may be valid for several ETGs, though not equally so. A procedure eligibility table therefore ranks the valid ETGs for each procedure to give a better sense of how closely related the service is to each ETG. The ranking options are: Very Low, Low, Medium, and High, with High being the strongest rank.

The following table provides an example of a rhinoplasty surgical procedure and selected ETGs it is eligible for and the rank for each ETG.

ETG	Rank
Trauma to ear/nose/throat	High
Other inflammatory conditions of ear/nose/throat	High
Allergic rhinitis	Medium
Chronic sinusitis	Medium
Trauma of oral cavity	Medium
Open fracture or dislocation - head & face	Medium
Congenital & acquired anomalies of ear/nose/throat	Medium
Closed fracture or dislocation – head & face	Low

Cocaine or amphetamine dependence	Very Low
Other disorders of ear/nose/throat	Very Low

For a record to be eligible to start or join an episode, the diagnosis code and the procedure/revenue code must both be eligible for an ETG. Where an anchor record can be assigned to more than one observed episode for a patent, the record is assigned to an episode according to the best combination of the procedure/revenue code and the diagnosis code.

- ❖ The ETG Online Clinical Knowledge Base application on the Ingenix website (www.ingenix.com/transparency) provides more information about the diagnosis and procedure associations to an ETG.

Identify Relationships Between Pharmacy Services and Conditions

The relationship between pharmacy services and episodes is based on the pharmacy code assigned to the service in a mapping. To support this assessment, the ETG methodology assigns each pharmacy service to a Drug Category Code (DCC). The DCC describes the drug's active ingredients and route of administration. DCCs are then mapped to ETGs and define the relationships between a drug and a condition. Most pharmacy services are defined using NDC procedure codes, however selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC by ETG (e.g., J-codes describing injections).

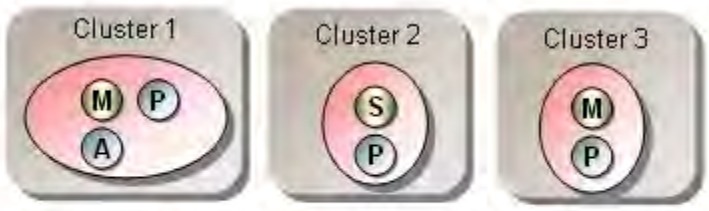
Step 2: Build Episodes from Anchor Records

Only anchor records can start or continue an episode.

Anchor records can do the following:

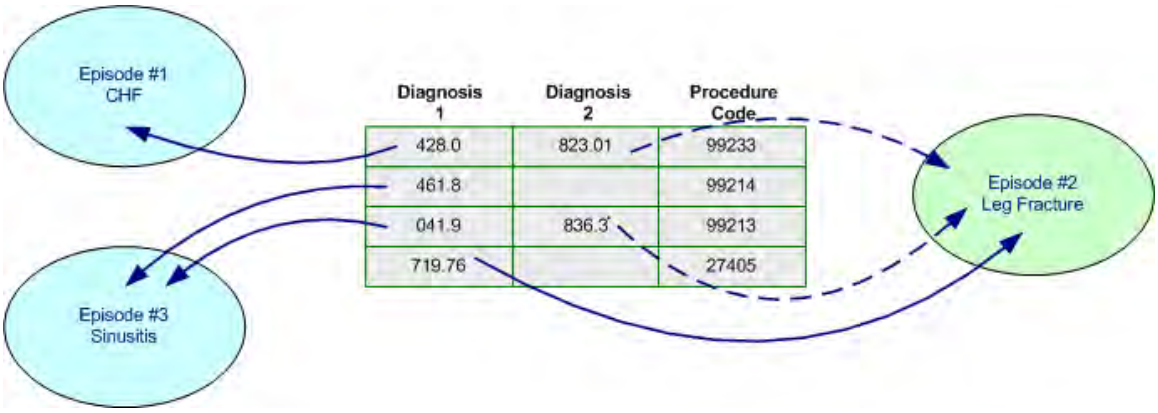
- Begin a *cluster* that can open a new episode or join an existing episode
- Extend an episode (time-wise) – providing evidence that the episode has not yet completed
- Create one or more or *phantom* clusters – when there are multiple diagnosis codes on the same anchor record
- Determine if episodes incur complications, comorbidities and significant surgery/treatment

Each anchor record forms a cluster. A cluster is the basic unit of an episode. Each cluster is comprised of an anchor record and zero, one, or more ancillary and pharmacy records. Each episode consists of one or more clusters. The illustration below demonstrates this concept, showing management (M), ancillary (A) and pharmacy (P) records within clusters.



Clusters: Real and Phantom

Once the anchor record has been assigned to an episode using a diagnosis, the remaining diagnosis codes on the record, if any, are examined. If a remaining diagnosis would more appropriately belong to a different episode than the episode the anchor record is assigned to, the software starts a phantom cluster for a new episode. At this point, phantom clusters are episodes created that will not have any costs assigned to them. Subsequent service records for a patient will now have available additional episodes for potential grouping, so the software will be able to assign these subsequent services more accurately than it would without using phantoms. This allows the diagnostic information to be utilized fully to identify and track all of the conditions for which the member is being treated, yet still assign records to only one episode. The diagram below provides an illustration. The dotted line indicates a phantom episode was started, a straight line indicates a real episode was started. In the case of diagnosis code 719.76, it joined episode #2 which originated as a phantom episode, thereby converting it to a real episode.

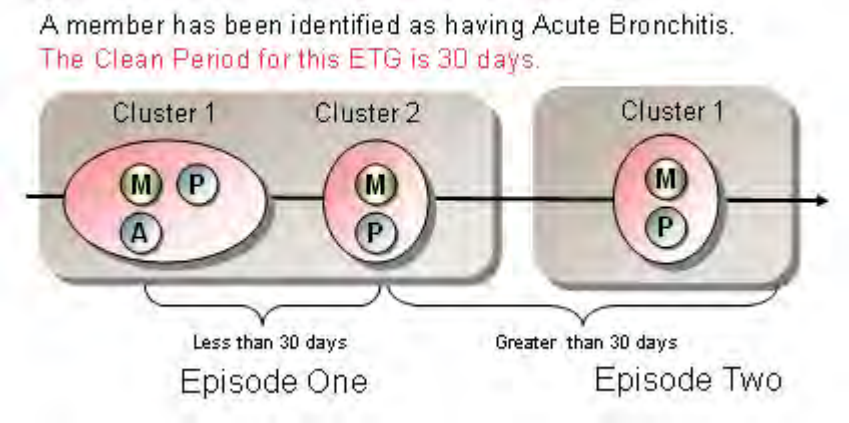


Time Windows: Clean Periods and Member Eligibility

Along with the clinical aspects of starting and grouping records to an episode, the method of episode completion is a crucial feature of ETG. The approach taken for the identification of a complete episode relies on a flexible, rather than a fixed length of time. There are no standard definitions of an episode's chronological length. The episode grouper continues to identify and track all clinical activity for an episode for as long as a condition is actively treated – a concept described as discrete dynamic clean periods. A clean period is defined as the absence of treatment for a specified period of time. Each ETG has its own unique clean period. For an acute condition the concept of a clean period is of most importance. For example, the clean period for Acute Bronchitis is 30 days. Once an episode has started for this ETG, anchor records clinically consistent for acute bronchitis group to this episode until such time as 30 days passes without any corresponding clinically consistent treatment. For Chronic Bronchitis, the clean period is 180 days, consistent with a more chronic illness. In some obvious instances, e.g. benign hypertension or diabetes, there is no clean period. The condition is basically life-long (chronic) and all clinically consistent treatments group to an episode of benign hypertension for as long as data are available.

The clean period window is dynamic in that each new anchor record that joins an episode moves the clean period window by extending the episode's dates. In this way, as long as a condition is consistently treated such that the date of each successive anchor record is less than or equal to the clean period date for the ETG, the episode can last forever.

The following diagram provides an illustration of this concept for an acute condition.



In this example, two episodes of **Acute Bronchitis** are created.

- Three office visits occurred for the treatment of acute bronchitis (record type M)
- The time frame between the second office visit and the third office visit was greater than 30 days, the clean period of this ETG. Therefore, a second episode was created for this condition

If the example above had been for a chronic condition, such as benign hypertension, all services would be grouped into a single episode since chronic conditions do not necessarily have an end to their clean period. To allow for analysis on chronic conditions, we offer 5 options for users to parse the episode into annual increments:

1. User chooses any month to begin year long episodes
2. Year long episodes will start from the beginning of the grouped data
3. Year long episodes will start from the member's eligible start date
4. Year long episodes will end at the end of the grouped data
5. Year long episodes will end at the member's eligible end date

Step 3: Group Non-Anchor Records

Non-anchor records represent services that are incidental to the direct evaluation, management and treatment of a patient. There are two types of non-anchor records: pharmacy records and ancillary records (such as laboratory tests, x-rays, and the facility component of ambulatory surgery centers services). Each non-anchor record links to only one cluster and eventually becomes part of the episode that the cluster is finally grouped to.

Ancillary records can do the following:

- Join an episode
- Convert a phantom episode into a real episode

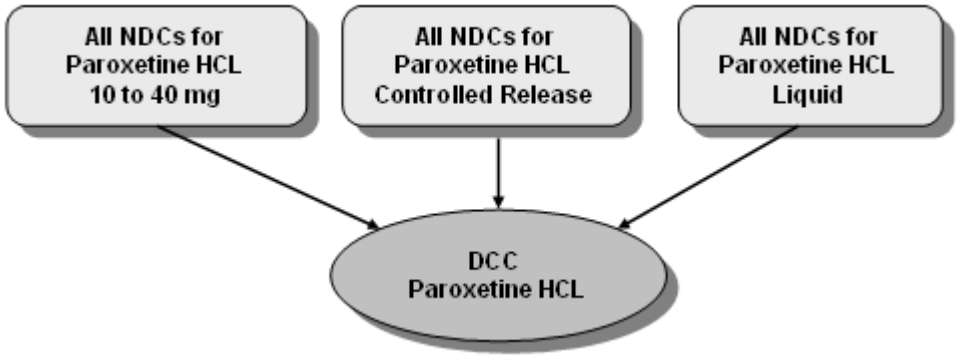
When the grouper assigns an ancillary record to an episode, it uses the ancillary record's diagnosis and procedure/revenue codes. It first evaluates diagnosis codes classified as *specific and nonspecific* to determine if these records can join an episode and then evaluates diagnosis codes classified as *sign and symptoms*. The ancillary record must occur within the clean period time window around an existing episode in order to be eligible to group to an existing episode. An ancillary record cannot extend an episode's length. It can only join an episode.

It is possible for an ancillary claim record to be medically inappropriate for any episode or condition for a member. If an ancillary record is not eligible to join an open episode it is then evaluated to determine if it can be assigned to a preventive ETG (screening and immunizations). If an ancillary record cannot be

assigned to a valid ETG or a preventive ETG, it is identified as an orphan record. An example of this would be when a provider calls in a prescription for the patient rather than seeing the patient in his/her office. The pharmacy claim would not have an anchor record to group to, so it would be considered an orphan.

For drug records, the methodology evaluates each pharmacy record against the episodes for which the patient is being treated. The NDC code assigned to the pharmacy record provides the clinical information to support this evaluation. Just as with the procedure and diagnosis codes, a drug eligibility table identifies ETGs to which an NDC can be associated and the strength of that association (low, medium, high), allowing the grouper to assign the drug claim record to the most clinically appropriate episode. HCPCS Level II procedure codes which represent a drug and its administration (e.g., injectables) are also considered to be pharmacy records, and are grouped in the same way. Due to the large number of NDCs defined for pharmacy services, the ETG methodology uses a drug classification hierarchy to support grouping. Each drug is associated with a Drug Classification Code (DCC) which represents a drug, or a specific dosage form of a drug. For example, the NDCs for all strengths of the antidepressant Paroxetine maps to the DCC of Paroxetine. The DCC concept assigned to the pharmacy services then supports grouping, not the NDC.

The following diagram illustrates this drug hierarchy.



Like ancillary records, drug records cannot extend an episode's length; they can only join an episode. A drug record must occur within an episode's clean period (pre and post) in order to be eligible to group to it.

Step 4: Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

After all claim records have grouped to an episode, the grouper then has all of the information it needs to finalize the episode.

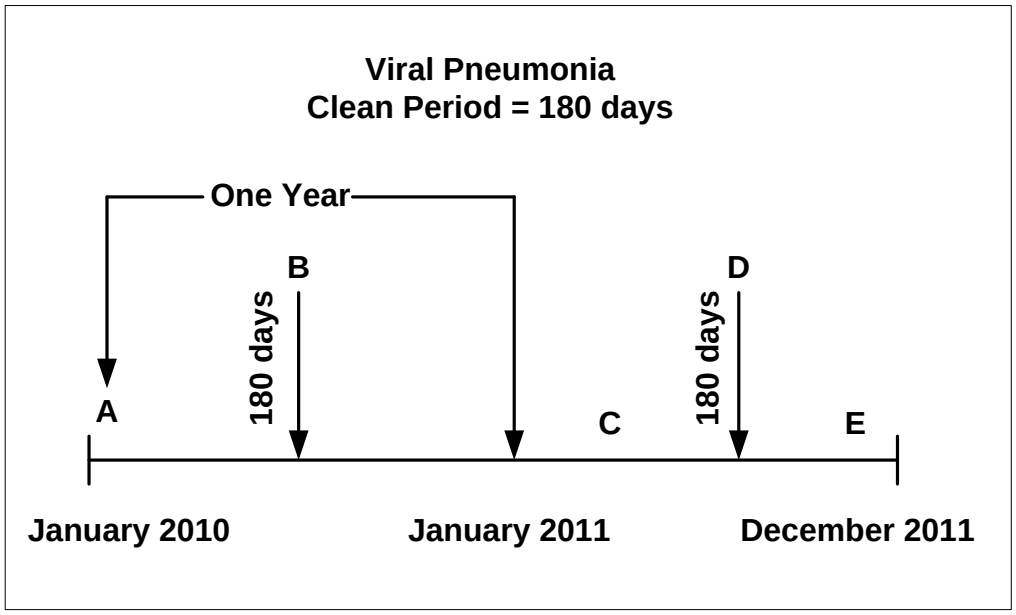
Episode Completeness

The notion of a complete episode is complex in the reality of service data. For example, assume the grouping start date is January 1, 2010. Does an episode for an acute condition with its first anchor record on January 3, 2010 begin with this claim or is the episode in progress? The episode of the acute condition might have begun sometime earlier (prior to January 1, 2010) but the data to identify the exact begin date are not available. The opposite is also true. With data available from January 1, 2009 through December 31, 2010, can it be known if a record incurred on December 21st for an existing episode is the end of the episode? The answer to both questions is that under certain circumstances it cannot be known whether a claim service record is actually the true beginning or the true end of an episode. A distinction must be

made between episodes which are to be considered complete from those whose completeness cannot be determined.

A clean start is defined as a situation where the true beginning date for an episode is known. The ETG methodology identifies a clean start by comparing the incurred date of the first anchor record of an episode with the beginning date of the overall service data range used in the grouping (or a member's beginning eligibility date, if later), with the episode's ETG clean period. If that anchor record date starts after the number of pre-episode clean period days, the episode is considered to have a clean start. If it occurs within the clean period days, it is considered to have an unknown start. The same methodology is true for a clean finish. A clean finish uses the same number of clean period days to determine a known finish. If the last anchor record occurs prior to the clean period days, the episode is determined to have a clean finish. If the last anchor record occurs within the clean period days, it has an unknown finish.

The following diagram illustrates this concept. In this example, anchor records for this episode occur at dates A, B, C, D and E. Note that treatment for this episode spans well over one year.



Assume that the time frame from each anchor record to the next is less than 180 days.

• The anchor record at date A is an unknown start.

• The anchor records at dates B and C (if either were the first anchor records in this episode) represent a clean start.

• The anchor records at dates D and E (if either were the last anchor records in this episode) represent an unknown finish.

The Episode Type identifies the completeness of an episode. Each acute episode is assessed for its status as a full year episode, and if it has a clean start and/or a clean finish. The episode's start and end dates are compared against the clean period days. From this information, the Episode Type can be determined.

The following table identifies the episode type values and whether they are considered complete or incomplete.

Episode Type	Description	Completeness Status
0	Clean start, clean finish	Complete
1	Clean start, unknown finish (full year)	Complete
2	Unknown start, clean finish (full year)	Complete
3	Unknown start, unknown finish (full year)	Complete
4	Clean start, unknown finish	Incomplete
5	Unknown start, clean finish	Incomplete
6	Unknown start, unknown finish	Incomplete
7	Incomplete annual episode	Incomplete

To account for chronic conditions, the ETG methodology utilizes different logic than the clean/unknown starts and finishes approach described above. ETG does this since chronic conditions are life-long going

forward. Further, to support proper episode-to-episode comparisons, the grouper limits the length of each episode for a chronic condition to one year. Such episodes which extend beyond one year and are subsequently limited to one year for analytical purposes are referred to as chronic annual episodes. As mentioned above, the grouper provides different configurable options on how to decide the starting point for chronic episodes: start month (a static month), grouping start date, grouping end date, eligibility start date and eligibility end date.

The grouper uses that selection and looks forward or back 365 days, collects all anchor records within that timeframe and assigns them to an episode. It does this in segments of 365 days. It then collects the non-anchor records and assigns them to the appropriate annual episode. To determine, within an annual year, if a chronic annual episode is considered complete, the grouper determines the member's enrollment during that time span: if the member is eligible for the entire year, that episode is considered complete (episode type 0); if not, the episode is considered incomplete (episode type 7).

The start date and end date for chronic annual episodes is based on the configurable selection made and is a full year date span. It does not reflect the date of the first and last anchor records within the episode, as acute episodes do.

Assign Complications/Condition Status, Comorbidities and Treatments to Episodes

The ETG methodology also identifies complication, comorbidity and treatment factors observed for each episode. After core grouping, episodes are evaluated to determine if they have any complicating factors, if there are any comorbidities associated with the episode's condition, and if the activity within the episode contains any treatment indicators. This information is reflected in the ETG number, allowing one to see specific characteristics of each episode. The first 6 digits are the base class, a unique number identifying the ETG; the 7th, 8th and 9th digits are the flags (with "0" indicating the factor was not observed, and "1" indicating it was) for with or without complication, with or without comorbidity and with or without treatments. The following table provides an illustration of the ETG numbers for Diabetes.

Base ETG	ETG Number	ETG Long Description
163000	163000000	Diabetes, w/o complication, w/o comorbidity, w/o surgery
163000	163000001	Diabetes, w/o complication, w/o comorbidity, with surgery
163000	163000010	Diabetes, w/o complication, with comorbidity, w/o surgery
163000	163000011	Diabetes, w/o complication, with comorbidity, with surgery
163000	163000100	Diabetes, with complication, w/o comorbidity, w/o surgery
163000	163000101	Diabetes, with complication, w/o comorbidity, with surgery
163000	163000110	Diabetes, with complication, with comorbidity, w/o surgery
163000	163000111	Diabetes, with complication, with comorbidity, with surgery

Identifying the condition status/complications for an episode provides specificity of the episode's clinical condition, any complications associated with the episode, and the disease progression, when applicable. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as condition status codes. For example, condition statuses for Diabetes include Diabetes Type 1 and Diabetes Type 2. Examples of condition statuses that specify complications of Diabetes are Diabetic Coma and Diabetic Ketoacidosis.

Condition status codes are identified by diagnosis codes on anchor records, are ETG-specific and must occur within an episode in order for the episode to be designated as *with complication*. For example, the diagnosis of diabetic coma would not be a condition status code for an episode of chronic bronchitis. It would, however, be a condition status code for an episode of diabetes. In addition to flagging the ETG as *with complication*, the grouper provides an optional output that lists each condition status that was identified within an episode.

A comorbidity is defined as the presence of more than one disease or health condition in a member at a given time. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as comorbidity codes. For example, the comorbidity *Chronic bronchitis* is a

compilation of the various diagnosis codes designated as such (e.g. Bronchiectasis, Chronic bronchitis NOS, etc.). The grouper identifies comorbidities by evaluating diagnosis codes on the records designated as anchor records. It keeps track of all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as *with comorbidity*.

Comorbidities are ETG-specific. For example, the comorbidity of Chronic Bronchitis would not be a comorbidity for an episode of Lymphoma. It would, however, be a comorbidity for an episode of Congestive Heart Failure. Any comorbidity that has an active period that occurs during an eligible episode's time frame is considered a comorbidity for that episode.

Treatment indicators are categorizations of services such as defining surgeries and active management procedures for malignant neoplasms (chemotherapy and radiation therapy services). These categories are a grouping of similar procedures. For example, the treatment indicator for Chemotherapy is a compilation of the procedure codes and revenue codes that are classified as chemotherapy services.

When flagging the ETG as *with or without surgery*, the ETG methodology provides more specificity for certain conditions. For malignant neoplasms, the grouper will also designate if an episode incurred active management services. For cardiology conditions, the grouper will also designate if an episode incurred these specific defining surgeries: angioplasty, CABG and valve surgery. The exact nature of the treatment will be specified by the value of the treatment indicator digit. The procedure and/or revenue codes categorized as a treatment indicator must occur within an episode in order for the episode to be flagged as such.

Given the ETG numbering scheme, where the first six digits define the base condition and the remaining digits describe treatment and other clinical factors, users of the ETG outputs have flexibility in how the grouped results are applied. For example, if the desire is to measure at the condition level, episodes are combined for analysis using the first six digits of the ETG number (the first six digits identify the base ETG). If the combination of condition and the presence (or not) of a significant surgery are desired to support comparisons, users would combine episodes using the first six digits and the ninth digit of the ETG number. As described below, severity levels can also be used in addition to support comparisons.

Severity Adjusting Episodes

Complications, comorbidities and member demographics are used in determining the severity of the member's episode. The ETG methodology takes advantage of the relevant complication and comorbidity factors (indicating a sicker member who may require more extensive treatment for a related condition) when determining an episode's severity. The result is a severity score and severity level for episodes. The higher the severity score, the more resources are expected relative to episodes with a lower severity score for the same base ETG.

After condition statuses and comorbidities have been assigned to an episode, the grouper can determine the severity score and severity level for each episode. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for each base ETG where severity is measured. There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights for many conditions.

Based on the severity score, the severity level indicates a ranking of where the specific episode is relative to the population of all episodes within that base ETG. There are four potential severity levels, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. Not all ETGs are severity adjusted and not all ETGs have 4 severity levels. All episodes for ETGs that are not severity adjusted have a severity score of 1.00 and a severity level of 1.

Outlier Status

Outlier status is the comparison of an episode's costs to a dollar amount specified for each ETG. An episode is considered a low outlier if its costs are below the ETG-specific low outlier amount; an episode is considered a high outlier if its costs are above the ETG-specific high outlier amount. The ETG Base Class in combination with the episode's severity level is used to determine the outlier status. All costs within the episode are evaluated (i.e., all record types).

II. ETG Construction Logic for CAD Episodes of Care

Episodes for the submitted CAD measures are defined using the Episode Treatment Group (ETG) methodology. Section I of this document describes the general approach used by ETG to create episodes of care. This section applies that general methodology to create CAD episodes. Also, please note that this description will reference a number of attachments included with the submission for these measures, including:

- S5_CAD_DataDictionary (Excel workbook attachment). This attachment describes the clinical relationships between diagnosis and procedure codes and the episode condition.
- S8_CAD_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of CAD methodologies that relate to comorbidities, condition status factors, and severity adjustment.

The individual Worksheets in these attachments that relate to the specific components of the methodology are referenced in the following discussion.

As noted above, the ETG episode building process has four important steps:

1. Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
2. Build Episodes from Anchor Records
3. Group Non-Anchor Records to Episodes
4. Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

In this section we discuss how these steps apply specifically to creating CAD episodes.

Step 1 (CAD) - Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures

Record Type Assignment

Each service record, or claim line, is assigned a record type. Assigning Record Type uses a combination of the procedure code and the provider type on the claim. As described in Section I, there are 5 record types used by ETG:

- Management Records (for example, an office visit or consultation)
- Surgery Records (for example, a surgical procedure)
- Ancillary Records (for example, a lab test or imaging service)
- Facility Records (room and board)
- Pharmacy

Anchor Record Assignment

Anchor Records are also identified as part of this step. Anchor records play an important role in building CAD episodes. Anchor records have a record type of Management, Surgery, or Facility. An anchor record indicates that a clinician has evaluated the patient and has initiated the treatment and care of the patient for the condition.

Classify Diagnosis Codes

As described in Section I of this document, ETG relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an

ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes applied across all episodes, including ETG:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG. ICD-9 Diagnosis code 414.2 (chronic total occlusion of coronary artery) is an example of a specific diagnosis code. It is primary to, and only eligible for, an episode of CAD.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG. ICD-9 Diagnosis code 429.2 (Unspecified cardiovascular disease) is an example of a non-specific ICD-9 code. Although this code represents disease as opposed to signs or symptoms of disease, it is not specific as to representing a single disease. This code is assigned a lower specificity—Non-specific.
- Signs and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition. ICD-9 Diagnosis code 786.5 (Chest Pain) does not represent diseases, but only signs and symptoms that could be related to multiple diseases. These codes are assigned the lowest specificity— Signs and Symptoms. Signs and Symptoms codes may be eligible for many ETGs due to their generic nature.

The ETG methodology considers one member at a time. The service records and their diagnosis codes are grouped in several distinct passes for a member. The methodology first processes the specific and non-specific diagnosis codes on anchor records so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to. Using this approach, the logic described below that links service records to CAD episodes is applied.

Each diagnosis code is matched with one or more ETGs through a diagnosis eligibility table, including codes that match to the ETG for CAD. Each diagnosis code is further ranked, based on its strength of association with the CAD ETG and other ETGs. The rank values are:

- Primary Classification Ranking diagnoses: A primary ranking classification for a diagnosis describes a condition that defines CAD. These are the main diagnosis codes that impact grouping decisions for CAD. The Diagnosis codes that are classified as primary to CAD are listed on the “PrimaryDxCodes” worksheet within the attachment “S5_CAD_DataDictionary”.
- Incidental Classification Ranking diagnoses: Incidental diagnosis codes are eligible for CAD, but not classified as primary. Incidental diagnoses are further ranked as low, medium, and high, representing the strength of the match association with CAD. The Diagnosis codes that are incidental to CAD are listed on the “IncidentalDxCodes” worksheet within the attachment “S5_CAD_DataDictionary”. The column “diagnosisEligibilityType” in the worksheet describes the ranking where 3 represents a high association, 2 represents a medium association and 1 represents a low association.

Classify Procedure Codes

Procedure codes are also matched to CAD. All procedure codes that are eligible for CAD are listed on the “ProcedureCodes” worksheet within attachment “S5_CAD_DataDictionary”. In some instances a procedure code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the procedure code has eligibility, the ETG methodology uses strength of the clinical relationship between the procedure code and the episode. The CPT and HCPCS procedure codes on this worksheet are ranked from 1 to 4 to specify the strength of the clinical relationship between the procedure code and CAD. The column “ProcedureRank” in the worksheet describes that strength of association, with 4 being the strongest association and 1 being the lowest. The grouping of services based on diagnosis and procedure codes is further described below.

Step 2 (CAD) - Build Episodes from Anchor Records.

Given these clinical relationships described in Step 1, the following steps are further used to build episodes from anchor records:

a. Anchor records are grouped in two passes through the member's data. The first pass groups the anchor records with specific and non-specific diagnoses. The second pass groups anchor records with sign and symptoms diagnoses.

b. All anchor records are grouped before all non-anchor records. Non-anchor records have a record type of Ancillary or Pharmacy.

c. An episode of CAD requires an anchor record to start an episode. For an anchor record to start an episode of CAD, it must have a procedure code that is eligible for CAD and an ICD-9 diagnosis code that is primary for CAD. As an example of an anchor record that starts an episode of CAD, a cardiologist sees a member and submits a claim record using the CPT procedure code 99212 (Office visit, established patient) with and ICD-9 diagnosis code 414.2 (chronic total occlusion of coronary artery).

   Note that a single anchor record can start more than one episode. For example, an anchor record with a diagnosis and procedure code combination that is eligible for CAD will start a CAD episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it will also start a Hypertension episode. (See Section I above for a discussion of the concept of phantom episode clusters.)

d. Once an episode of CAD is started, further anchor records can group to that episode. For a record to be eligible to join an already open episode of CAD the procedure code for the record must be eligible for CAD and the diagnosis code must have either a primary or incidental relationship to CAD.

e. In some cases, an anchor record can be eligible to join more than one episode (because it may have more than one diagnosis code). When determining the episode an anchor record groups to, the specificity of the diagnoses determines the priority for grouping the record. For CAD, a specific code (like 414.2 (chronic total occlusion of coronary artery)) has priority over a non-specific code (like 429.2 Unspecified cardiovascular disease)

f. As described above, diagnosis codes with specificity of sign and symptom have the lowest priority for grouping. An example of a sign and symptom code is 786.5 (Chest Pain) . Anchor records with only sign and symptom diagnosis codes are not grouped until anchor records with more specific disease diagnosis codes are grouped. For example, an office visit record on Jan 15th with an ICD-9 code of 786.5 (Chest Pain) is followed by an office visit record on Feb 1st with an ICD-9 code of 414.2 (chronic total occlusion of coronary artery). The grouper would skip the anchor record service on Jan 15th because it only had a sign and symptom diagnosis code. It would then open up an episode of CAD based on the claim on Feb 1st. On the second pass, the grouper would use the incidental relationship between the sign and symptom ICD-9 code 786.5 to group this claim to the already open CAD episode. Without this methodology, the claim on Jan 15th would not group to the CAD episode on the first pass because at the time of the first pass evaluating the claim on Jan 15th, the CAD episode did not exist.

g. Following these steps, anchor records have been used to open episodes of CAD, as well as episodes for other conditions and anchor records have been assigned uniquely to individual episodes based on the clinical logic described above and in the attachment "S5_CAD_DataDictionary".

Step 3 (CAD). Group Non-Anchor Records to Episodes.

Non-anchor records (record type "Ancillary" and "Pharmacy") can not open episodes on their own. For example, a service record with a procedure code of 0068T (Acoustic heart sound recording and computer analysis; with interpretation and report) and an ICD-9 code of 414.2 (chronic total occlusion of coronary artery) can group to an open episode of CAD but can not open the episode itself.

Ancillary service records group to CAD based on a match of diagnosis and procedure code to CAD. As described above, attachment S5_CAD_DataDictionary includes the diagnosis and procedure mappings for CAD that inform these assignments.

In some instances an Ancillary procedure code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the procedure code has eligibility, the ETG methodology uses strength of the clinical relationship between the procedure code and the episode. The column "ProcedureRank" in the "ProcedureCodes" worksheet within attachment "S5_CAD_DataDictionary" describes that strength of association with 4 being the strongest association and 1 being the lowest.

Pharmacy services group differently because they usually do not have ICD-9 diagnosis codes associated with them. Pharmacy claims group by using a table that maps NDC to the ETG DCC code (Drug Category Code) based on the drug's active ingredients and route of administration. Selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC (e.g., J-codes describing injections). For example, a service with an NDC code 00469462030 (Nitroglycerin 5 mg/ml vial) will map to DCC 24104. The DCC 24104 has a relationship with CAD as defined by the "Pharmacy" worksheet in the attachment "S5_CAD_DataDictionary". Therefore this claim could join an open episode of CAD. It could not, however, start an episode of CAD on its own.

In some instances a DCC code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the DCC code has eligibility, the ETG methodology uses strength of the clinical relationship between the DCC code and the episode. The column "Rank" in the "Pharmacy" worksheet within attachment "S5_CAD_DataDictionary" describes that strength of association. The lower the value is for Rank, the stronger the association between the DCC and the episode.

Due to the size of the attachment the full list of NDC to DCC mappings has not been provided within this submission. This file is available upon request.

Step 4 (CAD): Finalize the Episodes (Identify Comorbidities and Complicating Factors, and Assign Episode Severity)

Episode Completeness

Episode completeness, the assignment of comorbidities and condition status, and the measurement of episode severity are the key steps in finalizing a CAD episode.

In terms of episode completeness, CAD is a life-long, chronic condition. Therefore the clean periods described in Section I as part of the general ETG methodology are not applicable. All clinically consistent treatments for the care of a CAD patient will group to the episode of CAD for as long as data are available. To support proper episode comparisons, it is recommended that these longer CAD episodes be divided into annual increments.

Assigning Comorbidities and Condition Status Factors to CAD Episodes

The ETG methodology identifies the comorbidities and condition status factors observed for each CAD episode. These factors provide specificity of the episode's clinical condition and also play a key role in assigning a severity score and level to the episode. An example of the assignment of comorbidities and condition status factors and creation of a severity score and level is provided at the end of step 4 and references to this example are provided in the following text.

Condition status factors for CAD episodes are identified by diagnosis codes on anchor records that occur within the CAD episode. The "ConditionStatustoDxCodeMap" Worksheet in the attachment "S8_CAD_ClinicalLogic" describes the mapping of diagnosis codes to condition status factors. In particular, the following condition status factors are defined for CAD:

- Acute Myocardial Infarction
- Subendocardial Infarction

Only one of these condition status factors can apply to an episode of CAD. If both happen to be present

in the claims, Acute Myocardial Infarction would take precedence over Subendocardial Infarction.

Comorbidity factors for CAD episodes are identified by evaluating diagnosis codes on the records designated as anchor records from outside the CAD episode. ETG tracks all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as with comorbidity. The comorbidity groups defined by ETG for CAD are described in the "ComorbtoDxCodeMap" Worksheet in the attachment "S8_CAD_ClinicalLogic", including the individual diagnosis codes that map to each. Examples of these comorbidity groups include Diabetes, Chronic Heart Failure and Chronic Bronchitis. In the example included below, the comorbidities 80174 (congestive heart failure) and 80290 (other pulmonary disorders) is assigned to the CAD episode based upon the diagnosis information on anchor records that occur outside of the CAD episode.

Assigning Severity to CAD Episodes

Condition status factors, comorbidities and patient demographics are used in determining the severity of the CAD episode. The ETG methodology takes advantage of the relevant condition status and comorbidity factors when determining an episode's severity. In general, these factors indicate a higher risk patient who may require more extensive treatment for CAD. The result is a severity score and severity level for each episode. The higher the severity score, the more resources are expected relative to other CAD episodes.

The condition status and comorbidity factors found to have an impact on the required resources for CAD episodes are included in the severity model. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for the base ETG of CAD. There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights.

The following worksheets in the attachment "S8_CAD_ClinicalLogic" describe the factors and weightings used in determining the level of severity for a CAD episode (see the notes at the top of each worksheet for a further description of the comorbidity or condition status concept):

- Worksheet "Comorbidities" – includes the ComorbidityCodes and Comorbidity Groups used to determine severity for CAD. The rightmost columns include a "Priority" hierarchy along with risk weights for the non-elderly and elderly models. The Priority column is applied where multiple ComorbidityCodes in the same Comorbidity group are identified, with the lowest number priority receiving precedence. Each risk weight reflects the incremental contribution of having a specific Comorbidity factor on CAD severity. (Note that a number of the individual ComorbidityCodes that are clinically similar are combined and used as a group in measuring severity. Only one of these individual Codes is needed to trigger the aggregate Comorbidity Group2, after application of any relevant Priority.);
- Worksheet "ComorbidityInteractions" – includes the interactions between Comorbidity Groups used to determine severity for CAD. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Comorbidity interaction factor on CAD severity;
- Worksheet "ComorbidityCounts" – includes the additional severity factors added for those episodes where 3 or more comorbidity factors were observed. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Comorbidity Count factor on CAD severity;
- Worksheet "ConditionStatuses" – includes the Condition Status factors used to determine severity for CAD. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status factor on CAD severity;

- Worksheet “ConditionStatusInteractions” – includes the interactions between Condition Status factors used to determine severity for CAD. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status interaction factor on CAD severity;
- Worksheet “ConditionStatusCounts” – includes the additional severity factors added for those episodes where 3 or more condition status factors were observed. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific ConditionStatus Count factor on CAD severity;
- Worksheet “Demographics” – includes the additional severity factors added based on age and gender. Each risk weight reflects the incremental contribution of having a specific Demographic factor on CAD severity;

The severity score for a CAD episode is the sum of the weights for each of the factors observed for the episode.

The following example shows the calculation of severity score and level for a CAD episode.
The example describes a Male patient, age 47, observed to have a number of anchor records with a diagnosis that maps to the CAD ETG. The patient is also observed to have one condition status factor and two comorbidities that are also eligible for CAD. The condition status factor 70083 (acute myocardial infarction) was identified through one or more anchor records observed within the episode where the diagnosis on the records mapped to that condition status factor. The comorbidities (80174 congestive heart failure and 80290 other pulmonary disorders) both were identified on one or more anchor records observed outside of the CAD episode.

The patient receives a severity marker for each of the condition status and comorbidity factors and a risk weight is assigned to each. The patient also receives severity weight related to his age and gender which fall into the “Male 45-54” range. Finally, the patient receives additional severity weight due to an interaction term included in the severity model for CAD.

A severity score of 5.1828 is calculated based upon the sum of:

- The Demographic weight of 0.6377 (see worksheet “Demographics” within S8_CAD_ClinicalLogic where column “gender”=M and column “ageRange”=45-54);
- The condition status weight for acute myocardial infarction of 2.7223 (see worksheet “ConditionStatuses” within S8_CAD_ClinicalLogic where column “conditionStatusCode”=70083),
- The comorbidity weight for Congestive Heart Failure of 0.5666 (see worksheet “Comorbidities” within S8_CAD_ClinicalLogic where column “comorbiditycode”=80174. The CHF comorbidity belongs to the Comorbiditygroup2 of Heart Disease 2.);
- The comorbidity weight for Other Pulmonary Disorders of 0.8383 (see worksheet “Comorbidities” within S8_CAD_ClinicalLogic where column “comorbiditycode”=80290. Other Pulmonary Disorders belongs to the comorbidity group of Serious Pulmonary Disease 1.).
- The interaction weight of 0.4179 for the interaction of the Congestive Heart Failure and Other Pulmonary Disorders comorbidity groups. (Using the worksheet “ComorbidityInteractions” within S8_CAD_ClinicalLogic the interaction of these two comorbidity groups results in an adjustment of the severity score by 0.4179 (where column “FirstComorbidityGroup2”=Heart Disease 2 “SecondComorbidityGroup2”=Other Pulmonary Disorders).
- The final severity score, including the comorbidity interaction adjustment is calculated as 0.6377 + 2.7223 + 0.5666 + 0.8383 + 0.4179 = 5.1828

Based on the severity score, the severity “level” indicates a categorical ranking of where the specific episode is relative to the population of all CAD episodes. There are four potential severity levels for CAD, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. The “Thresholds” Worksheet in attachment “S8_CAD_ClinicalLogic” describe the three cut-off points that define the four levels of severity for CAD episodes.

The following example shows the calculation of severity score and level for a CAD episode.

Episode	ETG(Base Condition)	Complications			
1	Ischemic heart disease	70083			
		Comorbidities			
		80174	80290		
		Severity Level			
		1	2	3	4
		< 0.8	0.8 = 1.8	1.8 - 3.4	> 3.4

Calculation of Relative Episode Severity			
Indicator	Code	Description	Severity Weight
Demographic	18	M45_54	0.6377
Condition Status	70083	Acute myocardial infarction	2.7223
Co-morbidity	80174	Congestive heart failure	0.5666
	80290	Other pulmonary disorders	0.8383
Interaction	80174 + 80290		0.4179
Total			5.1828

Example of Calculating ETG Episode Severity Score and Level.

The ETG methodology for CAD uses medical and pharmacy service records and member enrollment as input. Outputs for CAD include the identification of the individual service records assigned to a CAD episode, along with the details of the grouping, including ETG, episode ID, record type, cluster ID, and cluster provider. An episode summary record is also produced, describing the episode ID, the ETG assigned (CAD), the severity score and severity level for the episode, episode completion status, and other episode-level characteristics.

Note that the episode grouping methodology for CAD is applied in the context of the full-breadth of the ETG clinical methodology, where all clinical conditions and episodes can be considered and created for a member. In this way, decisions regarding the appropriate assignment of a service record to an individual CAD episode can be made while considering all conditions and episodes for that member, including episodes other than CAD.

The episode results can then be used to support episode-based measures of the resources involved in diagnosing, managing and treating CAD as further discussed within the CAD specifications provided in the submission form.

Medical Claim Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

RX Claim Data Elements

NQF Resource Use Measure submission
For question S6 - Answer: Ingenix Data Protocol
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, C

Data Element Name	Field Type	Maximum Length
Member ID	alphanum	32
Date of Service	date	10
Payment Date	date	10
NDC Code	alphanum	11
Prescribing Provider ID	alphanum	20
Allowed Amount	numeric	10.2
Requested/Billed Amount	numeric	10.2
Payment Amount	numeric	10.2

CAD, Non-Condition Specific/Population

Data Element Comments

Unique Member Identifier
May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Includes capitation and patient liability amounts
Includes withhold amounts

Member Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, No

Data Element Name	Field Type	Maximum Length
Member ID	alphanum	32
Sex	alphanum	1
Date of Birth	date	10
Effective Date	date	10
End Date	date	10
Member Zip Code	alphanum	10
Member State Code	alphanum	2
Pharmacy Benefit Flag	alphanum	1
PCP ID	alphanum	20
Product/Coverage Code Identifier	alphanum	30

n-Condition Specific/Population

Data Element Comments
Unique Member Identifier
Eligibility Begin Date
Eligibility End Date
Supports geographic-based member analysis. May be omitted if not available or applicable.
Supports geographic-based member analysis. May be omitted if not available or applicable.
Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

Provider Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

The content contained in this document is proprietary and confidenti

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Str

Data Element Name	Field Type	Maximum Length
Provider ID	alphanum	20
Provider Specialty	alphanum	30
PCP Indicator	numeric	1
Provider Zip Code	alphanum	10
Provider State Code	alphanum	2
Provider Affiliation	alphanum	30

al
oke, CAD, Non-Condition Specific/Population

Data Element Comments

Unique Provider Identifier
Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
Indicates whether or not the Provider can serve as a PCP
Supports geographic-based provider analysis. May be omitted if not available or applicable.
Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

Medical Claim Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

RX Claim Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
Payment Date	date	10	
NDC Code	alphanum	11	
Prescribing Provider ID	alphanum	20	May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

Member Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Sex	alphanum	1	
Date of Birth	date	10	
Effective Date	date	10	Eligibility Begin Date
End Date	date	10	Eligibility End Date
Member Zip Code	alphanum	10	Supports geographic-based member analysis. May be omitted if not available or applicable.
Member State Code	alphanum	2	Supports geographic-based member analysis. May be omitted if not available or applicable.
Pharmacy Benefit Flag	alphanum	1	
PCP ID	alphanum	20	Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Product/Coverage Code Identifier	alphanum	30	Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

Provider Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
PCP Indicator	numeric	1	Indicates whether or not the Provider can serve as a PCP
Provider Zip Code	alphanum	10	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider State Code	alphanum	2	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider Affiliation	alphanum	30	Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

NQF Resource Use Measure submission
For question S10 - Answer: Ingenix Risk Adjustment Method Example
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Cardiology, Medical Group A			
Condition and Severity Level	**Number of Episodes**	**Observed Cost per Episode**	**Peers Cost per Episode**
Dr Jones	**By Condition and Severity Level**		
CHF, Level 1	20	$1,116	$1,320
CHF, Level 2	16	$1,775	$2,234
CHF, Level 3	12	$2,977	$3,145
Dr Smith	**By Condition and Severity Level**		
CHF, Level 1	30	$1,520	$1,320
CHF, Level 3	12	$3,349	$3,145
Dr Jones	**By Condition**		
CHF	48	1,801	2,081
Dr Smith	**By Condition**		
CHF	42	2,043	1,841

Relative Cost of Care Ratio
0.85
0.79
0.95
1.15
1.06
0.87
1.11

Reliability Across HCOs

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: CAD

	ETG Base 386500 - CAD									
	Data Source									
Cardiology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	1,545	3,533	7,032	7,638	26,305	325	3,280	2,208	1,280	53,146
Cost per Episode	$ 3,035	$ 4,096	$ 3,874	$ 2,613	$ 4,242	$ 4,412	$ 4,726	$ 3,840	$ 6,813	$ 3,991
Primary Care Core Cost per Episode	$ 54	$ 82	$ 76	$ 73	$ 72	$ 117	$ 89	$ 70	$ 94	$ 75
Specialist Cost per Episode	$ 1,014	$ 879	$ 2,270	$ 700	$ 847	$ 818	$ 728	$ 699	$ 999	$ 1,011
ER Cost per Episode	$ 63	$ 50	$ 57	$ 33	$ 59	$ 48	$ 56	$ 43	$ 109	$ 55
Radiology Cost per Episode	$ 252	$ 267	$ 209	$ 191	$ 183	$ 384	$ 174	$ 279	$ 345	$ 204
RX Cost per Episode	$ 617	$ 788	$ 520	$ 610	$ 683	$ 745	$ 648	$ 480	$ 773	$ 648
Lab Cost per Episode	$ 60	$ 69	$ 158	$ 35	$ 19	$ 60	$ 35	$ 74	$ 122	$ 50
Hospital Cost per Episode	$ 976	$ 1,961	$ 585	$ 972	$ 2,379	$ 2,241	$ 2,996	$ 2,194	$ 4,372	$ 1,948

	ETG Base 386500 - CAD									
	Data Source									
Cardiology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	1,545	3,533	7,032	7,638	26,305	325	3,280	2,208	1,280	53,146
Specialist Visits per 1000 Episodes	3,066	2,902	3,162	2,846	3,633	2,731	3,751	2,385	2,696	3,320
Radiology Encounters per 1000 Episodes	685	535	480	551	586	452	725	621	545	575
Lab Encounters per 1000 Episodes	1,366	1,163	2,115	1,652	395	1,400	1,872	1,842	1,510	1,067
MRI Encounters per 1000 Episodes	6	3	1	2	5	39	2	3	4	4
ER Visits per 1000 Episodes	77	50	99	45	75	22	98	57	65	73
Inpatient Days per 1000 Episodes	212	266	54	205	419	228	691	414	263	335
Admissions per 1000 Episodes	69	98	19	63	142	101	231	194	120	116

	ETG Base 386500 - CAD									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	2,093	1,162	5,176	8,155	10,386	1,362	3,554	6,621	544	39,054
Cost per Episode	$ 2,158	$ 5,026	$ 4,957	$ 3,606	$ 4,234	$ 6,978	$ 3,738	$ 2,683	$ 2,423	$ 3,873
Primary Care Core Cost per Episode	$ 186	$ 102	$ 115	$ 103	$ 111	$ 207	$ 107	$ 174	$ 210	$ 129
Specialist Cost per Episode	$ 546	$ 874	$ 2,872	$ 792	$ 788	$ 1,038	$ 573	$ 448	$ 347	$ 980

ER Cost per Episode	$ 42	$ 99	$ 102	$ 70	$ 95	$ 222	$ 72	$ 42	$ 55	$ 81
Radiology Cost per Episode	$ 152	$ 239	$ 234	$ 154	$ 147	$ 309	$ 133	$ 194	$ 301	$ 177
RX Cost per Episode	$ 590	$ 758	$ 472	$ 624	$ 628	$ 695	$ 620	$ 455	$ 658	$ 581
Lab Cost per Episode	$ 31	$ 66	$ 213	$ 33	$ 19	$ 67	$ 34	$ 71	$ 63	$ 62
Hospital Cost per Episode	$ 611	$ 2,887	$ 950	$ 1,830	$ 2,445	$ 4,440	$ 2,199	$ 1,299	$ 788	$ 1,863

	ETG Base 386500 - CAD									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	2,093	1,162	5,176	8,155	10,386	1,362	3,554	6,621	544	39,054
Specialist Visits per 1000 Episodes	2,964	3,035	3,625	3,667	3,689	2,884	3,936	2,245	2,380	3,349
Radiology Encounters per 1000 Episodes	567	575	628	702	600	581	772	503	376	618
Lab Encounters per 1000 Episodes	1,074	1,303	2,084	1,779	419	1,671	2,103	2,095	1,416	1,480
MRI Encounters per 1000 Episodes	1	4	2	2	5	26	3	1	6	4
ER Visits per 1000 Episodes	58	85	187	99	118	126	141	91	73	116
Inpatient Days per 1000 Episodes	161	508	179	743	593	440	869	532	42	545
Admissions per 1000 Episodes	55	145	42	152	165	178	224	127	24	137

	ETG Base 386500 - CAD									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	3,054	2,925	5,021	11,499	38,992	639	2,782	8,067	1,794	74,773
Cost per Episode	$ 2,568	$ 4,465	$ 4,872	$ 3,400	$ 4,048	$ 6,930	$ 4,062	$ 3,250	$ 5,862	$ 3,942
Primary Care Core Cost per Episode	$ 189	$ 128	$ 105	$ 122	$ 142	$ 246	$ 139	$ 148	$ 130	$ 139
Specialist Cost per Episode	$ 667	$ 874	$ 2,873	$ 749	$ 748	$ 1,123	$ 608	$ 465	$ 814	$ 862
ER Cost per Episode	$ 49	$ 87	$ 106	$ 70	$ 67	$ 220	$ 80	$ 57	$ 94	$ 71
Radiology Cost per Episode	$ 190	$ 230	$ 232	$ 143	$ 140	$ 340	$ 144	$ 178	$ 341	$ 163
RX Cost per Episode	$ 600	$ 720	$ 503	$ 657	$ 645	$ 693	$ 605	$ 401	$ 734	$ 613
Lab Cost per Episode	$ 35	$ 66	$ 257	$ 36	$ 15	$ 88	$ 35	$ 79	$ 110	$ 48
Hospital Cost per Episode	$ 839	$ 2,360	$ 795	$ 1,622	$ 2,291	$ 4,219	$ 2,451	$ 1,922	$ 3,638	$ 2,046

	ETG Base 386500 - CAD									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	3,054	2,925	5,021	11,499	38,992	639	2,782	8,067	1,794	74,773
Specialist Visits per 1000 Episodes	3,412	3,139	4,066	3,771	3,940	3,500	4,304	2,304	2,587	3,670
Radiology Encounters per 1000 Episodes	688	594	642	667	611	678	839	603	519	630

Lab Encounters per 1000 Episodes	1,120	1,248	2,397	1,917	436	1,979	2,056	2,287	1,479	1,153
MRI Encounters per 1000 Episodes	2	5	2	2	4	20	1	2	4	3
ER Visits per 1000 Episodes	68	94	183	101	98	114	166	93	63	104
Inpatient Days per 1000 Episodes	241	390	190	687	692	529	1,097	751	230	636
Admissions per 1000 Episodes	74	127	45	142	162	183	228	280	103	160

Results Across Peer Groups, Cost

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: CAD

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Cardiology Peer Definition					
# of Episodes	31,546	17,241	2,771	1,589	53,146
Total Cost per Episode	$ 2,630	$ 4,012	$ 10,617	$ 19,237	$ 3,991
Primary Care Core Cost per Episode	$ 62	$ 84	$ 117	$ 148	$ 75
Specialty Care Cost per Episode	$ 697	$ 1,051	$ 2,520	$ 4,198	$ 1,011
ER Cost per Episode	$ 36	$ 54	$ 166	$ 238	$ 55
Radiology Cost per Episode	$ 197	$ 209	$ 221	$ 256	$ 204
Pharmacy Cost per Episode	$ 600	$ 687	$ 853	$ 823	$ 648
Laboratory Cost per Episode	$ 36	$ 53	$ 118	$ 184	$ 50
Hospital Services Cost per Episode	$ 1,002	$ 1,874	$ 6,621	$ 13,390	$ 1,948

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	21,704	13,372	2,478	1,501	39,054
Total Cost per Episode	$ 2,288	$ 3,510	$ 9,938	$ 20,036	$ 3,873
Primary Care Core Cost per Episode	$ 109	$ 138	$ 191	$ 230	$ 129
Specialty Care Cost per Episode	$ 557	$ 906	$ 2,661	$ 4,982	$ 980
ER Cost per Episode	$ 54	$ 77	$ 192	$ 326	$ 81
Radiology Cost per Episode	$ 166	$ 184	$ 200	$ 247	$ 177
Pharmacy Cost per Episode	$ 523	$ 620	$ 736	$ 818	$ 581
Laboratory Cost per Episode	$ 39	$ 60	$ 149	$ 265	$ 62
Hospital Services Cost per Episode	$ 840	$ 1,524	$ 5,809	$ 13,170	$ 1,863

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Internal Medicine Peer Definition					
# of Episodes	42,658	24,784	4,691	2,641	74,773
Total Cost per Episode	$ 2,276	$ 3,785	$ 10,533	$ 20,635	$ 3,942
Primary Care Core Cost per Episode	$ 119	$ 151	$ 198	$ 241	$ 139
Specialty Care Cost per Episode	$ 498	$ 884	$ 2,214	$ 4,134	$ 862
ER Cost per Episode	$ 48	$ 73	$ 157	$ 287	$ 71
Radiology Cost per Episode	$ 148	$ 173	$ 201	$ 235	$ 163
Pharmacy Cost per Episode	$ 553	$ 659	$ 787	$ 839	$ 613
Laboratory Cost per Episode	$ 31	$ 49	$ 111	$ 194	$ 48
Hospital Services Cost per Episode	$ 879	$ 1,795	$ 6,864	$ 14,705	$ 2,046

Results Across Peer Groups, Utils

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: CAD

	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Cardiology Peer Definition					
# of Episodes	31,546	17,241	2,771	1,589	53,146
Specialist Visits per 1000 Episodes	2,592	3,582	6,476	9,421	3,320
Radiology Encounters per 1000 Episodes	464	612	1,048	1,544	575
Laboratory Encounters per 1000 Episodes	831	1,338	1,674	1,760	1,067
MRI Encounters per 1000 Episodes	4	3	3	10	4
ER Visits per 1000 Episodes	57	80	136	186	73
Admission Days per 1000 Episodes	122	320	1,311	3,031	335
Number of Admissions per 1000 Episodes	63	114	405	704	116
Number of Prescriptions per 1000 Episodes	7,257	8,611	9,300	9,676	7,875
Number of Generic Prescriptions per 1000 Episodes	4,541	5,557	5,825	5,854	4,977
	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	21,704	13,372	2,478	1,501	39,054
Specialist Visits per 1000 Episodes	2,347	3,420	6,812	11,494	3,349
Radiology Encounters per 1000 Episodes	451	633	1,230	1,883	618
Laboratory Encounters per 1000 Episodes	1,094	1,743	2,786	2,566	1,480
MRI Encounters per 1000 Episodes	3	4	3	8	4
ER Visits per 1000 Episodes	89	123	214	291	116
Admission Days per 1000 Episodes	173	533	1,827	3,929	545
Number of Admissions per 1000 Episodes	67	124	429	776	137
Number of Prescriptions per 1000 Episodes	7,082	8,809	9,213	10,244	7,930
Number of Generic Prescriptions per 1000 Episodes	4,606	5,896	6,210	6,508	5,222
	ETG Base=386500 (CAD)				
	Severity				
	1	2	3	4	Total

Internal Medicine Peer Definition					
# of Episodes	42,658	24,784	4,691	2,641	74,773
Specialist Visits per 1000 Episodes	2,497	3,903	7,809	13,082	3,670
Radiology Encounters per 1000 Episodes	433	665	1,377	2,152	630
Laboratory Encounters per 1000 Episodes	848	1,423	2,019	2,008	1,153
MRI Encounters per 1000 Episodes	3	4	4	7	3
ER Visits per 1000 Episodes	77	116	193	276	104
Admission Days per 1000 Episodes	193	577	2,497	5,050	636
Number of Admissions per 1000 Episodes	74	164	507	890	160
Number of Prescriptions per 1000 Episodes	7,001	8,777	9,367	10,199	7,851
Number of Generic Prescriptions per 1000 Episodes	4,502	5,890	6,345	6,646	5,153

Exclusions

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: CAD

	Data Source									
	HCO: A	**HCO: B**	**HCO: C**	**HCO: D**	**HCO: E**	**HCO: F**	**HCO: G**	**HCO: H**	**HCO: J**	**Total**
% Complete Episodes	83.91%	82.15%	77.90%	84.51%	81.85%	82.11%	81.72%	83.15%	81.84%	82.47%
% Incomplete Episodes	16.09%	17.85%	22.10%	15.49%	18.15%	17.89%	18.28%	16.85%	18.16%	17.53%
% Non-Outliers Episodes	89.30%	89.48%	84.52%	88.91%	89.16%	87.13%	77.92%	87.64%	88.64%	87.86%
% Hi Outliers Episodes	2.72%	5.18%	10.33%	2.01%	3.57%	5.65%	2.29%	3.79%	4.31%	4.08%
% Lo Outliers Episodes	7.98%	5.34%	5.14%	9.08%	7.27%	7.22%	19.79%	8.57%	7.05%	8.07%
% Non-Outliers + Hi Outliers Episodes	92.02%	94.66%	94.86%	90.92%	92.73%	92.78%	80.21%	91.43%	92.95%	91.93%
% Episodes Eligible for Attribution	77.19%	77.57%	73.64%	76.84%	75.91%	76.19%	66.24%	76.06%	76.09%	75.81%

Notes:
Data is based on the analysis of 9 Health Care Organizations (HCO) totaling more than 48 million episodes
Episodes are defined as either Complete or Incomplete according to ETG Methodology. See response for SA3.1 for additional details on Episode completion
Episodes are defined as Outliers according to the ETG Trim Point Methodology. See response for SA3.1 for additional details on Outlier Episodes
Episodes Eligible for Attribution represents episodes that are Complete, Non-Outliers or Hi Outliers, applicable for a peer group based upon the episode ETG.

A Physician Profile
Presented by Ingenix Impact Intelligence

Specialty Patterns of Care

For the 12 Months
Ending 12/31/2007

Physician		Number of Episodes:	93
Name:	Provider 6388502012	Case Mix, Episodes:	0.48
		Peer Group	
Primary ID:	6388502012	Peer Group Number of Episodes:	5,430
		Peer Group Name:	II Cardiology
Specialty:	Cardiology	Key Statistics	
		Overall Quality Index:	1.02
		Overall Cost Index, Episodes:	1.14
		Confidence Intervals for the Index	
		Overall Quality Index:	No data available
		Overall Cost Index, Episodes:	No data available

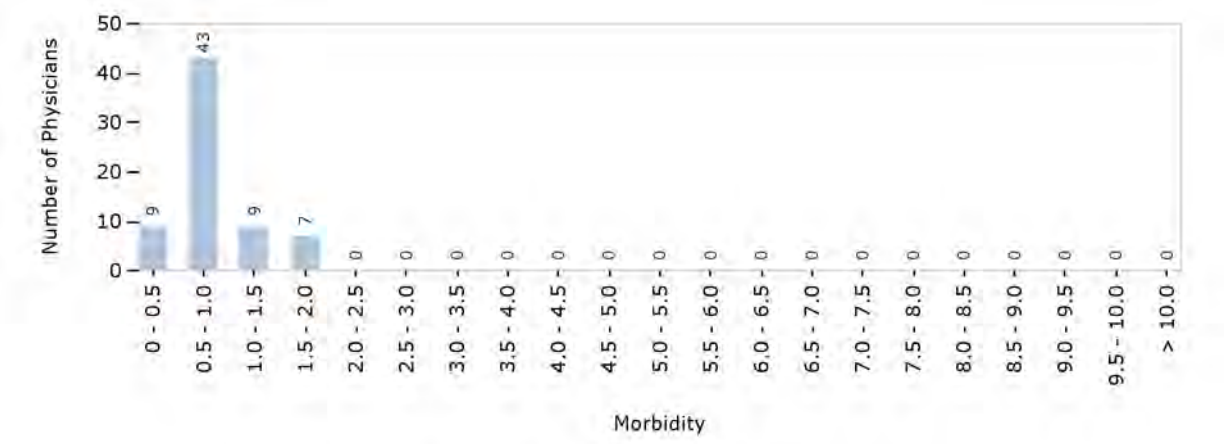
Statistical significance of difference between index and peer group average: * p<0.10; ** p < 0.05

Episode Case Mix Summary

Top 10 ETGs, by Total Cost (Completed Episodes of Care)

	Episodes			Encounters (Per 1000 Episodes)	
ETG Family Description	Episodes	Specialist's Cost / Episode	Peers Cost / Episode	Specialist's Encounters / 1000 Episode	Peers Encounters / 1000 Episode
Hypertension	43	$1,569.36	$1,228.51	14,779	12,844
Hyperlipidemia, other	19	$720.64	$631.67	7,169	6,829
Ischemic heart disease	9	$1,511.63	$2,378.04	12,889	13,765
Valvular disorder	14	$818.25	$1,047.19	4,367	7,315
Cardiomyopathy	3	$2,407.90	$1,340.66	16,583	14,088
Pulmonary embolism	1	$3,244.43	$3,897.41	38,714	24,716
Congestive heart failure	1	$2,817.56	$1,496.61	6,600	14,084
Atherosclerosis	2	$702.92	$387.57	1,500	1,125
Atrial fibrillation & flutter	1	$507.36	$1,715.52	25,500	21,127
All Others	0	--	--	--	--
All Episodes	93	$1,304.04	$1,211.06	11,523	10,879

Relative Morbidity Histogram

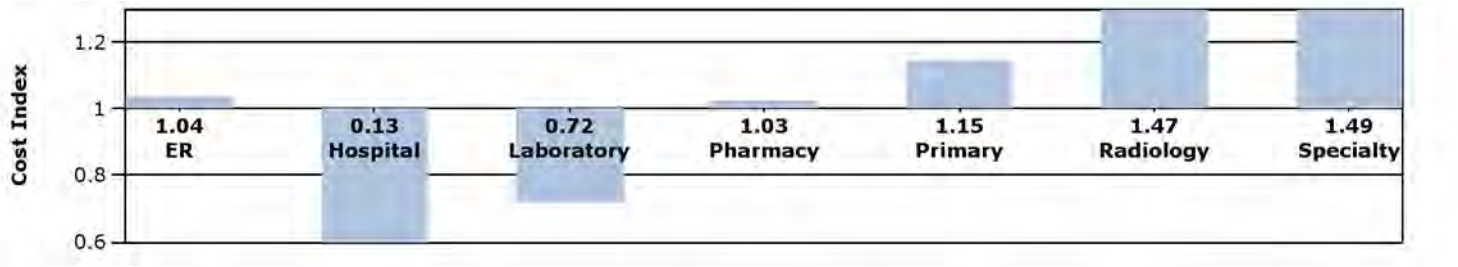

Number of Physicians
50
40
30
20
10
0
9
43
9
7
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 2.5
2.5 - 3.0
3.0 - 3.5
3.5 - 4.0
4.0 - 4.5
4.5 - 5.0
5.0 - 5.5
5.5 - 6.0
6.0 - 6.5
6.5 - 7.0
7.0 - 7.5
7.5 - 8.0
8.0 - 8.5
8.5 - 9.0
9.0 - 9.5
9.5 - 10.0
> 10.0
Morbidity

Quality Measures

As of the End of the Report Period
(Members Must be Continuously Enrolled with Plan a Minimum of 12 Months)

	Number of Quality Opportunities		Rates		Index
	With Compliance	Total	Provider Rate	Peer Rate	Quality Index
Cardiology					
HTN					
Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.	12	15	0.80	0.81	0.99
HTN					
Pt(s) taking an NSAID med.	21	23	0.91	0.92	0.99
HTN					
Pt(s) that had an annual physician visit.	23	23	1.00	0.97	1.03
HTN					
Pt(s) that had a serum creatinine in last 12 rpt mos.	19	23	0.83	0.80	1.03
CAD					
Pt(s) conon 2 meds (nitrate and phosphodiesterase type 5 inhibitor) w/ interacting properties.	6	6	1.00	1.00	1.00
CAD					
Pt(s) that had an OV for CAD care in last 12 rpt mos.	6	6	1.00	0.97	1.03
Endocrinology					
Hyperlipidemia					
Pt(s) taking a statin-containing med, nicotinic acid or fibric acid derivative that had an annual serum ALT or AST test.	10	10	1.00	0.92	1.09
Hyperlipidemia					
Pt(s) w/ a LDL cholesterol test in last 12 rpt mos.	16	16	1.00	0.90	1.12
Hyperlipidemia					
Pt(s) w/ the most recent LDL result <160mg/dL.	4	5	0.80	0.93	0.86
Hyperlipidemia					
Pt(s) w/ a HDL cholesterol test in last 12 rpt mos.	16	16	1.00	0.90	1.11
Hyperlipidemia					
Pt(s) w/ the most recent HDL result >= 40mg/dL.	1	5	0.20	0.68	0.29
Hyperlipidemia					
Pt(s) w/ a triglyceride test in last 12 rpt mos.	16	16	1.00	0.90	1.12
Total	150	164	0.91	0.89	1.03

Cost Index Summary, by Service Category



Cost and Utilization Summary Measures

Profiled Costs

	Actual Encounters	Peers Encounters	Actual Cost / Episode	Peers Cost / Episode	Cost / Episode Index	Actual Total Cost
ER	5	4	$53.98	$52.08	1.04	$5,020
Facility	3	2	$45.42	$45.48		$4,224
Professional	2	2	$8.56	$6.59		$796
Hospital Services	8	17	$29.49	$227.90	0.13	$2,743
Inpatient Facility	0	2	$0.00	$108.97		$0
Outpatient Hospital Surgery	0	2	$0.00	$57.97		$0
Laboratory	40	51	$19.29	$26.93	0.72	$1,794
Facility	0	3	$0.00	$6.96		$0
Professional	40	48	$19.29	$19.97		$1,794
Pharmacy	492	499	$271.71	$264.70	1.03	$25,269
Anti-Infective Agents	4	5	$0.37	$1.51		$35
Cardiovascular agents	359	393	$221.64	$227.13		$20,613
Primary Care Core	119	104	$68.41	$59.66	1.15	$6,362
PCC Diagnostic	57	61	$18.70	$28.57		$1,739
Radiology	34	27	$210.93	$143.69	1.47	$19,617
Facility	1	3	$2.51	$25.55		$234
Professional	34	24	$208.42	$118.14		$19,383
Specialty Care	373	309	$650.24	$436.10	1.49	$60,472
Medical Specialty	354	287	$606.05	$402.22		$56,363
PCP Specialty	1	3	$0.22	$3.31		$21
Surgical Specialty	3	4	$1.38	$4.23		$129
Total	1,072	1,012	$1,304.04	$1,211.06	1.08	$121,276

Overall Cost Index: 1.14

Utilization Rates Per 1,000 Episodes

	Actual	Peers	Index
Specialist Visit Rate	1,387	1,407	0.99
Other Specialty Care Rate	839	616	1.36
Radiology Procedure Rate	391	365	1.07
MRI Procedure Rate	0	3	0.00
Laboratory Procedure Rate	908	887	1.02
Overall Prescribing Rate	5,290	5,360	0.99
Generic Prescribing %	0%	0%	--
ER Visit Rate	48	41	1.19
Admits per 1000 Episodes	0	25	0.00
Days per 1000 Episodes	0	63	0.00
Average Length of Stay	--	2.50	0.00

Episode Detail and Analysis

Atherosclerosis

Total Specialty Episode Costs: $1,406

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	2	$702.92	$0.00	$702.92	$0.00	$0.00	$0.00	$0.00	$0.00
Peers		$387.57	$0.00	$387.57	$0.00	$0.00	$0.00	$0.00	$0.00
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			0	1,500	0	0	0	0	0
Peers			0	1,125	0	0	0	0	0
Index			--	--	--	--	--	--	--

Atrial fibrillation & flutter

Total Specialty Episode Costs: $507

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	1	$507.36	$6.20	$106.50	$25.66	$0.00	$75.58	$293.43	$0.00
Peers		$1,715.52	$35.87	$465.51	$46.52	$69.43	$459.09	$533.92	$105.18
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			1,000	9,000	3,500	0	1,000	11,000	0
Peers			1,435	6,459	2,597	208	319	9,968	141
Index			--	--	--	--	--	--	--

Cardiomyopathy

Total Specialty Episode Costs: $7,224

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	3	$2,407.90	$32.88	$1,410.90	$2.32	$0.00	$613.18	$348.61	$0.00
Peers		$1,340.66	$19.72	$515.26	$49.66	$109.92	$300.36	$345.74	$0.00
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			1,333	3,750	167	0	1,000	10,333	0
Peers			511	3,479	736	205	379	8,779	0
Index			--	--	--	--	--	--	--

Congestive heart failure

Total Specialty Episode Costs: $2,818

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	1	$2,817.56	$0.00	$655.48	$28.58	$682.19	$384.57	$0.00	$1,066.73
Peers		$1,496.61	$27.44	$714.02	$20.78	$106.20	$314.81	$286.36	$26.99
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			0	4,000	100	1,000	1,000	0	500
Peers			854	3,447	349	243	269	8,881	41
Index			--	--	--	--	--	--	--

Hyperlipidemia, other

Total Specialty Episode Costs: $13,932

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	19	$720.64	$38.46	$188.41	$20.36	$35.22	$0.00	$421.22	$16.97
Peers		$631.67	$28.58	$106.52	$34.61	$37.56	$9.55	$409.05	$5.80
Index			1.35	1.77	0.59	0.94	0.00	1.03	2.93
Encounters per 1000 Episodes									
Actual			719	1,748	719	52	0	3,879	52
Peers			581	1,180	788	60	13	4,203	5
Index			1.24	1.48	0.91	0.86	0.00	0.92	11.35

Hypertension

Total Specialty Episode Costs: $67,221

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	43	$1,569.36	$88.65	$760.21	$27.68	$311.39	$7.03	$324.61	$49.79
Peers		$1,228.51	$75.29	$468.78	$19.68	$188.49	$148.75	$266.33	$61.20
Index			1.18	1.62	1.41	1.65	0.05	1.22	0.81
Encounters per 1000 Episodes									
Actual			1,474	4,513	275	533	47	7,891	47
Peers			1,401	3,557	298	364	156	7,021	46
Index			1.05	1.27	0.92	1.46	0.30	1.12	1.02

Ischemic heart disease

Total Specialty Episode Costs: $13,605

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	9	$1,511.63	$160.14	$759.84	$7.31	$381.47	$0.00	$202.87	$0.00
Peers		$2,378.04	$45.89	$672.60	$29.37	$278.61	$978.17	$288.30	$85.11
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			2,935	5,500	176	611	0	3,667	0
Peers			1,218	5,527	684	613	541	5,077	106
Index			--	--	--	--	--	--	--

Valvular disorder

Total Specialty Episode Costs: $11,319

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	14	$818.25	$17.60	$679.04	$0.90	$106.43	$10.24	$4.04	$0.00
Peers		$1,047.19	$32.37	$590.16	$14.37	$108.66	$179.66	$61.34	$60.62
Index			0.54	1.15	0.06	0.98	0.06	0.07	0.00
Encounters per 1000 Episodes									
Actual			428	3,217	145	217	72	289	0
Peers			828	3,654	448	225	245	1,854	61
Index			0.52	0.88	0.32	0.96	0.29	0.16	0.00

Member Quality Non-Compliance List

Member ID	Member Name	Date of Birth	Gender	Age	Condition	Case	Rule
0231115813		3/25/1957	M	49	Cardiology	HTN	Pt(s) taking an NSAID med.
1576957219		9/21/1956	M	50	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
1722584502		3/16/1959	F	47	Cardiology	HTN	Pt(s) taking an NSAID med.
3510814590		8/22/1968	M	38	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
5095625983		1/7/1951	F	55	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent LDL result <160mg/dL.
5095625983		1/7/1951	F	55	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
6189711566		7/4/1953	M	53	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
6189711566		7/4/1953	M	53	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
7310373120		4/9/1960	M	46	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
8090910733		6/10/1963	F	43	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
8090910733		6/10/1963	F	43	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
8365387487		11/5/1952	M	54	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
8577199106		6/16/1948	M	58	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
8577199106		6/16/1948	M	58	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.

Report Introduction and Interpretation

Patterns of Care

Episode Case Mix Summary

Panel Morbidity - Peer Distribution

Quality

Cost and Use

Episode Detail

Member Quality Non-Compliance

NATIONAL QUALITY FORUM

Resource Use Measure Evaluation 1.0
January 2011

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

Resource Use Definition:

- Resource use measures are broadly applicable and comparable measures of input counts—(in terms of units or dollars)-- applied to a population or population sample
- Resource use measures count the frequency of specific resources; these resource units may be monetized, as appropriate.
- The approach to monetizing resource use varies and often depends on the perspective of the measurer and those being measured. Monetizing resource use allows for the aggregation across resources.

NQF Staff: NQF staff will complete a preliminary review of the measure to ensure conditions are met and the form has been completed according to the developer's intent. Staff comments have been highlighted in green.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas)*.

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the subcriteria are met (TAP or Steering Committee)
High (H) – based on the information submitted, there is high confidence (or certainty) that the criterion is met
Moderate (M) – based on the information submitted, there is moderate confidence (or certainty) that the criterion is met
Low (L) - based on the information submitted, there is low confidence (or certainty) that the criterion is met
Insufficient (I) – there is insufficient information submitted to evaluate whether the criterion is met, e.g., blank, incomplete, or information is not relevant, responsive, or specific to the particular question (unacceptable)
Not Applicable (NA) - Not applicable (only an option for a few subcriteria as indicated)

Evaluation ratings of whether the measure met the overall criterion (Steering Committee)
Yes (Y)- The overall criteria has been met
No (N)-The overall criterion has NOT been met
High (H) – There is high confidence (or certainty) that the criterion is met
Moderate (M) – There is moderate confidence (or certainty) that the criterion is met
Low (L) - There is low confidence (or certainty) that the criterion is met

Recommendations for endorsement (Steering Committee)
Yes (Y) – The measure should be recommended for endorsement
No (N)-The measure should NOT be recommended for endorsement
Abstain (A)- Abstain from voting to recommend the measure

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
Staff Reviewer Name(s):	
NQF Review #: 1595	**NQF Project:** Endorsing Resource Use Standards- Phase II

BRIEF MEASURE INFORMATION

Measure Title: Measure Name: ETG Based DIABETES resource use measure

Measure Steward (IP Owner): Ingenix, 950 winter stre, waltham, Massachusetts, 02154

Brief description of measure: The measure focuses on resources used to deliver episodes of care for patients with Diabetes. Diabetes episodes are defined using the Episode Treatment Groups (ETG) methodology and describe the unique presence of the condition for a patient and the services involved in diagnosing, managing and treating diabetes. A number of resource use measures are defined for diabetes episodes, including overall cost of care, cost of care by type of service, and the utilization of specific types of services. Each resource use measure is expressed as a cost or a utilization count per episode and comparisons with internal and external benchmarks are made using risk adjustment to support valid comparisons.
As requested by NQF, the focus of this submission is for Diabetes episodes and will cover both measures at the Diabetes base and severity level and also a Diabetes composite measure where Diabetes episode results are combined across Diabetes severity levels. At the most detailed level, the measure is defined as the base condition of Diabetes and an assigned level of severity (e.g., resources per episode for Diabetes, severity level 1 episodes). Composite measures can then be created using these measurement units to meet a specific need. For example, a composite measure for Diabetes is derived by combining Diabetes episode results across Diabetes severity levels. Appropriate risk adjustment is applied to support comparisons (e.g., for physician measurement, adjusting for a physician's mix of Diabetes episodes by severity level when supporting a Diabetes composite comparison).

The focus of this measure is on Diabetes. However, Diabetes episode results could also be included in an "endocrinology", "chronic care", or other clinical composite for a physician, combining episodes in clinical areas similar to Diabetes. Further, an "overall" composite for a physician can be created, again by aggregating episode results across appropriate conditions and severity levels and applying proper risk adjustment when making comparisons.

Resource use service categories: Inpatient services: Inpatient facility services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department
Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

Brief description of measure clinical logic: This measure identifies patients with Diabetes and creates Diabetes episodes of care using the ETG methodology described in the ETG Construction Logic attached in our response to S.2. Each episode of Diabetes is characterized by an ETG Base class ID that specifies the type of condition; the ETG Base class ID representing Diabetes is 163000.

An episode of Diabetes will contain all clinically relevant information related to the condition. In addition to this information, certain diagnoses are considered co-morbidities or condition status factors for Diabetes. For example, Diabetes Type II is a condition status factor and Chronic Heart Failure is a comorbidity for Diabetes.

Each episode is assigned a severity level based on age, gender and the observed comorbidity and condition status factors. The severity level is an indicator of the relative resources expected to be required for the given episode of Diabetes.

The Diabetes episode clinical framework is defined by the services, or claim lines, that can begin an episode, the primary and incidental diagnosis relationships involved, how records group to an episode, including relative strength of relationship, and the severity logic employed.

If included in a composite or paired with another measure, please identify composite or paired measure:

Subject/ Topic Areas: Endocrine

Type of resource use measure: Per episode
Data Type: Administrative claims Other

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. Measure Steward Agreement. ***The measure is in the public domain or an intellectual property (measure steward agreement) is signed. Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.*** **A.1.Do you attest that the measure steward holds intellectual property rights to the measure? (If no, do not submit)** Yes **A.2. Please check if either of the following apply:** Proprietary measure **A.3. Measure Steward Agreement.** Agreement signed and submitted **A.4. Measure Steward Agreement attached:** NQF Resource Use Addendum FINAL.pdf	**A** **Y☐** **N☐**
B. Maintenance. ***The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. (If no, do not submit)*** Yes, information provided in contact section	**B** **Y☐** **N☐**
C. Purpose/ Use *(All the purposes and/or uses for which the measure is specified and tested:* Payment Program Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations)	**C** **Y☐** **N☐**
D. Testing. ***The measure is fully specified and tested for reliability and validity (See guidance on measure testing).*** Yes, reliability and validity testing completed	**D** **Y☐** **N☐**
E. Harmonization and Competing Measures. ***Have NQF-endorsed measures been reviewed to identify if there are related or competing measures? (List the NQF # and title in the section on related and competing measures)*** Yes ***E.1.*Do you attest that measure harmonization issues with related measure (either the same measure**	**E** **Y☐** **N☐**

focus or the same target population) have been considered and addresses as appropriate? (List the NQF # and title in the section on related and competing measures) Yes *E.2.Do you attest that competing measures (both the same measure focus and the same target population) have been considered and addressed where appropriate?* Yes	
F. Submission Complete. ***The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.***	**F** **Y☐** **N☐**
Have all conditions for consideration been met? **Staff Notes to Steward** (*if submission returned*)**:**	**Y ☐** **N ☐**
Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**	
File Attachments Related to Measure/Criteria: Attachment: ETG Construction Logic Diabetes.doc Attachment: S5_Diabetes_DataDictionary.xls Attachment: S5_Diabetes_DataDictionary-634387175847539250.xls Attachment: S6_DataProtocol-634387175938477332.xls Attachment: S7.2_Data Source Reference-634387176672075777.xls Attachment: S8_Diabetes_ClinicalLogic.xls Attachment: Attachment: S9.7_RU_Categories-634387178288179870.xls Attachment: S10_Risk Adjustment Method Example-634387178611306938.xls S12_sample_score_report_EPI-634387179570375576.pdf Attachment: SA_Reliability_Validity Testing_Diabetes.xls	

IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in performance. **Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All subcriteria must be met to pass this criterion.**	**Eval Rating**
High Impact **IM1. Demonstrated high impact aspect of healthcare:** Affects large numbers A leading cause of morbidity/mortality High resource use **IM1.1. Summary of evidence of high impact:** Diabetes is the seventh leading cause of death in the United States1. Diabetes affects 25.8 million people in the United States of which approximately 7 million persons are undiagnosed1. Diabetes is a major cause of heart disease and stroke and the leading cause of kidney failure, non-traumatic lower limb amputations and new cases of blindness among adults in the United States1. In 2010 approximately 215,000 people younger than the age of 20 had diabetes1. Based upon fasting glucose or hemoglobin A1c levels 35% of adults in the United States were pre-diabetic in 2005-2008. Applying this percentage to the 2010 United States population it is estimated that 79 million American adults aged 20 years or older are pre-diabetic1.	**1a** **H☐** **M☐** **L☐** **I☐**

Analyses of Ingenix healthcare benchmark data for a large population of individuals can support an understanding of the importance of Diabetes and the measurement of resource use. Using a 12-month sample population of more than 7 million individuals (primarily non-elderly) from 9 health care organizations, patients with Diabetes were identified using diagnosis codes assigned to medical administrative claim records. The percentage of costs for these patients related to Diabetes and other conditions was also estimated using ETG grouped data for the identified Diabetes patients. Using this benchmark data, 4.5% of the total population was identified as having Diabetes. Total cost per member per month for these individuals was $1,315. Approximately 15% of the total costs for the members identified with Diabetes were identified as being related to Diabetes (based on total costs grouped to those condition episodes for those patients), while an additional 20% of the total costs for diabetic members are the result of treating diabetic complications or comorbidities such as Diabetes, chronic renal failure, hypertension and stroke.
Analyses of the Ingenix healthcare benchmark data described above for episodes attributed to internal medicine physicians can further support an understanding of the relative financial importance of resource use measures for the condition. As shown below, across all physician episodes, the average total cost per episode is approximately $2,000. Pharmacy Services comprise the largest component of costs for these episodes.

Diabetes
# of Episodes 128,131

Cost per Episode:

Total Cost per Episode	$1,960
Primary Care Core Cost per Episode	$201
Specialty Care Cost per Episode	$301
ER Cost per Episode	$45
Radiology Cost per Episode	$25
Pharmacy Cost per Episode	$1,187
Laboratory Cost per Episode	$54
Hospital Services Cost per Episode	$147

Utilization per 1,000 Episodes:

Specialist Visits per 1000 Episodes	3,145
Radiology Encounters per 1000 Episodes	62
Laboratory Encounters per 1000 Episodes	1,424
ER Visits per 1000 Episodes	85
Admission Days per 1000 Episodes	142
Number of Admissions per 1000 Episodes	21
Number of Prescriptions per 1000 Episodes	12,057

IM1.2. Citations for evidence of high impact cited in IM1.1.:

Centers for Disease Control and Prevention. Diabetes fact sheet: national estimates and general information on diabetes in the United States, 2010. Atlanta, GA [Internet]: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011. Available at http://www.cdc.gov/diabetes/pubs/factsheet11.htm Accessed on February 1, 2011.

IM2. Opportunity for Improvement

1b

IM2.1. Briefly explain the benefits envisioned by use of this measure:

Benefits envisioned by this set of measures relates to identifying opportunities and measuring value. In particular, the measure and its components can support:
-- The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and

-- Measurement of the value delivered by individual providers, provider groups, and delivery systems – in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The

H☐ M☐ L☐ I☐

resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.

IM2.2. Summary of data demonstrating variation across providers or entities:

Variations in per capita spending - Inpatient-based and specialist-oriented pattern of practice
Regional differences in Medicare spending are largely explained by the more inpatient-based and specialist-oriented pattern of practice observed in high-spending regions. Neither quality of care nor access to care appear to be better for Medicare enrollees in higher-spending regions.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care. Ann Intern Med . 2003 138(4): 273-287.
The Dartmouth Atlas shows a more than two-fold variation in per capita Medicare spending in different regions of the country. Adjusting for price differences leads to only a modest decline in overall variations. It is utilization -- the amount of care delivered to patients -- that explains most of the regional variation in Medicare spending. Most spending variation was due to differences in use of the hospital as a site of care (versus, say, hospice, nursing home, or the doctor's office) and to discretionary specialist visits and tests.

Reflections on variations, The Dartmouth Atlas Of Health Care. Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=1338. Accessed on February 12, 2011.

Variations in clinical decision making – ambulatory care-sensitive conditions
Clinicians have identified a group of diagnoses referred to as "ambulatory care-sensitive" conditions – such as poorly controlled diabetes or worsening heart failure – which can be treated in either the inpatient or the outpatient setting, and for which hospitalization can often be prevented by better outpatient management. The variations among regions in admission rates of patients with these conditions can be ascribed to differences in clinical decision-making, rather than to differences in underlying illness rates. Hospitalization rates for these – and for most medical conditions – are also highly correlated with the local supply of hospital beds.
Hospital Discharges for Ambulatory Care-Sensitive Conditions Per 1,000 Medicare Enrollees, By Gender And Type Of Admission, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=20 Accessed on February 12, 2011.

Variations in the use of diagnostic tests and discretionary services
Variations in ECG ordering are not explained by patient characteristics. The tremendous nonclinical variations in ECG test ordering suggest a need for greater consensus about use of screening ECGs in primary care.
Randall SS, Bismruta M. Variation in routine electrocardiogram use in academic primary care practice. Arch Intern Med. 2001;161:2351-2355
Physicians in high-spending regions see patients back more frequently and are more likely to recommend screening tests of unproven benefit and discretionary interventions compared with physicians in low-spending regions; however, both appear equally likely to recommend guideline-supported interventions.

Physicians in higher-spending regions were much more likely than those in lower-spending regions to recommend discretionary services, such as referral to a subspecialist for typical gastroesophageal reflux or stable angina or, in another vignette, hospital admission for an 85-year-old patient with an exacerbation of end-stage congestive heart failure. And they were three times as likely to admit the latter patient directly to an intensive care unit and 30% less likely to discuss palliative care with the patient and family. Differences in the propensity to intervene in such gray areas of decision making were highly correlated with regional differences in per capita spending.

Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary decision making by primary care physicians and the cost of U.S. health care. Health Aff (Milwood), 2008; 27:813-823
Widely varying levels of health care spending across the United States are strongly correlated with the tendency of local physicians to recommend discretionary interventions. Physicians in regions of differing spending appear to differ only in their discretionary decision making. For decisions that are informed by evidence or practice guidelines (such as screening mammography and standard exercise tolerance testing), physicians were equally likely to recommend interventions regardless of local spending levels
Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary Decision Making By Primary Care Physicians And The Cost Of U.S. Health Care. Health Aff (Millwood). 2008; 27(3): 813–823.
Supply sensitive care
Supply-sensitive care accounts for more than half of all Medicare spending. In regions where there are more hospital

beds per capita, patients will be more likely to be admitted to the hospital. In regions where there are more intensive care unit beds, more patients will be cared for in the ICU. More specialists will result in more visits to specialists. And the more CT scanners are available, the more CT scans patients will receive. The Dartmouth Atlas has consistently demonstrated these relationships.

Patients do not experience improved survival or better quality of life if they live in regions with more care. In fact, the care they receive appears to be worse. They report being less satisfied with their care than patients in regions that spend less, and having more trouble getting in to see their physicians.

Supply sensitive care, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=2937 Accessed on February 14, 2011.
Numerous studies have found that higher bed supply is associated with more hospital use for conditions where outpatient care is a viable alternative. This includes most medical causes of hospitalization. In 2006, bed supply remained an important determinant of medical discharges.
The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. Annals of Internal Medicine. Feb 18 2003;138(4):273-287.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care. Annals of Internal Medicine. Feb 18 2003;138(4):288-298.
By far, the most significant factor associated with how much Medicare spends in any given region is the availability of medical resources. Studies from the Dartmouth Atlas Project have shown that the frequency with which physicians admit patients with chronic diseases to the hospital is highly correlated
with the number of beds per capita in the region. The frequency of visits to medical specialists is correlated with the number of specialists available. And the frequency with which chronically ill patients undergo many diagnostic tests and procedures also varies. We call such procedures and tests, along with the rates of hospitalization and physician visits, "supply-sensitive" care, or care that varies with the local availability of such medical resources as physicians, hospital beds, intensive care unit (ICU) beds, and diagnostic imaging equipment. The volume of supply-sensitive care that is delivered to the chronically ill is a powerful force driving Medicare spending. The utilization of supply-sensitive services for treating the chronically ill varies dramatically across different regions of the country, and it is responsible for much of Medicare spending. Local capacity, or the local supply of medical resources per capita, varies widely, and this local capacity bears directly on how much care is used to treat the chronically ill.

Wennberg JE, Fisher ES, Goodman DC, Skinner JS. "Tracking the care of patients with severe chronic illness." The Dartmouth Atlas of Health Care 2008. Available at: http://www.dartmouthatlas.org/downloads/atlases/2008_Chronic_Care_Atlas.pdf Accessed on February 14, 2011.

IM2.3. Citations for data on variation:

The variation in resource use across providers can be demonstrated using actual measures of physician performance for the condition episodes.

Data to explore this question were extracted from the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used for this analysis was primarily for commercial non-elderly individuals and covered the years 2009 thru 2010. In particular, data for 9 health care organizations including 7 million members were selected. The information was processed to produce Diabetes episodes. Incomplete and low cost outlier episodes were excluded. High cost outlier episodes were truncated at the high outlier threshold level. Episodes were attributed to providers in relevant specialties (peer groups).

The observed and expected costs for Diabetes episodes were computed, with expected costs based on averages for a provider's peers, adjusted to reflect the providers mix of Diabetes episodes by severity level. In particular, the following steps were performed:
-- Computed the observed experience for the provider being measured, across all episodes to be included in the comparison;

-- Computed the experience for the provider's peers. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peer benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed.;

-- Compared the observed experience to the expected result. This expected result is based on the peers average level of performance, adjusted to reflect the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio (O/E ratio) and is a risk adjusted measure. A ratio above 1.00 indicates greater resource use than peers, less than 1.00 lower resource use.

Variation in the O/E ratio across providers was assessed. In this way comparisons or relative resource use can be made, removing differences in the underlying mix of episodes included. Providers with greater than 20 Diabetes episodes were selected. For Diabetes 3,306 providers and 136,498 episodes were included covering the specialties of internal medicine, family practice and endocrinology. The providers in each specialty were compared with their peers only (same specialty and same enrolled population for the healthcare organization). However, OE results were aggregated across healthcare organizations and specialties to summarize variation.

The observed variation in cost of care performance can be summarized using the inter-quartile range for the O/E ratio (the difference between the 25th and 75th percentile physician OE ratios). The results showed variation in performance across these measure physicians. In particular, the inter-quartile range for the O/E ration for the following key measures was approximately: (e.g., 0.60 can be interpreted as 40 percent below peers, 1.40 as 40 percent above peers)

- Total Cost per Episode – 0.84 to 1.13
- Specialty Care Cost per Episode – 0.60 to 1.20
- Pharmacy Prescriptions per Episode – 0.81 to 1.18

As shown, the variation observed across providers is significant.

IM2.4. Summary of data on disparities by population group:

Health disparities are defined as differences in the occurrence, frequency, death and burden of diseases and other unfavorable health conditions that exist among specific population groups1. Examining health care differences or gaps experienced by one population compared to another is an integral part of understanding and improving health care quality2. The quality of healthcare delivered within the United States also differs from population to population due to differences in access to care, healthcare utilization and other factors2.

Measures of healthcare utilization allow for a broader understanding of access to care2. Barriers to care that are associated with differences in healthcare utilization may have a more significant impact on healthcare quality than other factors2. Several studies on disparities have relied upon measures of healthcare utilization and the data demonstrates some of the most significant differences in care among diverse groups2. Current efforts to improve healthcare delivery continue to rely upon measures of health care utilization to fully understand the complexities surrounding disparate health care outcomes. For example, greater utilization of services does not necessarily indicate better care. In fact, high use of some inpatient services may reflect compromised access to outpatient health services2.

In 2006, the Nation's 14 million health service workers provided approximately 960 million office visits, 673 million hospital outpatient visits, treated 37 million hospitalized patients and 1.4 million nursing home residents2. Approximately 70% of the non-institutionalized civilian population visited a provider's medical office or outpatient facility and about 60% received a prescription medication2. National health expenditures totaled over $2 trillion dollars in fiscal year 2006 with 5% of the population accounting for 55% of total costs2. Additionally, almost one-third of all healthcare expenditures are estimated to be the result of low-quality care, including overuse, misuse and waste2. Utilization resource measures provide a mechanism to better understand healthcare delivery patterns in order to improve the health of all population groups.

The cost and use measures included in this submission will provide an approach to assessing disparities. For example, episode-based measures of cost and use can be employed to create severity-adjusted comparisons of the resources expended in treating cardiovascular conditions, including supporting a focus on the condition-related resources.

IM2.5. Citations for data on disparities cited in IM2.4:

1. Health Disparities in the United States: Facts and Figures, American Society of Clinical Oncology, 2009
2. National Healthcare Disparities Report, U.S. Department of Health & Human Services, Agency for Healthcare Research and Quality, 2008

IM3. Measure Intent **IM3.1. Describe intent of the measure and its components/ Rationale (including any citations) for analyzing variation in resource use in this way** As noted in IM2.1, the intent of the measure and its components is to support: -- The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and -- Measurement of the value delivered by individual providers, provider groups, and delivery systems – in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.	**1c** **H☐** **M☐** **L☐** **I☐**
IM4. Resource use service categories are consistent with measure construct *Refer to IM3.1. & all S9 items to evaluate this criteria.*	**1d** **H☐** **M☐** **L☐** **I☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report*?	
Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, met? **Rationale:**	**Y☐** **N☐**

SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES	
Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented.	
MEASURE SPECIFICATIONS	
S1. Measure Web Page: ***Do you have a web page where current detailed measure specifications can be obtained?*** No	**Eval Rating 2a1/2b1**
S2. General Approach ***If applicable, summarize the general approach or methodology to the measure specification. This is most relevant to measures that are part of or rely on the execution of a measure system or applies to multiple measures.*** All of our submitted measures for Diabetes rely on a foundational "episodes of care" concept that uses the Ingenix Episode Treatment Groups (ETG) methodology. Episode-based resource use measurement provides a representation of a patient's course of treatment for a specific condition. The attached ETG General Methods Construct Logic provides a high level explanation of our ETG concept and a summary of the ETG approach to creating episodes of care for Diabetes. Attachment: ETG Construction Logic Diabetes.doc	

S3. Type of resource use measure:

Per episode

S4. Target Population:

S4.1. Subject/Topic Areas:

Endocrine

S4.2. Cross Cutting Areas *(HHS or NPP National health goal/priority)*

Care Coordination
Overuse

S5. Data dictionary or code table
Please provide a web page URL or attachment if exceeds 2 pages. NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less.

Data Dictionary:

URL:
Please supply the username and password:
Attachment: S5_Diabetes_DataDictionary.xls

Code Table:

URL:
Please supply the username and password:
Attachment: S5_Diabetes_DataDictionary-634387175847539250.xls

S6.Data Protocol (Resource Use Measure Module 1)
The measure developer must determine which of the following data protocol steps: data preparation, data inclusion criteria, data exclusion criteria, and missing data, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

Data Protocol Supplemental Attachment or URL:
If needed, attach document that supplements information provided for data protocol for analysis, data inclusion criteria, data exclusion criteria, and missing data (Save file as: S6_Data Protocol). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.

URL:
Please supply the username and password:
Attachment: S6_DataProtocol-634387175938477332.xls

S6.1. Data preparation for analysis
Detail (specify) the data preparation steps and provide rationale for this methodology.

Guidelines : Administrative medical and pharmacy claims, member enrollment and demographic information and provider characteristics describe the primary data sources used in creating ETG Diabetes episodes of care and measures of resource use per episode. The key data elements required to support ETG processing and the creation of resource use per episode measures for Diabetes are detailed in attachment S6_DataProtocol.

General recommendations for preparing data for ETG processing and the creation of resource use sub-measures are as follows:

-- The data for all required elements should be complete, valid and consistently populated. In particular:
-- Only final claims should be included in processing. Adjustments and pended/non-fully adjudicated claims should be removed;

-- All recorded diagnosis, procedure and NDC codes should be included and conform to standard ICD-9, HCPCS, CPT, NUBC revenue code and NDC coding conventions. Any non-standard, or "local" codes should be cross-walked to a valid code;

-- An assessment of the relative validity of diagnosis and procedural coding should be made. If significant differences in the prevalence or validity of diagnosis and procedural coding are observed across populations, data sources or administrative claims systems, these discrepancies should be validated and addressed, if relevant. If systematic discrepancies and data issues are the result of incomplete data, the members impacted by the incomplete information should be excluded from processing and measurement. An example is a defined population with significant evidence of missing or invalid coding or a population where primary care capitation is in place and claims or encounters for those services are not available;

-- Financial fields should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example;

-- An assessment of the relative validity of the financial information should be made. Systematic gaps in financial data should be validated and if resulting from incomplete data, the members impacted by the incomplete information should be excluded from processing. An example is a defined population with significant evidence of missing or invalid financial data where options are not available to estimate the financial amounts;

-- Inpatient facility claims should accurately represent the admission and discharge dates for the inpatient stay. Interim facility bills where the patient has not been discharged should reflect the time period of the services rendered and captured on the interim bill.

-- The member IDs used to identify a member should be unique – describing an individual member. The member ID field across claims and membership should follow the same format. Duplicate IDs for a member are not recommended;

-- Each member enrollment record should describe a unique enrollment span, that is, the input data includes one row per member for each continuously enrolled period where the member has consistent attributes. A member may have multiple enrollment records reflecting a gap in enrollment or a change to their member attributes (i.e. PCP or Pharmacy Benefit) over time.

-- It is recommended that member enrollment span overlaps are reconciled prior to processing;

-- A member's pharmacy benefit status should be noted and reflects whether or not the member has pharmacy data generally available for use in measurement. Examples of populations where pharmacy data may not be available include the individual not have pharmacy coverage for the defined enrollment period or pharmacy services managed by a pharmacy benefits manager (PBM) and the PBM data has not been integrated with the medical claims;

-- The provider IDs used to identify a provider should be unique – describing an individual physician or other provider. The provider ID field across claims and membership (Assigned PCP) should follow the same format. Duplicate IDs for a provider are not recommended;

-- Each provider ID should be assigned a specialty that reflects the primary specialty of the provider. This information is

used to support valid episode grouping and also to assign providers to an appropriate peer group to support episode analysis;

-- A place of service crosswalk table that maps each native place of service code to a standard format is required. Ingenix valid values include:
-- 11 – Office
-- 12 – Home
-- 21 – Inpatient Hospital
-- 22 – Outpatient Hospital
-- 23 – Emergency Room, Hospital
-- 24 – Ambulatory Surgical Center
-- 31 – Skilled Nursing Facility
-- 39 – Nursing Home, Custodial, Hospice
-- 49 – Ambulance
-- 51 – Inpatient Psychiatric Facility
-- 59 – Psychiatric Facility
-- 61 – Comprehensive Inpatient Facility
-- 69 – Rehab Facility
-- 81 – Independent Lab
-- 99 – Unknown or Other (this POS value should represent a small portion of the data for optimal results)

-- Provider Specialty on claims should accurately reflect the service category of the claim and support assignment of ETG Type of Provider for each claim. Type of Provider values used to support ETG processing include:
-- 0 – Clinician
-- 1 – Facility
-- 2 – Other

- Place of Service, Provider Specialty, CPT/HCPC Procedure Codes and Revenue codes should be accurate and support assignment of ETG Type of Service for each claim. Type of Service values used to support ETG processing include:
-- 0 – Ancillary
-- 1 – Medical/Surgical
-- 2 – Room and Board

S6.2.Data inclusion criteria
Detail initial data inclusion criteria and rationale(related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : In creating Diabetes episodes of care, ETG includes all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG methodology does not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers, non-standard diagnosis or procedural coding and other invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

In terms of resource use measure construction following ETG grouping, no additional data inclusion criteria are applied. Only Diabetes episodes are included in the measurement of Diabetes episode-based resource use, including the individual services that ETG groups to those episodes. As noted below in section 6.3, it is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated appropriately.

S6.3. Data exclusion criteria
Detail initial data exclusion criteria and rationale (related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : As described in the submission for S6.2, for the application of ETG episode logic for Diabetes, ETG accepts all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG methodology does not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers, non-standard diagnosis or procedural coding and other invalid information at the service level is performed by the

organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

ETG does include logic to identify high or low cost outliers at the episode level. Although this is not the same as detailed service level data exclusions, inappropriately high individual claims or mispriced claims, in general, will impact the outlier treatment of the Diabetes episodes the claim is grouped to.

In terms of resource use measure construction following ETG grouping, no additional data exclusion criteria are applied. Only Diabetes episodes are included in the measurement of Diabetes episode-based resource use, including the individual services that ETG groups to those episodes. It is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated appropriately.

S6.4. Missing Data
Detail steps associated with missing data and rationale(e.g., any statistical techniques used)

Specifications : Missing provider specialty assignment will impact the ability to assign record type to a claim line. In addition invalid and incomplete diagnosis and procedure coding, will impact the results of the episode grouping and the measures for Diabetes. For example, inaccurate coding may result in a service record not grouping to a Diabetes episode – due to the miscoding of a Diabetes diagnosis or the procedure code assigned to the service. ETG will attempt to group these services. However, invalid data may prevent this grouping to happen in an appropriate way. In this way, ETG handles data quality issues through the rigor of the logic designed to create appropriate episodes.

In terms of working with missing information during the episode grouping process, ETG uses the following approaches:

-- Missing Diagnosis Codes: If all four diagnosis codes are missing from a non-pharmaceutical claim the ETG application will use the procedure code to group, except when the procedure code requires a valid diagnosis code to be present. This requirement is per the ETG eligibility table. In cases where all diagnosis codes are missing and the procedure requires a valid diagnosis code to also be present, the service record will not group to a Diabetes episode and will be assigned to an error ETG.

-- Missing Procedure Codes: If there is no procedure code on a service record then the record will group based on the diagnosis codes or NDC drug code. If there is no diagnosis, procedure or pharmacy code on the claim, then the claim will not group to a Diabetes episode and will have an error code assigned to it.

--Missing Provider Specialty: If the provider specialty is not available on a service record then the record will be assigned an error ETG code and will not group to a Diabetes episode.

The services not assigned to an episode and noted as “errors” based on missing data are marked with an error ETG number. Services with these ETG numbers would not be included in a Diabetes episode or be used in episode-based resource measurement for Diabetes.

-- Missing Pharmacy Data: For some members and populations, pharmacy data can be missing generally, due to the different factors, including not having a pharmacy benefit with the entity collecting the data used in measurement or pharmacy services being managed by a pharmacy benefits manager (PBM) for the measurement entity. Where pharmacy data are not generally available for a member, adjustments are required to ensure valid comparisons.

The ETG grouping methodology for Diabetes itself does not require pharmacy data. Pharmacy services are treated as ancillary records and can never start an episode for Diabetes. Pharmacy services will join Diabetes episodes. However, missing pharmacy records will impact the observed cost of an episode – which will be underestimated, on average, where pharmacy data are missing. It is recommended that pharmacy benefit/data status be used as a separate category in risk adjusting pharmacy and total costs per episode. For example, the expected or “peer” results for a physician should reflect their mix of members with and without pharmacy benefits/data.

Eval Rating 2a1

H☐ M☐ L☐ I☐

Eval Rating 2b1

H☐ M☐ L☐ I☐

S7. Data Type: Administrative claims
Other

S7.1. Data Source or Collection Instrument
Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc.)

Both medical and pharmacy administrative service records (claims or encounters) are used to support the measures. Member enrollment span, pharmacy benefit status and age and gender are also required. Provider characteristics, including specialty and unique provider identifier also have importance to support episode grouping, attribution and definition of peers.

S7.2. Data Source or Collection Instrument Reference
(Please provide a web page URL or attachment). NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less)

URL:
Please supply the username and password:
Attachment: S7.2_Data Source Reference-634387176672075777.xls

S8.Measure Clinical Logic (Resource Use Measure Module 2)
The measure's clinical logic includes the steps that identify the condition or event of interest and any clustering of diagnoses or procedures. For example, the diagnoses and procedures that qualifies for a cardiac heart failure episode, including any disease interaction, comorbid conditions, or hierarchical structure to the clinical logic of the model. (Some of the steps listed separately below may be embedded in the risk adjustment description, if so, please indicate NA and in the rationale space list 'see risk adjustment details.')

Clinical Logic Supplemental Attachment or URL:
If needed, provide a URL or document that supplements information provided for the clinical framework, co-morbid interactions, clinical hierarchies, clinical severity levels, and concurrency of clinical events

URL:
Please supply the username and password:
Attachment: S8_Diabetes_ClinicalLogic.xls

S8.1. Brief Description of Clinical Framework
Briefly describe your clinical logic approach including clinical topic area, whether or not you account for comorbid and interactions, clinical hierarchies, clinical severity levels and concurrency of clinical events.

This measure identifies patients with Diabetes and creates Diabetes episodes of care using the ETG methodology described in the ETG Construction Logic attached in our response to S.2. Each episode of Diabetes is characterized by an ETG Base class ID that specifies the type of condition; the ETG Base class ID representing Diabetes is 163000.

An episode of Diabetes will contain all clinically relevant information related to the condition. In addition to this information, certain diagnoses are considered co-morbidities or condition status factors for Diabetes. For example, Diabetes Type II is a condition status factor and Chronic Heart Failure is a comorbidity for Diabetes.

Each episode is assigned a severity level based on age, gender and the observed comorbidity and condition status factors. The severity level is an indicator of the relative resources expected to be required for the given episode of Diabetes.

The Diabetes episode clinical framework is defined by the services, or claim lines, that can begin an episode, the primary and incidental diagnosis relationships involved, how records group to an episode, including relative strength of relationship, and the severity logic employed.

S8.2. Clinical framework
Detail any clustering and the assignment of codes, including the grouping methodology, the assignment algorithm, and relevant codes and rationale for these methodologies.

The Diabetes measure's episodes are defined using the Episode Treatment Group (ETG) methodology. Please note that

this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_Diabetes. This attachment provides an overview of ETGs and a summary of the methodology used for Diabetes episodes.
- S5_Diabetes_DataDictionary (Excel workbook attachment). This attachment describes the clinical relationships between diagnosis and procedure codes and the episode condition.
- S8_Diabetes_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of Diabetes methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

The individual Worksheets in these attachments that relate to the specific components of the methodology are referenced in the following specification.

The Diabetes ETG episode building process that supports Diabetes resource use measures has four important steps:
Step 1: Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
Step 2: Build Episodes from Anchor Records
Step 3: Group Non-Anchor Records to Episodes
Step 4: Finalize the Episodes (identify co-morbidities and complicating factors, and assign episode severity)

This section (S8.2 Clinical Framework) describes the first three steps in the episode building process. Sections S8.3 and S8.5 describe episode co-morbidities and condition status factors and episode severity.

Step 1- Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
Assign services to record types, identify anchor records and classify diagnoses and procedures on service records to support the creation of Diabetes and other episodes.

Step 1A: Assign Record Type to each Service:

Assign each service to one of the following 5 record types:

-- Facility: A claim record submitted by a treatment facility for room & board charges (F)
-- Surgery: A claim record submitted by a provider for surgical or related procedure (S)
-- Management: A claim record submitted by a provider related to the evaluation of a patient's condition (M)
-- Ancillary: A claim record submitted by any provider for laboratory, radiological or similar services (A)
-- Pharmaceutical: A claim record for a prescription drug claim (P)

Assign record type based upon servicing provider type and the nature of the service procedure.
- Assign provider type based on the specialty of the service provider. The "ExTypeOfProvider" worksheet of the attachment S5_Diabetes_DataDIctionary includes an example mapping of specialty to provider type. Based upon the specialty of the service provider on the claim record the provider type recognized by ETG is assigned. For example, using the "ExTypeOfProvider" worksheet a provider specialty code of 100 on the claim would be assigned the ETG provider type of Facility.
- Type of service is based on the service procedure code (CPT, HCPCS, Revenue, NDC). The worksheet "ProcToRecordType" in the attachment S5_Diabetes_DataDictionary includes the information required to assign record type based upon the procedure code on the claim record.
- Use the combination of type of provider and type of service to determine record type. The worksheet "ProcToRecordType" in the attachment S5_Diabetes_DataDictionary provides a mapping of provider type and type of service to record type. For example, procedure code 99025 (Initial surgical evaluation) is assigned a record type of Management (M) when the provider type is either clinician (see column "Clinician Record Type" where procedureCode=99025) or a facility (see column "Facility Record Type" where procedureCode=99025). This same procedure code would be assigned a record type of Ancillary (A) when the provider type is non-clinician (see column "Non-Clinician Record Type" where procedureCode=99025).

Examples of record type assignment include:
- An office visit record provided by an internist will be assigned a "Clinician" provider type and a record type of "Management (M)"
- A cholecystectomy provided by a general surgeon will be assigned a "Clinician" provider type and a record type of "Surgery (S)"

- A pharmacy prescription will be assigned a record type of “Pharmaceutical (P)”
- An injection for chemotherapy (e.g., HCHPS J-code) will also be assigned a record type of “Pharmaceutical (P)”
- An imaging service provided by a radiologist, orthopedic surgeon, facility or any provider will be assigned a record type of “Ancillary (A)”.

The worksheet “ExRecordType” in the attachment S5_Diabetes_DataDictionary includes further examples.

The assigned record type provides information to the Diabetes episode-building methodology about the nature of the service and whether the diagnostic and other information on the service provides confirmatory information for a clinician service (versus potentially rule-out information from imaging, lab or other diagnostic services). Record type plays an important role in how services can trigger episodes of care and join and/or modify existing episodes.

Step 1B: Identify Anchor Records. The record type assigned in Step 1A is used to identify anchor records. An anchor record indicates that a clinician has evaluated the patient, assigned a diagnosis and has initiated the treatment and care of the patient for the condition. If the record type assigned to the service is M, S, or F (Management, Surgery or Facility), the service is an anchor record. All other services are considered non-anchor records.

Steps 1C through 1F: Before episodes can be built from anchor records and non-anchor services can be assigned to episodes, the relationship of diagnoses and procedures to each condition, including Diabetes, need to be assigned. Steps 1C through 1F describe how these relationships are defined. These initial steps categorize diagnoses and procedures relative to each condition, saving this information for use in the subsequent steps described in Step 2 and Step 3.
Note that in some instances a service may have a potential clinical relationship to more than one condition. This concept has importance to episode building, in general, and for episodes of Diabetes. While each service can inform grouping decisions across multiple episodes, the ETG methodology assigns each service uniquely to a single episode. Such an approach ensures that double-counting does not occur when considering service cost and utilization in the creation of resource use measures. As a result, accurate decisions on assigning a service to an episode of Diabetes or to another condition require the assessment of both the relationship of a service to Diabetes and to all other conditions for a patient. The methodology described in this section classifies diagnoses and procedures based on their relationship to Diabetes and also the strength of that relationship relative to other conditions. Using ETG, accurate episode grouping for Diabetes and other conditions must occur in the context of all of a patient’s conditions.

Step 1C: Assign Diagnoses to Diagnosis Class
Assign each ICD-9 diagnosis code to a “diagnosis class”. There are three diagnosis classes applied across all diagnosis codes, including diagnosis codes eligible for Diabetes:
- Specific: These diagnosis codes indicate a specific disease as opposed to a sign or symptom. These codes are specific enough to be linked to a single ETG. ICD-9 diagnosis code 250.00 (diabetes, type II) is an example of a specific diagnosis code for Diabetes. It is primary to, and only eligible for an episode of Diabetes. Specific diagnosis codes are usually primary to and eligible for a single ETG.
- Non-Specific: Like specific diagnoses, these diagnosis codes represent a disease or condition, but are not specific enough to support linkage to a single condition. ICD-9 Diagnosis code 251 (Other disorders of pancreatic internal secretion) is an example of a non-specific ICD-9 code. Although this code represents disease as opposed to a sign or symptoms, it is not specific as to representing a single disease. Services with this diagnosis will be assigned to an episode based on both information related to a Diabetes episode as well as information related to other potential conditions.
- Signs and Symptom: These diagnosis codes represent signs and symptoms of disease as opposed to a disease or condition. For example, 788.42 (Polyuria) and 783.5 (Polydipsia)represent signs and symptoms rather than a disease. They could be related to multiple diseases. ETG assigns sign and symptoms diagnoses to the lowest specificity. Services with signs and symptoms diagnosis codes may be eligible for many ETGs due to their generic nature. These services will be gathered to episodes as a later step in the grouping process, after other, more specific, information has been considered.
Diagnosis class assignments determine how a service is grouped to an episode and the order in which it is considered. The ETG methodology considers one person at a time and an individual’s medical and pharmacy service records are grouped in several distinct passes. The methodology first processes the specific and non-specific diagnosis codes on anchor records so that concrete conditions/diseases are created. It then processes services with sign and symptom diagnosis codes in reverse chronological order (based on dates of service) to determine the best episode these services can group to.

Step 1D: Identify the Clinical Relationship Between Diagnosis Codes and Conditions, Including Diabetes

Match each diagnosis code with one or more conditions (ETGs) through a diagnosis eligibility table. In addition to mapping diagnosis codes to conditions, each diagnosis code is further ranked, based on its strength of association with a condition. A rank of "primary" or "incidental" is assigned to each diagnosis and condition combination, with a further ranking assigned to incidental relationships:
- Primary: A "primary" diagnosis/condition relationship is assigned where the diagnosis defines that condition. The diagnosis codes that are classified as primary to Diabetes are listed on the "PrimaryDxCodes" worksheet within the attachment "S5_Diabetes_DataDictionary" (Note: the word "primary" here is used to describe the relationship between a diagnosis and an episode, it is not used to indicate the position of the diagnosis code on the claim line. The diagnosis in any position on the claim line can have a primary relationship with Diabetes). This map is used to identify primary diagnoses for Diabetes. Examples of diagnoses ranked as primary for Diabetes are 250 (Diabetes mellitus), 250.1 (Diabetes with ketoacidosis) and 250.3 (Diabetes with other coma). Primary diagnosis codes can only be ranked as primary for a single ETG condition.
- Incidental: These diagnosis codes are eligible for a condition but are not classified as primary. These diagnosis codes can be incidental to other conditions. To support the linkage of these diagnosis codes to a final episode, a further ranking is assigned for each condition based on the relative strength of association between the diagnosis and condition. Values of low, medium, or high are assigned for each diagnosis/condition. The Diagnosis codes that are incidental to Diabetes are listed on the "IncidentalDxCodes" worksheet within the attachment "S5_Diabetes_DataDictionary". The column "diagnosisEligibilityType" in the worksheet describes the relative strength ranking where 3 represents a high association, 2 represents a medium association and 1 represents a low association.

Step 1E: Identify Relationships between Procedure Codes and Conditions, Including Diabetes
Match each procedure code with one or more conditions, including Diabetes, through a procedure eligibility table. All procedure codes that are eligible for Diabetes are listed on the "ProcedureCodes" worksheet within attachment "S5_Diabetes_DataDictionary". In the same way diagnoses can relate multiple conditions, a procedure can relate to more than one episode. The ProcedureCodes worksheet also includes a ranking of the strength of the clinical relationship of each CPT and HCPCS code with Diabetes, ranked from 1 to 4 based on the relative strength of the clinical relationship between the procedure and Diabetes. This relationship is included in the "ProcedureRank" column in the worksheet. A rank of 4 represents the strongest association and a rank of 1 the lowest. In this way, ETG considers not only the diagnostic information on a service when making grouping decisions around Diabetes, but also the service procedure and the strength of the relationship between the procedure and Diabetes relative to other potential conditions.

Step 1F: Identify Relationships Between Pharmacy Services and Conditions, Including Diabetes
The relationship between pharmacy services and Diabetes and other conditions is based on the pharmacy code assigned to the service. To support this assessment, the ETG methodology assigns each pharmacy service to a Drug Category Code (DCC). The DCC describes the drug's active ingredients and route of administration. DCCs are then mapped to ETGs and define the relationships between a drug and a condition. Most pharmacy services are defined using NDC procedure codes, however selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC by ETG (e.g., J-codes describing injections).
The "Pharmacy" worksheet in the attachment "S5_Diabetes_DataDictionary" describes the DCCs assigned to Diabetes. Similar to diagnoses and procedures, there are some instances a DCC code may be eligible for more than one ETG. In these cases, the ETG methodology uses strength of the clinical relationship between the DCC code and the episode condition. The "Rank" in the worksheet describes this strength of association for each DCC and Diabetes. The lower the value is for Rank, the stronger the association between the DCC and the episode. If multiple episodes are competing for a pharmacy service, this rank is used to support decisions on assignment.

Given the clinical relationships described in Steps 1A through 1F, the following steps are used to build episodes from anchor records.

Step 2- Build Episodes from Anchor Records.
Building Diabetes episodes from anchor records is a multi-step process that utilizes diagnostic and procedural information and the clinical relationships defined in Step 1. Anchor records are grouped in two passes through the patient's data. The first pass groups the anchor records with specific and non-specific diagnoses. The second pass groups anchor records with sign and symptoms diagnoses. All anchor records are grouped before all non-anchor records.

Step 2A: Use Anchor Records to Start an Episode of Diabetes Using Specific and Non-Specific Diagnoses
A service must be an anchor record to start an episode of Diabetes. The service must also have a procedure code that is

eligible for Diabetes and an ICD-9 diagnosis code that is primary for Diabetes. See worksheets "PrimaryDxCodes" and "ProcedureCodes" within attachment S5_Diabetes_DataDictionary for a complete list of diagnosis codes and procedure codes that are primary for Diabetes. All codes within the "PrimaryDxCodes" worksheet are considered primary to Diabetes. If an anchor record meeting these requirements is observed, start an episode for Diabetes.
As an example of an anchor record that starts an episode of Diabetes, an endocrinologist sees a patient and submits a claim record using the CPT procedure code 99212 (Office visit, established patient) with and ICD-9 diagnosis code 250 (Diabetes mellitus).
Note that a single anchor record can start more than one episode. For example, an anchor record with a diagnosis and procedure code combination that is eligible for Diabetes will start a Diabetes episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it will also start a Hypertension episode. (See Section I of the Attachment for S2 above for a discussion of the concept of "phantom episode clusters".)

Step 2B: Group Anchor Records to an Episode of Diabetes Using Specific and Non-Specific Diagnoses
Once an episode of Diabetes is started, group further anchor records to that episode. Consider specific and non-specific diagnoses on anchor records first.
First identify whether the anchor record is eligible for Diabetes. Eligible anchor records for Diabetes have a procedure code eligible for Diabetes and a diagnosis code that has either a primary or incidental relationship to Diabetes. See the "ProcedureCodes" worksheet within S5_Diabetes_DataDictionary for the procedure codes eligible for Diabetes. See the "PrimaryDxCodes" and "IncidentalDxCodes" worksheets within S5_Diabetes_DataDictionary for a list of the diagnosis codes primary and incidental to Diabetes.
For anchor records with eligibility to a Diabetes episode, apply the following steps to assign the anchor record to an episode.
Step 2B1 - If the anchor record is only eligible for the open Diabetes episode, group the anchor record to the Diabetes episode.
In some cases, an anchor record can be eligible to join more than one episode. This is true because a service may have more than one diagnosis code. Further, diagnosis codes that are incidental for Diabetes may also be eligible for another ETG condition.
Step 2B2 - If the anchor record is eligible for the Diabetes episode and another episode for the patient, apply the following tie-breaking steps to determine the episode an anchor record groups to:
-Assess the specificity of the diagnoses on the anchor record. Diagnosis class describes this specificity and was assigned to each diagnosis code in Step 1C (specific or non-specific).
-Assign the anchor record to an episode based on the diagnosis class. Episodes related to specific diagnoses take precedence over episodes related to non-specific diagnoses.
Specific diagnoses:
-If a diagnosis on the anchor record is specific and has a relationship with a single episode, assign the anchor record to that episode.
-If the anchor record has more than one specific diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the anchor record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the specific diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. Primary relationships between diagnosis codes and episode conditions have precedence over incidental relationships.
-If the strength of the relationship between the specific diagnosis codes and the episode conditions is the same, the time between the anchor record and the closest anchor for the open episode is used.
Non-specific diagnoses:
-If no specific diagnoses are observed on the anchor record, consider non-specific diagnoses in assigning the anchor record to an episode. Apply the same order of logic described directly above for specific diagnoses to the assignment of anchor records based on non-specific diagnoses.
At the completion of Step 2B, each anchor record with a specific or non-specific diagnosis has been assigned to an episode, including episodes of Diabetes.
Note that in the same way a single anchor record can start more than one episode (Step 2A), a single anchor record can also extend more than one episode, however the anchor record itself can only be assigned to one episode, as described above. For example, an anchor record with a diagnosis and procedure code combination that is eligible for Diabetes can extend a Diabetes episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it can also extend a Hypertension episode. (See Section I of the Attachment for S2 above for a discussion of the concept of "phantom episode clusters" and the concept of extending episodes.)

Step 2C: Group Anchor Records to an Episode of Diabetes Using Sign and Symptom Diagnoses
The last step in grouping Anchor records to Diabetes and other episodes involves processing anchor records with only sign and symptom diagnosis codes. All sign and symptom diagnosis codes for Diabetes are listed within the S5_Diabetes_DataDictionary on worksheet "IncidentalDxCodes" where column "specificity"="Sign and Symptom". An example is Chest Pain (ICD-9 786.5).
For these anchor records with eligibility to a Diabetes episode, apply the following steps to assign the anchor record to an episode.
Step 2C1 - If the anchor record is only eligible for the open Diabetes episode, group the anchor record to the Diabetes episode.
Step 2C2 - If the anchor record is eligible for the Diabetes episode and another episode for the patient, apply the following tie-breaking steps to determine the episode an anchor record groups to:
-If the anchor record has more than one sign and symptom diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the anchor record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the sign and symptom diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. For sign and symptom diagnoses, incidental relationships between diagnosis codes and episode conditions have precedence over primary relationships.
-If the strength of the relationship between the sign and symptom diagnosis codes and the episode conditions is the same, the time between the anchor record and the closest anchor for the open episode is used.
At the completion of Step 2C, each anchor record with a sign and symptom diagnosis has been assigned to an episode, including episodes of Diabetes.
After completing these steps, anchor records have been used to open episodes of Diabetes, as well as episodes for other conditions. Anchor records have been assigned uniquely to individual episodes based on the clinical logic described above and in the attachment "S5_Diabetes_DataDictionary".

Step 3. Group Non-Anchor Records to Episodes.
Non-anchor records (record type "Ancillary" and "Pharmacy") can not open episodes on their own, but can join episodes. For example, a service for a most recent LDL-C greater than or equal to 130 mg/dL (DM) (CPT code 3050F), with a diagnosis of 250 (Diabetes mellitus) can group to an open episode of Diabetes but can not open the episode itself.
Step 3A: Group Non-Anchor Records other than Pharmacy to an Episode of Diabetes Using Specific and Non-Specific Diagnoses
Once an episode of Diabetes is started and anchor records have been grouped, non-anchor records can group to that episode. Consider specific and non-specific diagnoses on non-anchor records first.
First identify whether the non-anchor record is eligible for Diabetes. Eligible non-anchor records for Diabetes have a procedure code eligible for Diabetes and a diagnosis code that has either a primary or incidental relationship to Diabetes. See the "ProcedureCodes" worksheet within S5_Diabetes_DataDictionary for the procedure codes eligible for Diabetes. See the "Pharmacy" worksheet within S5_Diabetes_DataDictionary for the pharmacy codes eligible for Diabetes. See the "PrimaryDxCodes" and "IncidentalDxCodes" worksheets within S5_Diabetes_DataDictionary for a list of the diagnosis codes primary and incidental to Diabetes.
For non-anchor records with eligibility to a Diabetes episode, apply the following steps to assign the record to an episode.
Step 3A1 - If the non-anchor record is only eligible for the open Diabetes episode, group the record to the Diabetes episode.
In some cases, a non-anchor record can be eligible to join more than one episode. This is true because a service may have more than one diagnosis code. Further, diagnosis codes that are incidental for Diabetes may also be eligible for another ETG condition.
Step 3A2 - If the non-anchor record is eligible for the Diabetes episode and another episode for the patient, apply the following tie-breaking steps to determine the episode the record groups to:
-Assess the specificity of the diagnoses on the non-anchor record. Diagnosis class describes this specificity and was assigned to each diagnosis code in Step 1C (specific or non-specific).
-Assign the non-anchor record to an episode based on the diagnosis class. Episodes related to specific diagnoses take precedence over episodes related to non-specific diagnoses.
Specific diagnoses:
-If a diagnosis on the non-anchor record is specific and has a relationship with a single episode, assign the record to that episode.

-If the non-anchor record has more than one specific diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the record to determine the episode that the anchor groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the specific diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the non-anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. Primary relationships between diagnosis codes and episode conditions have precedence over incidental relationships.
-If the strength of the relationship between the specific diagnosis codes and the episode conditions is the same, the time between the non-anchor record and the closest anchor for the open episode is used.
Non-specific diagnoses:
-If no specific diagnoses are observed on the non-anchor record, consider non-specific diagnoses in assigning the record to an episode. Apply the same order of logic described directly above for specific diagnoses to the assignment of non-anchor records based on non-specific diagnoses.
At the completion of Step 3A, each non-anchor record with a specific or non-specific diagnosis has been assigned to an episode, including episodes of Diabetes.

Step 3B: Group Non-Anchor Records other than Pharmacy to an Episode of Diabetes Using Sign and Symptom Diagnoses
The last step in grouping non-anchor records to Diabetes and other episodes involves processing non-anchor records with only sign and symptom diagnosis codes. All sign and symptom diagnosis codes for Diabetes are listed within the S5_Diabetes_DataDictionary on worksheet "IncidentalDxCodes" where column "specificity"="Sign and Symptom". An example is Chest Pain (ICD-9 786.5).
For these non-anchor records with eligibility to a Diabetes episode, apply the following steps to assign the record to an episode.
Step 3B1 -If the non-anchor record is only eligible for the open Diabetes episode, group the record to the Diabetes episode.
Step 3B2 - If the anchor record is eligible for the Diabetes episode and another episode for the patient, apply the following tie-breaking steps to determine the episode the record groups to:
-If the non-anchor record has more than one sign and symptom diagnosis and those diagnoses have clinical relationships with more than one episode, then use the strength of association of the procedure code for the record to determine the episode that the record groups to.
-If the strength of relationship between the procedure code and the different episode conditions is the same for the sign and symptom diagnoses, then the strength of the association of the diagnosis codes themselves are used to determine the grouping of the non-anchor record. As discussed in Step 1D, strength of association between diagnosis codes and conditions are described as primary or incidental. For sign and symptom diagnoses, incidental relationships between diagnosis codes and episode conditions have precedence over primary relationships.
-If the strength of the relationship between the sign and symptom diagnosis codes and the episode conditions is the same, the time between the non-anchor record and the closest anchor for the open episode is used.

Step 3C: Group Pharmacy Records to an Episode of Diabetes
Pharmacy services group differently than other non-anchor records because they usually do not have ICD-9 diagnosis codes associated with them to use in grouping. Instead, pharmacy records are assigned to Diabetes and other episodes using a table that maps NDC to a DCC code (Drug Category Code) based on the drug's active ingredients and route of administration. A DCC to ETG map is then used to inform the grouping for the service. The relationship between DCC codes and Diabetes are described in the "Pharmacy" worksheet in the attachment "S5_Diabetes_DataDictionary".
In some instances a DCC code may be eligible for Diabetes and another open episode for a patient. In these cases, where multiple episodes are observed for a patient where the DCC code has eligibility, use the strength of the clinical relationship between the DCC code and the episode to determine final assignment. The column "Rank" in the "Pharmacy" worksheet within attachment "S5_Diabetes_DataDictionary" describes that strength of association. The lower the value is for Rank, the stronger the association between the DCC and the episode.

Due to the size of the attachment the full list of NDC to DCC mappings has not been provided within this submission. This file is available upon request. The DCC mappings included in the S5 attachment provide a summary of the key clinical relationships between drugs and the conditions described by the relevant ETGs The NDC to DCC map would include the individual NDCs within a DCC that map to those relationships.

At the completion of Step 3C, all relevant records for Diabetes episodes have been assigned.

Step 4: Finalize the Episodes

Finalizing an episode of Diabetes involves determining whether or not the episode is complete, assigning co-morbidities and condition status factors and calculating a severity score and associated severity level. Co-morbidities and condition status factors will be discussed in section 8.3 and severity score calculation and level assignment is addressed in section 8.5.
In terms of episode completeness, Diabetes is a life-long, chronic condition. Therefore the general clean period logic described in the attachment for question S2 above is not applicable. All clinically consistent treatments for the care of a Diabetes patient will group to the episode of Diabetes for as long as data are available. (For the convenience of analytics and measurement, it is customary to segment chronic episodes, including Diabetes, into year long episode units.)

S8.3. Comorbid and interactions
Detail the treatment of co-morbidities & disease interactions and provide rationale for this methodology.

Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_Diabetes. This attachment provides an overview of ETGs and a summary of the methodology used for Diabetes episodes.
- S8_Diabetes_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of Diabetes methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

Co-morbidities and condition status factors are identified for each Diabetes episode. These factors provide specificity of the episode's clinical condition and also play a key role in assigning a severity score and level to the episode.

Steps to Assign Co-morbidities and Condition Status Factors to Diabetes Episodes:

Step 1 – Condition Status Factors for Diabetes Episodes.

Each Diabetes episode is evaluated to determine whether any Condition Status Factors for Diabetes are observed, To do this, the anchor records for the episode are evaluated using a comparison of their ICD-9 diagnoses with the diagnoses for the conditions status factors for Diabetes. The condition status factors used for Diabetes and the matching diagnoses for each are included in the "ConditionStatustoDxCodeMap" Worksheet in the attachment "S8_Diabetes_ClinicalLogic".

The following condition status factors are defined for Diabetes:
- Diabetes type I
- Diabetes type II or unknown type
- Diabetic coma
- Diabetic hyperosmolar coma
- Diabetic ketoacidosis

If these Condition Status Factor diagnosis codes are present on the anchor records for a Diabetes episode, that condition status factor is recorded for the episode.

Step 2 –Comorbidity Factors for Diabetes Episodes.

Each Diabetes episode is evaluated to determine whether any Comorbidity Factors for Diabetes are observed, To do this, the anchor records outside the Diabetes episode are evaluated using a comparison of their ICD-9 diagnoses with the diagnoses for the comorbidity factors for Diabetes. The comorbidity used for Diabetes and the matching diagnoses for each are included in the "ComorbtoDxCodeMap" Worksheet in the attachment "S8_Diabetes_ClinicalLogic".

Examples of the comorbidity groups for Diabetes include Ischemic Heart Disease, Congestive Heart Failure, and COPD.

In the example included in the S8_Diabetes_ClinicalLogic attachment (see worksheet "ExSevScore&Level"), the co-morbidities 80176 (Aortic aneurysm) and 80834 (Multiple sclerosis) are assigned to the Diabetes episode based upon the diagnosis information on anchor records that occur outside of the Diabetes episode.
Interactions between two co-morbidities or two condition status factors are also identified for Diabetes. These interactions are used in assigning severity to a Diabetes episode and are described in section 8.5.

S8.4. Clinical hierarchies
Detail the hierarchy for codes or condition groups used and provide rationale for this methodology.

As noted in S8.2 and S8.3, ETG uses different clinical relationships between diagnosis and procedure codes and conditions to support the creation of Diabetes episodes. Many of these relationships involve clinical hierarchies, including how specific and non-specific and signs and symptoms diagnosis codes are used. The relationship between primary and incidental diagnoses and the strength of association of incidental diagnoses to Diabetes and other episode concepts is a further example. A third example is the procedure hierarchies that apply across all concepts for Diabetes. Please see the discussion for sections S8.2 and S8.3 and the attachment for S2 for a summary of the role of rankings, strength of association and hierarchies are used in the ETG methodology for Diabetes. Further, as described below in the discussion of severity adjustment, ETG also uses hierarchies to identify the most important co-morbidities within a related set of co-morbidities for use in measuring severity.

S8.5. Clinical severity levels
Detail the method used for assigning severity level and provide rationale for this methodology.

Please note that this specification will reference different attachments included with the submission for these measures, including:

- S2_ETG_Construction_Logic_Diabetes. This attachment provides an overview of ETGs and a summary of the methodology used for Diabetes episodes.
- S8_Diabetes_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of Diabetes methodologies that relate to co-morbidities, condition status factors, and severity adjustment.

More specifically, apply the following steps:

Step 1 – Identify Condition Status Factors and Comorbidities in an Episode

Assignment of severity occurs after the identification of condition status factors and comorbidities as detailed in specification S8.3. Interactions between various co-morbidities also play a role in severity assignment as well as demographic factors. The combination of all of these factors are used to describe a "severity" score and level for an episode, where a higher level of severity indicates an expectation of a higher level of resources required to diagnose, manage and treat an episode of Diabetes.

The steps required to identify condition status and comorbidity factors for Diabetes are described in S8.3.

Step 2 – Map Episode Comorbidities to the Final Comorbidities used to Calculate Episode Severity

The individual comorbidities identified in S8.3 are further grouped to the final comorbidity factors used in calculating episode severity. This step is performed to combine the effects of related comorbidities on severity. Further, in some cases, hierarchies are used to limit final factors to those comorbidities within a related group that have the greatest impact on episode severity. For example, for Diabetes, Psychotic & schizophrenic disorders, Mood disorder, depressed and Mood disorder, bipolar are all qualified as comorbidities and are all conditions categorized as Psychotic and Mood Disorders. Given the related nature of these comorbidities, only one factor is used as the final comorbidity factor for computing severity. Steps 2.1 through 2.4 describe how this final comorbidity is selected.

Worksheet "Comorbidities" – includes the ComorbidityCodes and Comorbidity Groups used to determine severity for Diabetes. Co-MorbidityGroup2 is the final comorbidity factor used to compute episode severity. To determine this factor:

Step 2.1 – Assign ComorbidtyGroup1 and ComorbidityGroup2 to each ComorbidityCode. Using Psychotic and Mood Disorders as an example, Psychotic & schizophrenic disorders, Mood disorder, depressed and Mood disorder, bipolar would all be assigned to Psychotic and Mood Disorders for ComorbidityGroup1. Mood disorder, depressed and Mood disorder, bipolar would be assigned to "Mood Disorders" for ComorbidityGroup2 and Psychotic & schizophrenic disorders would be assigned to "Psychotic Disorders" for ComorbidityGroup2.
Step 2.2 – Assign Priority to each ComborbidtyCode. Psychotic & schizophrenic disorders, Mood disorder, depressed and Mood disorder, bipolar would be assigned a Priority value of 1, 2, and 3, respectively.
Step 2.3 – Across all of the values for ComorbidityCode within each ComorbidityGroup1, select the ComorbidityCode with the lowest value for Priority. As an example, if Psychotic & schizophrenic disorders and Mood disorder, bipolar were both observed, Psychotic & schizophrenic disorders would be selected due to its lower value for Priority (a Priority value of 1 takes precedence over a Priority value of 3)

The remaining values for ComorbidityCode and ComorbidityGroup2 define the final comorbidity factors used in determining Diabetes severity. In the above example (where Psychotic & schizophrenic disorders and Mood disorder, bipolar were both observed), Psychotic disorders (Psychotic & schizophrenic disorders) would be selected as the final comorbidity within Psychotic & Mood disorders.

Step 2.4 – Assign a risk weight to each remaining factor. Each risk weight reflects the incremental contribution of having a specific comorbidity factor on Diabetes severity. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight. For Psychotic disorders, a risk weight of 0.1723 would be assigned for a non-elderly patient. A risk weight of 0.1020 would be assigned for an elderly patient.

Step 3 – Identify Comorbidity Interactions

The interaction between two observed comorbidities can contribute to episode severity. Worksheet "ComorbidityInteractions" includes the interactions between Comorbidity Groups used to determine severity for Diabetes. The table describes pairings of the final comorbidity factors produced by Step 2 (identified by the values for ComorbidityGroup2).

Step 3.1 – Identify pairings of ComorbidtyGroup2 for the episode that are also observed in the Worksheet "ComorbidityInteractions"
Step 3.1 – Assign a risk weight to each qualified interaction. Each risk weight reflects the incremental contribution of having a specific comorbidity interaction on Diabetes severity. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight.

Step 4 – Identify Comorbidity Counts

For some ETG conditions the number of final comorbidity factors will impact episode severity – for example, where 3 or more co-morbidity factors are observed. For these episodes, a separate Worksheet "ComorbidityCounts" includes these additional severity factors and their assigned risk weights added for those episodes. Diabetes does not include any Comorbidity Count factors; this step does not apply to Diabetes.

Step 5 – Condition Status Factors

The Worksheet "ConditionStatuses" – includes the Condition Status factors used to determine severity for Diabetes. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status factor on Diabetes severity.

For each condition status factor observed, assign a risk weight. If the patient's age is less than 65, assign a risk weight using the column "Weight". If the patient's age is 65 or higher, use the risk weight using the value in the column ElderlyWeight. Use patient age as of the ending date for the measurement period to determine the appropriate weight.

Step 6 – Identify Condition Status Interactions

For some ETG conditions, the interaction between two observed condition status factors can contribute to episode severity. A separate tab, Worksheet "ConditionStatusInteractions" would be used to identify qualified pairings and their weight in calculating severity. Diabetes episodes do not use condition status interactions in calculating severity. Step 6 does not apply to Diabetes.

Step 7 – Identify Condition Status Counts

For some ETG conditions the number of final condition status factors will impact episode severity – for example, where 3 or more condition status factors are observed. For these episodes, a separate Worksheet "ConditionStatusCounts" includes these additional severity factors and their assigned risk weights added for those episodes. Diabetes does not include any condition status count factors; this step does not apply to Diabetes.

Step 8 – Assign Demographic Factors

The Worksheet "Demographics" includes the additional severity factors added based on age and gender. Each risk weight reflects the incremental contribution of having a specific Demographic factor on Diabetes severity. Based on patient age, assign the patient to an age range group. Using gender and age group, assign a demographic factor weight. Use patient age as of the ending date for the measurement period to determine the appropriate age range group.

Step 9 – Compute Severity Score

Sum the risk weights assigned for each of the relevant factors identified above. The sum of these weights is the overall severity score for the episode. As noted above, the higher the severity score for an episode, the more resources are expected relative to other Diabetes episodes.

As a note, the estimation of the risk weights used in computing severity for Diabetes episodes is based on empirical analyses of healthcare data for a benchmark population of over 25 million individuals. In particular, multivariate regression analyses were used where cost per episode for individual Diabetes episodes was the dependent variable and the defined array of co-morbidity and condition status factors and patient age and gender were the independent variables. The model was run separately for individuals 65 and over and those under 65 years of age. The resulting estimated parameters were used to assign weights to each factor described in the above tables. These weights and the presence of a particular set of factors for an episode are used to determine a Diabetes severity score for the episode.

Step 10 – Compute Severity Level

Based on the severity score, the severity "level" indicates a categorical ranking of where the specific episode is relative to the population of all Diabetes episodes. There are four potential severity levels for Diabetes, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. The "Thresholds" Worksheet in attachment "S8_Diabetes_ClinicalLogic" describe the three cut-off points that define the four levels of severity for Diabetes episodes.

Assign severity level to the episode depending on the episode severity score calculated in Steps 1-9 and where that score falls within the ranges defined in the "Threshold" Worksheet.

Example: Assigning Severity Score and Level to Diabetes Episodes

The example included within the S8_Diabetes_ClinicalLogic attachment (see worksheet "ExSevScore&Level") shows the calculation of severity score and level for a Diabetes episode.
The example describes a Male patient, age 47, observed to have a number of anchor records with a diagnosis that maps to the Diabetes ETG. The patient is also observed to have one condition status factor and two co-morbidities that are also eligible for Diabetes. The condition status factor (70006: Diabetes, Type I) was identified through one or more anchor records observed within the episode where the diagnosis on the records mapped to that condition status factor. The co-morbidities (80176: Aortic aneurysm and 80834: Multiple Sclerosis) both were identified on one or more anchor records observed outside of the Diabetes episode.

Assign severity markers and weights: The patient receives a severity marker for each of the condition status and co-morbidity factors and a risk weight is assigned to each. The patient also receives severity weight related to his age and

gender which fall into the "Male 45-54" range. Finally, the patient receives additional severity weight due to an interaction term included in the severity model for Diabetes.

Calculate severity score: A severity score of 1.9686 is calculated based upon the sum of:
- The Demographic weight of 0.7329 (see worksheet "Demographics" within S8_Diabetes_ClinicalLogic where column "gender"=M and column "ageRange"=45-54);
- The condition status weight for Diabetes Type I of 0.7338 (see worksheet "ConditionStatuses" within S8_Diabetes_ClinicalLogic where column "conditionStatusCode"=70006),
- The co-morbidity weight for Aortic Aneurysm of 0.4269 (see worksheet "Comorbidities" within S8_Diabetes_ClinicalLogic where column "comorbiditycode"=80176. The Aortic Aneurysm co-morbidity belongs to the Comorbiditygroup2 of Aterial Disease.);
- The comorbidity weight for Multiple Sclerosis of 0.1885 (see worksheet "Comorbidities" within S8_Diabetes_ClinicalLogic where column "comorbiditycode"=80834. Multiple Sclerosis belongs to the co-morbidity group of Congenital and Degenerative Disease CNS.).
- The interaction weight of -0.1135 for the interaction of the Arterial Disease and Congenital and Degenerative Disease CNS co-morbidity groups. (Using the worksheet "ComorbidityInteractions" within S8_Diabetes_ClinicalLogic the interaction of these two co-morbidity groups results in an adjustment of the severity score by -0.1135 (where column "FirstComorbidityGroup2"=Congenital and Degenerative Disease CNS and column "SecondComorbidityGroup2"=Arterial Disease).
- The final severity score, including the co-morbidity interaction adjustment is calculated as 0.7329 + 0.7338 + 0.4269 + 0.1885 + (-0.1135) = 1.9686

Calculate severity level: The severity score of 1.9686 falls with the range of > 1.7 and the episode is assigned to Severity Level 4.

S8.6. Concurrency of clinical events (that may lead to a distinct measure)
Detail the method used for identifying concurrent clinical events, how to manage them, and provide the rationale for this methodology.

ETG does provide methodology to deal with cases where a code will shift an episode from one ETG to another. For example, a concurrent renal transplant procedure will shift an episode of ETG Chronic renal failure to an episode of ETG Kidney transplant. There are no codes that will cause an episode of Diabetes to shift to another ETG.

As described in detail in S8.2, in the case where a diagnosis and procedure code on a claim are eligible for multiple episodes, a specific hierarchy of rules determines the most appropriate episode to group to, based on the rankings of the diagnosis and procedure code for the ETG of each episode. All of the eligibility and ranking information for Diabetes is described in the attachment for S5.)

For more information about episode building construction/logic, please refer to the attachment for S.2 .

S9. Measure Construction Logic (Resource Use Measure Module 3)
The measure's construction logic includes steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic. For example, any temporal or spatial (i.e., setting of care) parameters used to determine if a particular diagnosis or event qualifies for the measure of interest.

Construction Logic Supplemental Attachment or URL:
If needed, attach <u>supplemental</u> documentation (Save file as: S9_Construction Logic). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.)

URL:
Please supply the username and password:
Attachment:

S9.1. Brief Description of Construction Logic
Briefly describe the measure's construction logic.

Please refer to information provided in S2 and S8 for construction logic

S9.2. Construction Logic
Detail logic steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic.

Please refer to information provided in S2 and S8 for construction logic

S9.3. Measure Trigger and End mechanisms
Detail the measure's trigger and end mechanisms and provide rationale for this methodology.

As described in detail in S8, an episode is triggered by an anchor record. This is a claim record with a procedure indicating a face to face physician encounter, a surgical procedure by a physician or a facility charge indicating a confinement. The rationale for this is that the diagnosis and procedure codes on these record types are most likely to specify a valid clinical condition related to the individual. The length of the episode will depend on the subsequent records that occur within the ETGs clean period. When there is an interval longer than the clean period of the episode without any records eligible to group to the episode, it is considered complete.

Diabetes is one of a number of ETGs designated as chronic. Once an episode of Diabetes is triggered, a yearlong episode is created. The start and end dates are configurable by the user. Chronic ETGs specify chronic conditions that are usually life long.
For more information about episode building construction/logic, please refer to S8 and the attachment we provided in s.2 .

S9.4.Measure redundancy or overlap
Detail how redundancy and overlap of measures can be addressed and provide rationale for this methodology.

The ETG application is able to keep related conditions separate. For example, suppose that there are concurrent episodes of Diabetes and Hypertension and there is record eligible for both ETGs. A specific hierarchy of rules coupled with a set of eligibility tables with strengths of association of each diagnosis and procedure code for each ETG will uniquely determine which episode the record will group to. There are no ambiguous assignments and episode assignment of each claim record will be unique. For more information about episode building construction/logic, please refer to S8 and the attachment we provided in s.2 .

S9.5.Complementary services
Detail how complementary services have been linked to the measure and provide rationale for this methodology.

ETG does not group based on complimentary services. All claims group to the appropriate episode on their own merits.)
For more information about episode building construction/logic, please refer to the attachment we provided in s.2 .

S9.6.Resource Use Service Categories

Inpatient services: Inpatient facility services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department
Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

S9.7.Identification of Resource Use Service Categories
For each of the resource use service categories selected above, provide the rationale for their selection and detail the method or algorithms to identify resource units, including codes, logic and definitions.

The following resource-use categories are included as measures for this submission.

Cost of Care per Episode
1. Total
2. Primary Care Core Services, Total
3. Primary Care Core Services, Visits
4. Primary Care Core Services, Other (Non-Visits)
5. ER Services
6. Hospital Services, Total
7. Inpatient Acute
8. Inpatient Non-Acute
9. Other Outpatient
10. Laboratory Services
11. Radiology Services, Diagnostic, Total
12. Radiology, MRI, CT Scan Services
13. Radiology, Other Diagnostic Services
14. Specialty Care Services, Total
15. Specialty Care, Other Diagnostic Testing Services
16. Specialty Care, Evaluation & Management Services
17. Specialty Care, Medicine Services
18. Specialty Care, Surgery Services
19. Specialty Care, Other Services
20. Pharmacy Prescription Services

Utilization per 1,000 Episodes
1. PCP Visits
2. Specialist Visits
3. Specialist Referrals
4. Total Evaluation & Management Visits
5. ER Visits
6. Hospital Inpatient Admits, Acute
7. Hospital Inpatient Days, Acute
8. Laboratory Services
9. Radiology Services, Diagnostic, Total
10. Radiology Services, MRI/CT Scan Services
11. Radiology Services, Other Diagnostic Services
12. Pharmacy Prescriptions Services

Each resource use category measure is described below, including reference to the specific codes and logic used to identify the services involved.

I. General Methods

The following notes on General Methods apply to all resource measures described here and provide guidelines on service costs, the treatment of incomplete and outlier episodes, and the selection of time periods. The logic described for type of service plays a specific role in each measure. These general methods are employed across all submitted measures:

-- Service cost – as a guideline, the service cost used in resource use measurement should reflect the actual payments or costs associated with the service or a standard-priced resource cost amount. As a further guideline, the financial amount

used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example.

-- Complete episodes – Only complete episodes should be included in resource measurement. See the attachment for s.2 for a discussion of how ETG assigns completion status to an episode.

-- Outlier episodes – as a guideline, low outlier cost episodes should be excluded from resource use measurement. High outlier cost episodes should be included, but all costs truncated at the high outlier cost threshold used for the episode (a technique called "winsorization"). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier episode.

-- Episode Time periods – as a guideline, the episodes included in resource use measure should focus on a specific 12 month period, for example, all episodes ending in calendar year 2010.

-- Selecting Clinical Episodes – For Diabetes, select all remaining episodes with a Diabetes Base ETG

-- Type of Service. The type of service logic for each measure is described in the sections below. Each type of service definition includes an overview of the key steps used in identifying the relevant services used in measuring cost and utilization. As an initial step, prescription pharmacy services and hospital inpatient confinements are identified (more detail below). For the remaining services:

a. Providers are categorized into facility, anesthesiology specialties and other professional (not anesthesiology);
b. The attached document S9.5_RU_Categories then describes two levels of specifications used in assigning services to a type of service category;
c. The first table in the attachment IMAP_TOS_PROC includes one row per procedure code (CPT, HCPCS, Revenue). For each row, the table includes the procedure code, a short description and the columns PROFTOS, ANESTOS, OPTOS, and PCC_TYPE. PROFTOS, ANESTOS, OPTOS include standard TOS_I codes that are assigned to each procedure code based on whether the provider is a facility, anesthesiologist or other professional, using OPTOS, ANESTOS and PROFTOS, respectively;
d. Some services are also assigned a value for PCC_TYPE (described below);
e. The second table, IMAP_TOS, includes one row for each of the standard TOS codes included in PROFTOS, ANESTOS and PROFTOS and columns for the TOS_I codes, ENC_TOS, and ENC_TOP and a brief description of the TOS_I. ENC_TOS and ENC_TOP are used in defining encounters below.
f. These two tables are used in creating the measures described below.

-- Encounters. An Encounter is contact between an individual and the health care system for a related set of services. It is based on the type of service and the type of provider for a member on a specific day. Providing the ability to view data by encounters helps convey the scope and influence of all services associated with patient-health care system meetings. The concept of an encounter is used for the utilization measures described below. The following steps are used to assign an encounter value to each service record:

a. Hospital inpatient admissions. A hospital inpatient confinement is considered a single encounter (ENCOUNTER=1).
b. Prescription pharmacy. A pharmacy service record (claim record) is considered a single encounter (ENCOUNTER=1).
c. Ancillary Drug Administered Services. All Ancillary, Drugs Administered (TOS_I values 201 thru 211), are considered an encounter (ENCOUNTER=1).
d. For all other services, the number of encounters is dependent on the Type of Service and the Type of Provider assigned to the claims. In particular, the values included in the table IMAP_TOS for Encounter Type of Service (ENC_TOS) and Encounter Type of Provider (ENC_TOP) are used. As shown in IMAP_TOS, both the Encounter TOS and Encounter TOP are based on Type of Service (TOS_I) and can be assigned using table IMAP_TOS, and joining on TOS_I from the service record.
e. For these other services, medical service records are sorted by Member, Date of Service, ENC_TOS and ENC_TOP.
f. The calculation of encounters for services other than emergency room, laboratory and radiology services is 1 divided by the total number of records in the combination of Member, Date of Service, Encounter TOS, and Encounter TOP.
g. Additional logic. Emergency room, laboratory and radiology services need to have a different logic because these services often are billed using both a technical and professional component – where both a professional provider and facility provider are involved.
h. Any service with the following Encounter TOS values will use the additional logic when calculating

encounters.
1. ER professional and facility services (ENC_TOS=24)
2. Lab and pathology professional and facility services (ENC_TOS=29, 31)
3. Diagnostic and therapeutic radiology professional and facility services (ENC_TOS=47, 49)
i. For the services using the additional logic, for each Member, Date of Service, and ENC_TOS distinct combination, sum the number of records for each of the Encounter TOP values of 1 and 2.
1. Two cases can exist for these services: there are both facility and professional records in the combination; or there are only facility records or only professional records.
2. Where at least one facility record and one professional record, the encounter is divided up equally between the professional and technical components. Therefore, the calculations for Encounters for these situations are: 0.5 divided by {number of records with Encounter TOP = 1 (Facility)} and 0.5 divided by {number of records with Encounter TOP = 2 (Professional)}
3. Where all records have the same ENC_TOP value, the encounters calculation will be the generic calculation: 1 divided by {number of records in the combination of Member, Date of Service, Encounter TOS, Encounter TOP}
-- Cost and Utilization Measures. The actual resource use for an episode is the sum of the costs or encounters for those services grouped to the episode. Measures of actual cost or use per episode across episodes, is the sum of cost or use divided by the total number of episodes included in the measurement.

II. Cost of Care per Episode

Total Service Costs. Total services costs include the total costs for all services included in the selected clinical episodes.

Primary Care Core Services Costs. Primary Care Core (PCC) services include a select group of services traditionally performed by an individual's primary care physician. The PCC concept is similar to the idea of the group of services typically included in a primary care capitation definition. In particular, these services include non-inpatient evaluation and management services and selected imaging, diagnostic and minor procedure services. PCC Services are identified as follows:
-- First select services rendered by a primary care provider. The identification of primary care providers can be made configurable. At a minimum, these providers include the individual's assigned PCP. Further, to include covering providers, other primary care providers in the network are included, defined using either a list of provider ids or all physicians with a specialty of internal medicine, family practice, geriatric medicine, adolescent medicine and pediatrics, or both (e.g., using a list to include specific OB/GYN providers in addition to all providers with primary care specialties).

i. The CPT procedure code on the selected services is then used to identify:
1. PCC Services Total
2. PCC Services, Visits and
3. PCC Services Other.
ii. The CPT procedure codes assigned to these categories are included in the column PCC_TYPE in the attachment table IMAP_TOS_PROC. Values of "Visit" and "Other" are used. Blank entries for a procedure code indicate that they are not included as a PCC service.

-- ER Service Costs. These services include professional and facility emergency room services.
i. Professional ER Services are identified as having values of 1803 thru 1805 in IMAP_TOS
ii. Facility ER Services are identified as having values of 801 and 802 in IMAP_TOS

-- Hospital Costs. Includes the facility cost of an inpatient stay and services provided by an outpatient facility other than those defined elsewhere (e.g., ER, Lab, Radiology, Other). These services include professional and facility emergency room services.
i. Inpatient Acute Services are identified as having a value of 601 in IMAP_TOS
ii. Non-Inpatient Acute Services are identified as having a value of 703 in IMAP_TOS
iii. Other Outpatient Hospital Services are identified as having values of 901 thru 1399 in IMAP_TOS

-- Laboratory Services. These services include professional and facility laboratory services, other than those professional services assigned to Primary Care Core.
i. Professional Lab Services are identified as having values of 2101-2118 (Professional, Lab) or 2501-2511 (Professional, Pathology) in IMAP_TOS

ii. Facility LAB Services are identified as having values of 1001 thru 1005 in IMAP_TOS

-- Radiology Services, Diagnostic. These services include diagnostic professional and facility radiology services, other than those professional services assigned to Primary Care Core:
i. Professional Radiology, MRI, CT Scan Services are identified as having values of 2901 thru 2903 in IMAP_TOS
ii. Facility Radiology, MRI, CT Scan Services are identified as having values of 1201, 1203, 1204 in IMAP_TOS
iii. Professional Radiology, Other Diagnostic Services are identified as having values of 2905, 2906, 2907, 2908 in IMAP_TOS
iv. Facility Radiology, Other Diagnostic Services are identified as having values of 1202, 1206, 1207, 1208 in IMAP_TOS
v. Note that Therapeutic Radiology is included in Specialty Care Services, Medicine

-- Specialty Care Services. These services include those services not identified above and are categorized as follows (including TOS_I values in IMAP_TOS):
i. Specialty Care, Other Diagnostic Testing
1. 1701-1733 (Professional, Diagnostic)
ii. Specialty Care, Evaluation & Management
1. 1601-1609 (Professional, Consult)
2. 2001-2013 (Professional, Inpatient Visit)
3. 2401-2411 (Professional, Office Visit)
4. 2717-2719 (Professional, Home Visit)
5. 2729-2731 (Professional, Domiciliary/Rest Home Visit)
6. 2801-2807 (Professional, Preventive Medicine)
7. Excludes any services assigned to Primary Care Core
iii. Specialty Care, Medicine
1. 1401-1405 (Professional, Allergy Tests)
2. 1901-1901 (Professional, Immunizations / Injection)
3. 2909-2915 (Professional, Therapeutic Radiology)
iv. Specialty Care, Surgery
1. 3001-3214 (Professional, Surgery)
v. Specialty Care, Other
1. 101-131 (Ancillary, DME)
2. 201-211 (Ancillary, Drug Admin)
3. 301-307 (Ancillary, Home Health)
4. 401-403, 431 (Ancillary, Services and Supplies)
5. 405-414 (Ancillary, Med and Surg Supplies)
6. 416-424 (Ancillary, Orthotics)
7. 425-429, 432 (Ancillary, Supplies)
8. 433-436 (Ancillary, Oxygen/Resp)
9. 437-446 (Ancillary, Prosthetics)
10. 448-449 (Ancillary, Vision)
11. 450-459 (Ancillary, Rpt/Trking)
12. 501-503 (Ancillary, Transportation)
13. 1501-1599 (Professional, Anesthesia)
14. 2203-2212 (Professional, Mental Health)
15. 2302-2317 (Professional, Obstetrics)
16. 2601-2625 (Professional, Phys Medicine/Rehab)
17. 2701-2715, 2721-2728 (Professional, Professional Other)

III. Utilization per 1,000 Episodes

Encounters are used for all utilization counts for the utilization measures described below.

Evaluation and Management Visits. E&M Visit services by all professional providers and include the following TOS_I values from IMAP_TOS:
i. 1601-1609 (Professional, Consult)
ii. 1803-1805 (Professional, ER)

iii. 2001-2013 (Professional, Inpatient Visit)
iv. 2401-2411 (Professional, Office Visit)
v. 2717-2719 (Professional, Home Visit)
vi. 2729-2731 (Professional, Domiciliary/Rest Home Visit)
vii. 2801-2807 (Professional, Preventive Medicine)

PCP Visits. PCP Visits include E&M visits rendered by a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Visits. Specialist Visits include E&M visits rendered by a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Referrals. A Specialist Referral is indicated using E&M visits and indicates the first instance of the Provider for an E&M service for that member. A specialist is a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

ER Visits. Indicates an ER service encounter. ER services are defined by a TOS_I value of Facility Outpatient, ER (801, 802) or Professional, ER (1803, 1805).

Radiology Services, Diagnostic. Radiology utilization is defined as an encounter for the following Types of Service:
-MRI/Cat Scans – Facility Outpatient (1201, 1203, 1204), Professional (2901, 2902, 2903)
-Other Diagnostic Radiology – Facility Outpatient, Diag. Radiology (1202, 1206, 1207, 1208), Professional, Diagnostic Radiology, Nuclear Medicine (2905 thru 2908)

Laboratory Services. Laboratory utilization is defined as an encounter for the following Types of Service:
i. Facility Outpatient, Lab (1001, 1003, 1005)
ii. Professional, Lab, (2101 thru 2118)
iii. Professional, Pathology (2501 thru 2511)

Pharmacy Services. A pharmacy service prescription record.

Inpatient Admits and Days. Number of unique inpatient stays. An inpatient stay describes the entire stay by a patient in a facility at the same level of care. Transfers to a different level of care at the same facility results in a new admission. Acute inpatient stays describe inpatient confinements in an acute care facility. Non-acute inpatient stays describe inpatient confinements in a skilled nursing facility, transitional care unit/rehab, or other longer term/sub-acute facility. Inpatient days describe the difference between inpatient admission and discharge dates. Inpatient stays where the admission and discharge dates are equal are assigned one inpatient day.

If needed, provide specifications URL (preferred) or as an attachment:

URL:
Please supply the username and password:
Attachment: S9.7_RU_Categories-634387178288179870.xls

S9.8. Care Setting; *provides information on which care settings the measure encompasses.*

Ambulatory Care : Ambulatory Surgery Center (ASC)
Ambulatory Care : Clinic/Urgent Care
Ambulatory Care : Clinician Office
Emergency Medical Services
Ambulance
Home Health
Hospice
Hospital/Acute Care Facility
Imaging Facility
Laboratory

S10.Adjustments for Comparability (Resource Use Measure Module 4)
External factors can mingle and affect or confound a measure's result. Confounding occurs if an extraneous factor causes or influences the outcome (e.g., higher resource use) and is associated with the exposure of interest (e.g., episode of diabetes with multiple co-morbidities). Measure developers often include steps to adjust the measure to increase comparability of results among providers, employers, and health plans.

S10.1. Risk adjustment method
Define risk adjustment variables and describe the conceptual, statistical, or other relevant aspects of the model and provide rationale for this methodology.

The attachment for S2 and responses to S8 above provided a description of the approach used by ETG to assign a severity score and level to each Diabetes episode. To do this, ETG first assesses the observed co-morbidities and condition status factors for an episode and the patient's age and gender. ETG then assigns a weight to each factor found to influence the relative risk of an episode of Diabetes. These weights and factors are condition-specific and were estimated using Diabetes episode results for a large population. The overall severity score for an episode is the sum of these weights for all factors observed. Using the severity score, a severity level is created, with each Diabetes episode assigned to one of four severity levels.

The approach used by ETG to assign episode severity has several advantages. First, the approach uses broad clinical profile of an episode, describing its clinical status and that of the patient. Second, the weightings assigned describe the incremental contribution of each factor to overall episode severity. Further, the approach used for severity is condition-specific – a separate model and weightings are constructed for each condition, including Diabetes. These severity results provide the key information required to support risk adjusted comparisons using Diabetes episodes.

Risk adjustment is an important step in resource use measurement. Measures of the cost of care for an organization or provider can be impacted by the underlying risk and severity of the patients they enroll or manage. Case-mix or risk adjustment addresses these differences and supports more consistent and equitable comparisons. These approaches allow a focus on differences in resource use deriving from differences in the practice of medicine rather than differences in the mix of episodes or patients.

The level of severity assigned by ETG to an episode is used to support risk adjustment. The risk adjustment approach includes three important steps:
-- Compute the observed experience for the provider being measured, across all episodes to be included in the comparison;

-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peers benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed;

-- Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The table in S10.1 provides an example comparing the cost of care performance of two cardiologists using episodes of care and the condition of Diabetes. The analysis used only complete, non-outlier Diabetes episodes. The upper section of the table summarizes results at the condition and severity level. A higher severity level for a condition indicates the presence of one or more condition status factors and/or co-morbidities that impact the resources required for treatment. The table also summarizes results for Diabetes, across all severity levels.

The table shows the number of episodes attributed to the cardiologist, the observed cost per episode, peers cost per episode (the "expected" amount), and the ratio of the cost per episode of the cardiologist to his peers. By condition and severity level, the peers cost per episode is the average experience of all cardiologists included in the measurement for those episodes. The peer's experience is risk adjusted and assumes the same mix of episodes (by condition and severity) as the physician being measured. Notice that for the overall Diabetes summary, the peers cost per episode for Dr. Jones is $2,081, while that amount for Dr. Smith is $1,841. The higher amount for Dr. Jones indicates a higher case-mix and greater expected costs relative to Dr. Smith. These peer amounts, adjusted for the specific mix of episodes observed for

the physician being measured, capture the risk adjustment appropriate for the analysis.

In the last column, a relative cost ratio less than 1.00 indicates that the observed cost per episode for a provider is less than his peers. As shown, Dr. Jones cost is lower than peers and Dr. Smith is higher cost than peers. An additional report using the same measure information could summarize results by type of service, or specific utilization such as the use of a specific diagnostic test or treatment, providing greater insights into the factors behind differences in resource use. The risk adjustment for these measures would use the same approach as described here for total cost per episode.

If needed, provide supplemental information via a web URL (preferred) or attachment with the risk adjustment specifications.

URL:
Please supply the username and password:
Attachment: S10_Risk Adjustment Method Example-634387178611306938.xls

S10.2. Stratification Method
Detail the stratification method including all variables, codes, logic or definitions required to stratify the measure and rationale for this methodology

ETG stratifies episodes by the intensity of service, or total cost. For a given episode, a severity score is assigned based on demographic factors (gender and age) and the presence of comorbidities and complications. The determination of this severity score is described in sections 8.3, 8.4 and 8.5. Once a severity score is determined, a severity level, a number between 1 and 4 is assigned based on a table that relates severity levels to severity scores for each ETG. The method for determining the severity levels is described in section 8.5. The severity level can then be used to stratify episodes by severity, measured as resource consumption.)

S10.3. Costing Method
Detail the costing method including the source of cost information, steps to capture, apply or estimate cost information, and provide rationale for this methodology.

The measure does not specify the specific costing method to be used for cost of care resource use measures. The financial amounts used should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example

S11. Measure Reporting (Resource Use Measure Module 5)
The measure developer must determine which of the following Measure Reporting functions: attribution approach, peer group, outliers and thresholds, sample size, and benchmarking and comparative estimates, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

S11.1. Detail attribution approach
Detail the attribution rule(s) used for attributing costs to providers and rationale for this methodology (e.g., a proportion of total measure cost or frequency of visits during the measure's measurement period) and provide rationale for this methodology.

Attributing patients and episodes to appropriate physicians and groups is a challenging step in cost measurement. Over some period of time a patient can have multiple conditions and, in many cases, multiple providers caring for the same condition. For example, for an episode of hypertension, a patient can be managed by their primary care physician, an internist, and also receive services from a cardiologist. For a patient with coronary artery disease, an internist, a cardiologist, and a surgeon can all play a key role in providing the patient's care. A methodology is required

to identify these episodes for a patient and the providers responsible for the services performed within those episodes.
As a guideline, some principles are involved in determining a valid approach to be used in assigning episodes:
-- The approach must be valid conceptually. It must be defensible, understandable and accepted by providers, health plans, and other users of the measurement results;

-- The approach must be supported by readily available information, including the outputs from an episode grouping;

-- The approach should be robust across applications – working well for different sources of health plan data, patient populations and over time;

-- The approach should be flexible and consider the characteristics of the specialists being compared and the nature and severity of their patients and episodes;

-- Both activity-based and population-based approaches should be supported. An activity-based approach, describes attribution where an episode is assigned to the providers responsible for the greatest amount of activity during the course of the episode. Activity can be measured using different concepts including service costs, episode clusters, or patient visits.

A population, or panel-based approach is sometimes used when measuring performance for primary care physicians (PCPs), in particular where providers are performing a gatekeeper function for a population of members. In this case, responsibility for a member's qualified episodes of care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during those episodes.
-- "Sufficient" evidence of the provider's responsibility for the episode should exist. Thresholds should be considered that prevent providers from "winning" episodes where they have a small amount of involvement – relative to their physician peers or relative to all physicians involved in the episode.

-- Attributing the same episode to multiple providers in different specialties should be considered, when appropriate.

Care during an episode can include two types of services: services where important clinical decisions are made regarding the course of care and services that are a response to those decisions. Office visits, consultations and other evaluation and management services are examples of the first type of services. As part of these services, decisions to perform tests, prescribe drugs or order other ancillary services are made. The second type of service includes diagnostic lab, imaging, other tests, DME, drug therapies and treatments. These services are typically responses to decisions made regarding the course of care. Some services, such as surgery, may describe a closely linked bundle of care and relate to both categories – where the surgeon has some role in the decision to perform the procedure and also performs the surgery itself.
The dichotomy above suggests two important concepts for assessing approaches to attribution. First, the measure of "activity" to be used in identifying a responsible provider should focus on those types of service where decisions regarding the course of care and management of the episode take place. Second, the decision on the approach to be used for attribution may differ by specialty. In the case of a group of providers such as surgeons, where the majority of their services may be of the second type – after the decision to undergo surgery has been made – using cost as the activity measure for attribution may make sense. However in the case of PCPs or medical specialists, non-acute E&M visits or the number of episode clusters (qualified services), may be a superior service activity measure for determining episode responsibility.
As a guideline, four different general options for physician episode attribution can be considered to attribute episodes to individual providers – three activity-based and one population-based approach. Each of these options can be supported using standard outputs from ETG and the measures described in this submission. For each option, the description below assumes the following steps have been performed prior to attribution:
-- ETG episode grouping – producing the detail and summary output files to be used in attribution and measurement;

-- Identification of the comparison peer group and the individual physicians to be included;

-- The selection of qualified episodes for the peer group. Qualified episodes include those episodes with an ETG that matches the pre-defined list to be used for that peer group. Qualified episodes are further limited to complete, non-outlier episodes that fall within the time period defined for measurement.

For this discussion, it is assumed that the objective is to assign a single winner, if possible, for each peer group in which the episode is relevant, but allow providers in different peer groups to be assigned the same episode. To support this, the

following logic would be applied separately, peer group by peer group. The activity-based options are described first. Although these approaches are described for attribution at the individual physician level, they could also be applied using physician groups as the unit for attribution.
Approach 1 - Physician Episode Attribution using Professional Service Costs. This attribution approach identifies the responsible physician for an episode as that provider rendering the greatest amount of professional service costs during the episode.
Professional services are those performed by a clinician in managing and treating the patient during an episode of care, including visits and consultations, surgery and therapies. Professional services exclude inpatient and outpatient services billed by a facility and also typically exclude ancillary services, such as laboratory, imaging, DME, injectibles, medical and surgical supplies, transportation, pharmaceuticals, etc. One modification of the "professional services" to be used in this attribution approach that has been proposed by some is the use of information on the "ordering" provider, for a pharmacy prescription or diagnostic test. If available, this information could be used to extend the concept of services "rendered" by a professional provider. Some ETG users have assigned total costs for a cluster to the cluster provider as a way to extend this type of concept for attribution – the argument being that cluster ownership may suggest that the physician played an important role in the decisions to perform the ancillary services grouped to the cluster.
Using professional service costs for attribution involves the following steps:
-- For each qualified episode, sum the costs of all professional services grouped to that episode, by physician.

-- Identify those physicians with episode costs (if any) that are also included in the peer group being measured. Disregard any episodes without one or more physicians for that peer group;

-- Identify the peer group physician with the greatest amount of total costs. If two or more peers are found to have the most costs, apply an appropriate "tie-breaker" to determine the winning physician (discussed below).

-- For each physician, compute their professional costs, as a percentage of costs for all clinicians for the episode and also as a percentage of all costs for all physicians in the peer group. These amounts can be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).

After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest amount of professional costs, is the responsible provider for that episode for that peer group.

Approach 2 - Physician Episode Attribution using Episode Clusters. This attribution approach identifies the responsible physician for an episode as that provider in the peer group owning the greatest number of "clusters" within the episode. As described in the attachment for S.2, other than the individual service, the cluster is the basic unit of an ETG episode. Episode clusters are created using anchor records. Anchor records represent services provided by a clinician engaging in the direct evaluation, management or treatment of a patient. Office visits, therapies, and surgical procedures are examples. An anchor record indicates that a clinician has evaluated a patient's illness and has decided on the types of services required to further identify and treat the patient's condition. ETG links an anchor record with related services to form a cluster. Clinically homogeneous clusters are then combined to create episodes of care.
The clinical nature of an episode cluster makes it a natural candidate as an activity measure for episode attribution. In particular, the anchor records that define a cluster represent those types of service where decisions regarding the course of care and management of an episode take place. An additional benefit of episode clusters is that an anchor record service for a cluster can reside in another episode of care, but the cluster and cluster provider can still be identified for the episode of interest.
Using episode clusters for attribution involves the following steps:
-- For each qualified episode, sum the number of clusters "owned" by each clinician. The detail output file from ETG can be used for this purpose. For each service that can be assigned to an episode, the detail file identifies a unique cluster number and a cluster provider ID (same as the servicing provider ID for the cluster anchor record). Using this file, the unique cluster providers for an episode and the number of clusters each provider owns can be identified.

-- Identify those physicians with episode clusters (if any) that are also included in the peer group being measured. Disregard any episodes without one or more cluster providers from that peer group;

-- Identify the peer group physician with the greatest number of episode clusters. If two or more providers are found to have the most clusters, apply an appropriate "tie-breaker" to determine the winning provider (discussed below).

-- For each peer group physician, compute their number of clusters, as a percentage of clusters for all clinicians for the episode and also as a percentage of all clusters for all physicians in that peer group. These amounts can be used to

compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).
After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest number of clusters is the responsible provider for that peer group.

Approach 3 - Physician Episode Attribution using Non-Acute Evaluation and Management (E/M) Visits. This attribution approach identifies the responsible physician for an episode as that physician providing the greatest number of non-acute E/M visits within the episode.
Non-Acute E/M services include office visits and consultations and other E/M services that occur outside of an acute setting where a provider is managing patients and their care. For example, these services exclude initial and subsequent inpatient visits, inpatient consultations, ER visits and critical care visits. It includes office visits and consults, home visits, SNF visits, psychiatric evaluations and therapy and preventive services.
The clinical nature of these services makes them a logical candidate as an activity measure for episode attribution. In particular, these services represent encounters where decisions regarding the course of care and management of an episode take place. This subset of services will be narrower than that described by episode clusters.
Using non-acute E/M visits for attribution involves the following steps:
-- For each qualified episode, sum the number of non-acute E/M visits (visits) rendered by each clinician during the episode.

-- Identify those physicians with these visits (if any) that are also included in the peer group being measured. Disregard any episodes without one or more visit providers from that peer group;

-- Identify the peer group physician with the greatest number of visits. If two or more providers are found to have the most visits, apply an appropriate "tie-breaker" to determine the winning provider (discussed below).

-- For each peer group physician, compute their number of visits, as a percentage of visits for all clinicians for the episode and also as a percentage of all visits for peer group physicians. These amounts can then be used to compare against percentage thresholds to determine the degree to which a provider is "dominant" within an episode (discussed below).
After application of appropriate tie-breaker and threshold comparisons, the peer group physician with greatest number of visits is the responsible provider for that episode for that peer group.

Approach 4 - Physician Episode Attribution using a Primary Care, Population-based Approach. As noted above, a "population" or "panel" based approach is sometimes used when measuring performance for peer groups comprised of primary care physicians. In particular, this approach is often considered where the PCPs are performing a gatekeeper function for a population of members. In this case, responsibility for a member's qualified episodes of care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during those episodes.
This approach requires two important steps:
-- Identification of a PCP for each member. This identification can often be obtained from the member's eligibility record which can include a notation of their assigned PCP for a period of time. Alternatively, a PCP can be "imputed" for a member based on that primary care specialist providing the greatest number of services or service costs for selected primary care. When imputing, the list of eligible providers is typically limited to those physicians involved in primary care. Using either approach, a member is linked to a PCP for a defined period of time.

-- For each qualified episode, identify the patient's assigned PCP during the episode period. Most users of this approach will select the member's assigned PCP at the beginning or ending date of the episode (episode begin and end date is available as part of the standard ETG output).
Using this approach, the peer group physician would be assigned all qualified episodes where they were determined to be the patient's PCP during the defined time period.

Physician Episode Attribution – Other Issues. Some general issues around episode attribution remain. The first involves tie-breakers. When using activity-based attribution for some episodes, two or more providers may have the same amount of costs, clusters or visits. In this case, a tie-breaker is often applied to determine the responsible physician for the episode. Useful candidates for this purpose are the alternative activity measures described here. For example, if two physicians own the same number of clusters within an episode, the physician with the greatest amount

of professional services costs could be selected. If a tie still remains, the physician with the greatest number of visits could be chosen, and so on.
A second issue involves setting appropriate thresholds to determine sufficient activity. As noted above, most activity-based attribution approaches involve some screening of the winning provider to ensure that they owned sufficient activity relative to their peers and to other providers during the course of the episode. This is typically done using two threshold comparisons – a provider's percentage of the total activity of peers and a provider's percentage of the total activity described by all clinicians for the episode. This percentage is then compared to a predefined threshold(s). For the physician with the greatest activity, if their percentages exceed both of these thresholds, they are determined to be responsible for the episode.
As an example, for an episode with 10 clusters, Dr. Jones is responsible for 2 of the 10 clusters and 8 other physicians are responsible for 1 cluster each. Even though Dr. Jones has the most clusters, he still may not be assigned the episode because his involvement was very small.
Most users set these thresholds at 25 or 30 percent. For example, the winning provider must own 25% or more of all of the episode clusters owned by peers and 25% or more of all episode clusters owned by all clinicians.
As a final point, it is useful to summarize the issues around allowing an episode to be attributed to multiple providers. As noted above, many ETG users who employ episode results to support physician measurement perform attribution separately for each specialty peer group of interest, including primary care. In doing this, they select a single winner, if possible, for each peer group in which the episode is relevant, but allow providers in different peer groups to be assigned the same episode, if attribution requirements are met.
In this way, it is theoretically possible to assign more than one physician to an episode if each peer group is considered separately. Users typically do not assign two physicians from the same peer group to the same episode.
To support multiple attribution across peer groups, users would repeat the attribution step selected from above separately for each peer group. Those physicians both meeting the dominant provider status for their peer group and also exceeding the threshold requirements could be responsible for the episode.

S11.2.Identify and define peer group
Identify the peer group and detail how peer group is identified and provide rationale for this methodology

Guidelines : Peer groups define the group of physicians being compared. For example, a common practice in physician episode measurement is to assess the actual costs for those episodes attributed to an individual physician or practice and compare actual costs to peer results, risk adjusted to support more valid comparisons. The peer values use in these comparisons will be influenced by the selection of providers included in the peer group.

In defining a peer group for cost of care measurement, most organizations will include physicians from the same specialty or area of expertise. For organizations with a network covering broad geographic area, some distinction by provider geography can also be used. Internal medicine, cardiology, or general surgery within a certain geographic area are examples of a peer group. Although not directly related to defining a group of providers as peers, many organizations provide separate measurements by line of business, separating results and peer comparisons by commercial, Medicare and Medicaid products.

S11.3. Level of Analysis:

Clinician : Group/Practice
Clinician : Individual
Clinician : Team
Facility
Health Plan
Integrated Delivery System
Population : Community
Population : County or City
Population : National
Population : Regional
Population : states

S11.4.Detail measure outliers or thresholds
Detail any threshold or outlier rules and decisions based on measure resource use and provide rationale for this methodology

Guidelines : Outlier episodes – as a guideline, low outlier cost episodes should be excluded from resource use measurement. High outlier cost episodes should be included, but all costs truncated at the high outlier cost threshold used for the episode (a technique called "winsorization"). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier episode.

S11.5.Detail sample size requirements
Detail the sample size requirement including rules associated with the type of measure

Guidelines : The choice of sample size is less important using techniques that include statistical methods that find only statistically significant difference. If your choice of sample size is low, you will not find many cases that are statistically significantly different. A sample size of 30 is chosen because this is when the normal distribution is a good approximation of the student's t distribution. However, the choice of sample size is less critical when using tests of statistical significance.

S11.6.Define benchmarking or comparative estimates
Detail steps to produce benchmarking and comparative estimates and provide rationale for this methodology

Guidelines : The response to section S10.1 includes examples on how to compare the results for a physician with that of their peers or with external best practice benchmarks. As a guideline, in making comparative estimates, the following considerations should be made:
-- As described in S10.1, comparative results should be risk adjusted to support more valid comparisons;

-- Differences in fee schedules and contracts – for some comparisons using cost of care, differences between actual practice and the benchmark can be influenced by different unit pricing assumptions. In these cases standard pricing or general adjustments to cost levels can be made; and

--Practice styles and service utilization can differ between geographic areas and also between physicians in different specialties. Although comparisons across areas and specialties can provide insights, proper care should be taken in interpreting and communicating results.

S12.Type of Score:

Continuous variable
Count
Rate/Proportion
Ratio

If available, please provide a sample report:

S12_sample_score_report_EPI-634387179570375576.pdf

S12.1. Interpretation of Score.
(Classifies interpretation of score (s) according to whether higher or lower resource use amounts is associated with a higher or lower score, a score falling within a defined interval, or a passing score, etc)

The measures described in this submission include continuous cost measures, counts of utilization, rates and proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons.

For the continuous cost per episode measures (also a rate), an increase in costs can be interpreted as an increase in the resources used to diagnose, manage and treat the episodes in question. This score provides a representation of the weighted utilization expended, where the weights are based on the cost assigned to each individual service.

For the counts of utilization measures per 1,000 episodes (also a rate), an increase in utilization can be interpreted as an increase in the resources used to diagnose, manage and treat the episodes in question. This score provides a

representation of un-weighted utilization. Counts of utilization measures are most useful when the services being aggregated are similar (e.g., inpatient admits, E&M visits, MRI services).

The risk adjusted observed to expected cost or utilization ratio (O/E ratio) includes three important steps:
-- Compute the observed experience for the provider being measured, across all episodes to be included in the comparison;

-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peers benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed;

-- Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The O/E ratio (relative resource use ratio) can be interpreted based on its magnitude and relationship to a peer average or other guidelines. A relative cost ratio less than 1.00 indicates that the observed resource use per episode for a provider is less than his peers. A relative cost ratio greater than 1.00 indicates that the observed resource use per episode for a provider is greater than his risk adjusted peers.

S12.2. Detail Score Estimation
Detail steps to estimate measure score.

The measures described in this submission include continuous cost measures, counts of utilization, rates and proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons. The continuous cost measures, counts of utilization, and rates per episode are described in detail in S9.5. The details involved in computing the O/E ratio measure is provided in S10.1.

S12.3. Describe discriminating results approach
Detail methods for discriminating differences (reporting with descriptive statistics--e.g., distribution, confidence intervals)

In all of these measures we end up with an O/E ratio for a provider. In order to determine the statistical accuracy of this measure we start by measuring the variance of this metric:
Var(O/E)
The Variance of this metric has been estimated by the following expression in a number of journal articles :
Var(O/E)=(Sum(Var(Oi))/[Sum(Ei)]2
Where Var(Oi) is the variance for each of the physician's episodes across all episodes in it's statistical unit for the peer group.
Then the standard error (SE) for this measurement is Sqrt(Var(O/E).
Finally, a 95% confidence interval could be calculated by:
(O/E-1.96*SE, O/E+1.96*SE)
Alternatively, a 90% confidence interval could be calculated by: (O/E-1.64*SE, O/E+1.64*SE)

Adams et al. BMC Health Services Research 2010, 10:57 http://www.biomedcentral.com/1472-6963/10/57

TESTING/ANALYSIS	
Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. See guidance on measure testing.	**Eval Rating**
TESTING ATTACHMENT (5MB or less) or URL: ***If needed, attach supplemental documentation (Save file as: SA_Reliability_Validity Testing) All***	

fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.

URL:
Please supply the username and password:
Attachment: SA_Reliability_Validity Testing_Diabetes.xls

SA1. Reliability Testing
For each module tested or for the overall measure score:

SA1.1. Data/sample
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Data used to support validity testing is based upon a National Commercial member health care services benchmark database representing more than 25 million covered lives for calendar year 2009. Various permutations of the 25 million unique members are pulled to support testing initiatives, for example:
-4 million member sample used for face validity evaluation of ETG processing
-7 million member sample used for reliability evaluation of ETG processing and associated Resource Utilization measures
-75,000 member sample, with manipulated data for content validation testing of ETG processing and associated Resource Utilization measures

SA1.2. Analytic Methods
(Describe method of reliability testing and rationale)

Reliability refers to the consistency of a measure. A measure is considered reliable when the same result is produced repeatedly. Reliability of ETGs and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of a benchmark database of member and health care services covering more than 25 million lives as described in SA1.1.

The second level of internal consistency reliability involves detailed parallel processing comparisons between ETG and Resource Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios.

SA1.3.Testing Results
(reliability statistics, assessment of adequacy in the context of norms for the test conducted)

The extensive testing of ETG produces volumes of results across the test cases and other concepts described above. In terms of validity and assessing the reliability of the implementation, testing of the measurement software with the parallel SAS prototype involves iterations until a high degree of matching of results is observed (over 99.9%). The statistic used in this testing is the exact match of the grouping of records and assignment of resource measures. The difference in the result for each measure between the methodology and prototype is calculated and differences equal to zero are considered an exact match.

In terms of testing of measures across organizations, the following results provide examples of consistency for the submitted measures. These data were not standard priced, so some observed variation is the result of differences in fee schedules and contracts between the organizations. A table, "Reliability Across HCOs" is included in the attachment for SA (SA_Reliability_Validity Testing). The table shows measures of resource use for nine healthcare organizations

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(HCOs) (columns) with a separate comparison provided for selected resource use measures included with this submission. (The 7 million member sample from 9 health care organizations used for reliability assessment described in SA1.1). The results include combined findings across all severity levels for the base condition, with results risk adjusted to reflect the same mix of episodes by severity level across each organization. Separate results are shown for relevant peer groupings (e.g., internal medicine, cardiology). These peer group results are based on episode attributed to each provider, with the estimates describing the peer level findings across all physicians and episodes included in the measurement. As shown, the results suggest a level of consistency across health plans implying reliability in both the measure specification and how it can be applied to different organizations.

A further assessment of reliability and face validity can be made using measure results attributed to physicians in different specialties. The tables, "Results Across PeerGrps, Cost" and "Results Across PeerGrps, Utils" included in the attachment for SA (SA_Reliability_Validity Testing). Provide a comparison of the cost and use per episode for episodes attributed to different specialties. The tables also show results by episode severity level, supporting an assessment of how cost and use measure results vary as severity level increases. The results also show a strong relationship between episode severity and resource use.

SA1.4.Finding statement(s)—*(i.e., is the measure deemed reliable, limitations identified)*

As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies.

SA2.Validity Testing
For each module tested or for the overall measure score:

SA2.1. Data/Sample
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Different samples of data are used in testing ETG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-4 million member sample used for validity and reliability of the ETG methodology and the software used for ETG processing;
-250,000 member sample, with manipulated data for content validation testing of the post-ETG processing associated with Resource Utilization measures (measures described in S9.5);
-7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA2.2.Analytic Method
(Describe method of validity testing and rationale; if face validity, describe systematic assessment)

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Also, please see our responses to SA1 which relate to both reliability and validity.
Validity determines if the output of the measure is accurate. The measure must be valid in order for the results to be accurately applied and interpreted. Validity of a measure is not determined by a single statistic, but by evaluating the complete result of the measures and demonstrating the relationship between the result and the intended purpose of the measure. Validity of ETGs and Resource Use Utilization Measures are judged based upon both content validity and face validity.

Content validation testing involves detailed parallel processing comparisons between ETG and Resource Use Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to

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releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing valid results using a variety of processing configuration options and data input scenarios.

The face validity approach assesses if the measure result is reasonable and functioning according to expectations. This form of validation is most typically performed when modifications to the methodology intentionally change the result of the measure. When this occurs a pre- and post-modification parallel run is created and changes in the measure output are validated for accuracy at face value. Episodes are evaluated for validity in terms of distribution of ETGs, Episode Types, Record Types, Outlier Status and Type of Service. Resource Utilization Measures are evaluated for validity in terms of measure Cost per Episode by Peer Group as well as overall evaluation of the utilization measures by Peer Group.

SA2.3.Testing Results
(statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment)

Please see our responses to SA1 which relate to both reliability and validity.

SA2.4. Finding statement(s)—(*i.e., is the measure deemed reliable, limitations identified)*

Please see our responses to SA1 which relate to both reliability and validity.

SA3.Testing for Measure Exclusions

SA3.1. Describe how the impact of exclusions (if specified) is transparent as required in the criteria

ETG includes logic to identify high or low cost outliers at the episode level. In particular, ETG has a comprehensive method for identifying outlier episodes where the resource cost is high or low enough relative to norms for the clinical condition to distort the results. A table of thresholds, or "trim points", is used to describe levels of costs considered extremely high or low relative to the norm. Specific trim points are defined for each base condition (e.g., Diabetes) and also for each level of severity and the presence of surgical treatments. These values have been determined using a benchmark database describing the experience of more than 25 million covered lives. Note that severity of illness and treatment indicators are assigned as described in the general methodology paper on ETG included in the response to S2. Low and high outlier episodes are noted by ETG.

As described in the general methodology paper on ETG (included in the response to S2), ETG considers an episode incomplete if the clean period of the episode overlaps with the boundaries of the overall time period being used for measurement (e.g., calendar years 2009 and 2010) or the member's eligibility start and end dates. Incomplete episodes may have either an unknown start or an unknown finish. ETG clean periods are described in detail in the general methodology paper on ETG (see S2 response). To summarize, clean periods describe the amount time before and after an episode where clinical activity related to the episode is assessed to determine episode completeness. If no relevant clinical activity is observed and the clean period does not overlap with the overall analytic time period begin and end dates or the member's eligibility begin and end dates, the episode can be considered complete. Different rules are applied to acute and chronic episode conditions to do this. Complete and incomplete episode status and type are noted by ETG.

It is recommended that incomplete episodes be excluded from resource use measurement and comparisons. It is recommended that low outlier cost episodes be excluded from resource use measurement. It is recommended that high outlier cost episodes be included in resource use measurement, but truncated at the high outlier trim point.

In terms of resource use measure construction following ETG grouping, no additional data inclusion or exclusion are applied. Only condition episodes are included in the measurement of episode-based resource use for that condition, including the individual services that ETG groups to those episodes. As noted, it is recommended that incomplete episodes be excluded from resource measurement and outlier episodes be treated as described above.

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SA3.2. Data/sample for analysis of exclusions
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

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Different samples of data are used in testing ETG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-4 million member sample used for validity and reliability of the ETG methodology and the software used for ETG processing;
-250,000 member sample, with manipulated data for content validation testing of the post-ETG processing associated with Resource Utilization measures (measures described in S9.5);
-7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA3.3. Analytic Method
(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference)

Reliability and testing of exclusions for ETGs and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of the benchmark described above in SA2.1.

The second level of internal consistency reliability for exclusions involves detailed parallel processing comparisons between ETG and Resource Use Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios.

As an example, the text below provides the Table of Contents for an ETG testing plan for ETG Version 7.0. The plan includes processes around data used, test cases created, comparison of software results with those produced by a SAS prototype (to determine matching across parallel implementations of the methodology), and a review by clinical analysts to assess face validity. A similar testing approach is used for the resource use measures that are processed following ETG grouping. Note that steps 2.4 and 2.5 relate to exclusions around episode completeness and outlier status.

ETG TEST PLAN DOCUMENT – EXAMPLE TABLE OF CONTENTS
SECTION 1—OVERVIEW
1.1 PURPOSE OF TEST PLAN DOCUMENT
1.2 TESTING APPROACH AND DELIVERABLES
1.3 SCOPE OF TESTING
1.4 DATA
1.5 ETG GROUPER
SECTION 2—BENCHMARK TEST CASES
2.1 ACCOUNTING OF GROUPED VS. UNGROUPED RECORDS
2.2 DISTRIBUTION BY ETG
2.3 DISTRIBUTION BY MPC
2.4 DISTRIBUTION BY EPISODE COMPLETENESS
2.5 DISTRIBUTION BY OUTLIERS
2.6 EPISODE AGE/GENDER PROFILE
SECTION 3—FEATURE-RELATED TEST CASES
3.1 COMPARISON OF SOFTWARE TO PROTOTYPE
3.2 SEVERITY ADJUSTMENT

3.3 COMPLICATIONS 3.4 COMORBIDITIES 3.5 TREATMENT INDICATORS 3.6 EPISODE INDICATORS SECTION 4—REVISION HISTORY Finally, the results are applied to the healthcare data of different organizations to assess both the ability of the organization's data to support the measurements and also the consistency of results across the organizations. This assessment of reliability also provides evidence that the measures are being applied in a consistent and valid way. **SA3.4. Results** ***(statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses)*** See Attachment SA_Reliability_Validity Testing for a comparison of episode outlier and completion results across sources of data from ETG processing. **SA3.5. Finding statement(s)-- *(i.e., is the measure deemed reliable, limitations identified)*** As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies. This statement applies to all methodologies involved, including exclusions. **SA4. Testing Population** ***Which populations were included in the testing data? (Check all that apply)*** Commercial	
SA5. Risk adjustment strategy ***Refer to items S10.1 and S10.2 to rate this criterion.***	**2b4** **H☐** **M☐** **L☐** **I☐**
SA6. Data analysis and scoring methods ***Refer to items S12-S12.3 to rate this criterion.***	**2b5** **H☐** **M☐** **L☐** **I☐**
SA7. Multiple data sources ***Refer to S7 & all SA1 items to evaluate this criterion.***	**2b6** **H☐** **M☐** **L☐** **I☐** **NA☐**
SA6. Stratification of Disparities (if applicable) ***Refer to item S10.2 to rate this criterion.***	**2c** **H☐** **M☐** **L☐** **I☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties*?	

Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, met? **Rationale:**	**Y☐** **N☐**
USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.	**Eval Rating**
Meaningful, Understandable, and Useful Information **U1. Current Use:** Internal quality improvement Payment Public reporting (disclosure to performance results to the public at large) Quality improvement with external benchmarking **U1.1. Use in Public Reporting Initiative Use in Public Reporting.** ***Disclosure of performance results to the public at large (If used in a public reporting program, provide name of program(s), locations, Web page URL(s). If not publicly reported in a national or community program, state the plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement)*** Several users of ETGs and Resource Use Measures rely on the analysis to support Public Reporting initiatives. Examples include: -- Health Care Organization #1: Measuring Provider Efficiency -- HCO #1 ranks providers based on efficiency by ETG using a single provider ETG overview. Using COGNOS reporting capabilities the organization is able to drill down into procedure and drug level comparisons. -- Health Care Organization #2: Corporate Wellness Programs -- HCO #2 uses ETG output to analyze utilization patterns and identify potential diseases and populations to target for intervention. ERGs are used to adjust the average and comparison population expenditures and Specialty profiles are created using both ETG and ERG results. ERG scores are used to identify patients who could be potential high utilizers. -- Health Care Organization #3: Physician Profiling and Clinical Benchmarking -- HCO #3 has embarked upon an initiative to use ETG information for clinical reporting and benchmarking. ERG output complements the ETG information for underwriting and physician profiling programs as well. -- Health Care Organization #4: Provider Specialty Profiling and Predictive Modeling --HCO #4 utilizes Resource Use Measures and ETG to identify variations in practice patterns, measure performance and examine utilization and disease management. The primary focus is on high cost specialties and ETGs are used to identify the top 5 conditions to support specialty profiles and cost comparisons and drill downs. ERG scores are used to risk adjust PCP profiles to adjust for patient severity. Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request. **U1.2. Use in QI** ***(If used in improvement programs, provide name of program(s), locations, Web page URL(s)).*** Examples of ETGs and Resource Use Measures in action within health care industry quality improvement initiatives include: -- Health Care Organization #5: Internal Quality Improvement – Disease Management --HCO #5 utilizes 30 months of medical and pharmacy data totaling more than 17 million claim lines to support identification of member risk and stratification of members for care management teams. ETG and ERG groupers are embedded within their claims datamart with other sources of data and support the identification of clinical care gaps and impactable dollars for quality improvement. -- Health Care Organization #6: Employer Group Utilization Reports to Identify Provider Variance --HCO #6 generates Employer or Account Group Utilization Reports which includes a global view of ETGs for the	**3a** **H☐** **M☐** **L☐** **I☐**

population. These reports are used to identify the top 5 ETGs where variance is the greatest to target specific procedures for a particular ETG in order to improve quality for the Employer group. -- Health Care Organization #7: Cesarean Section Study --HCO #7 conducted a study on Cesarean Section, Infertility and multiple births using ETGs. Providers with high rates of Cesarean Section were identified and compared based upon severity indices. The study determined that multiple births were a significant contributor to a market's cost and procedure variances. The study further identified infertility treatment specialists who need improvement based upon the comparison to their peers of best practices and procedures. Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request. **U1.3. Use for other Accountability Functions (payment, certification, accreditation)** ***(If used in a public accountability program, provide name of program(s), locations, Web page URL(s).*** Other examples of industry use of ETGs and Resource Use Measures include Provider Pay for Excellence programs and Member Cost Analysis Tools. Specific examples include: -- Health Care Organization #8: Provider Analytics Team --HCO #8 leverages the power of ETGs and Resource Use Measures to support their internal Provider Analytics team. This team manages the Provider Profiling program to support the Medical Directors' high-level physician review and network physician meetings as well as bi-annual provider profiling reports. In addition to provider profiling the Provider Analytics team uses ETG and Resource Use Measures to Impute PCP information to identify gaps in care, support physician group award programs and Patient Centered Medical Home projects. --Health Care Organization #9: Member Cost Analysis Tools --HCO #9 has created a patient website with cost calculation tools to provide detailed treatment costs for the patient based upon ETG analysis. The website includes tips on how to reduce costs as well as a pharmacy co-pay calculator. Users may access median cost reports for an ETG as well as cost ranges for procedures based upon CPT codes, pharmaceuticals and office visits. The website also provides comparison data for providers based upon performance indices. Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request	
U2. Testing of Interpretability ***(Provide a rationale for why the measure performance results are meaningful, understandable, and useful to the intended audience(s) for both public reporting and quality improvement).*** **U2.1. If understanding or usefulness was demonstrated** ***(e.g., through systematic feedback from users, focus group, cognitive testing, analysis of quality improvement initiatives) describe the data, methods, and results.*** The assessment of the usability of the results from ETG-based measures of resource use is primarily from two entities: the ETG Medical Advisory Board and the Ingenix User Forums around these measures. The Medical Advisory Board is comprised of medical directors from healthcare organizations that employ episode based measures to assess resource use. Input and feedback from these clinicians inform both the ETG methodology itself and also how it is used in creating and sharing provider measurement results. The Ingenix User Forums include technical experts from organizations that use ETG. Similar to the Medical Advisory Board, input and feedback from this group informs the ETG methodology, but primarily is focused on how ETG results are used to create and share provider measurement results.	**3b** **H☐** **M☐** **L☐** **NA☐**
U2.2. Resource use data and result can be decomposed for transparency and understanding. ***Refer to items S11 -S12.3.***	**3c** **H☐** **M☐** **L☐** **I☐**
U3. If there are similar or related measures (either same measure focus or target population)	

measures (both the same measure focus and same target population), list the NQF # and title of all related and/or similar measures.	**3d**
U3.1. If this measure has EITHER the same measure focus OR the same target population as NQF-endorsed measure(s): Are the measure specifications completely harmonized?	**H☐ M☐ L☐ I☐ NA☐**
U3.2. If the measure specifications are not completely harmonized identify the differences, rationale, and impact on interpretability and data collection burden. ***Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)***	
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?	
Steering Committee: Overall, to what extent was the criterion, *Usability*, met? **Rationale:**	**H☐ M☐ L☐**
FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement.	Eval Rating
F1. Data Elements Generated as Byproduct of Care Processes ***How are the data elements needed to compute measure scores generated? Data used in the measure are:***	**4a**
Generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims)	**H☐ M☐ L☐ I☐**
F2. Electronic Sources ***Are the data elements needed for the measure as specified available electronically? (Elements that are needed to compute measure scores are in defined, computer-readable fields)***	**4b**
ALL data elements in electronic claims	
F2.1. If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.	**H☐ M☐ L☐ I☐**
F3. Susceptibility to Inaccuracies, Errors, or Unintended Consequences ***Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to minimize or prevent. If audited, provide results.***	**4c**
The main source of inaccuracies relate to small sample size. There are lower limits on the number of episodes for a given provider or specialty that are allowed for inclusion in the analysis. Sample sizes that are determined to be too	**H☐ M☐ L☐ I☐**

small are eliminated from the analysis.
These situations will occur infrequently, as the sample sizes that are customarily dealt with are very large. A methodology for applying statistical techniques to determine confidence intervals of the results has been created and can be applied to gauge the accuracy of the analysis. In addition, sample size is less of an issue when multiple episode types are combined for a single metric.

In some cases, there are physicians that are "ultra" specialized that may not have a reasonably sized peer group for comparison. Sub-specialties like hepatology, or muscular dystrophy specialists may fall into this category.) A second source of potential inaccuracies relate to the validity and completeness of the administrative data available to support the measurement. As described in S6.1, a careful evaluation of the data to be used to support the measurement is required and actions taken to address identified issues.

F4. Data Collection Strategy
Describe what you have learned/modified as a result of testing regarding barriers to operational use of the measure (e.g., availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, cost of proprietary measures).

The measure is in use beyond internal QI. Please see the section on Usability.

4d

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TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility*?

Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met?
Rationale:

H☐ M☐ L☐

RECOMMENDATION

Steering Committee: Do you recommend for endorsement?
Comments:

Y☐ N☐ A☐

CONTACT INFORMATION

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Co.6 Additional organizations that sponsored/participated in measure development

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.2 Year the measure was first released:

Ad.3 Month and Year of most recent revision:

Ad.4 What is your frequency for review/update of this measure?

Ad.5 When is the next scheduled review/update for this measure?

Ad.6 Copyright statement/disclaimers:

Ad. 7 Date of Submission (*MM/DD/YY*)**:**

04/18/2011

INGENIX

ETG METHODS DOCUMENT
Building Episodes with Episode Treatment Groups (ETG): General Methodology and Application for DIABETES

This document provides an overview of the Ingenix Episode Treatment Groups (ETG) methodology and its application for creating Diabetes episodes of care. ETG groups individual medical and pharmacy services to unique episodes of care defining a condition for a patient and is used extensively to support episode-based measurement of cost of care. The first section of this document describes the general approach used by ETG. The second section beginning on page 12 summarizes methods for Diabetes.

I. Episode Treatment Groups (ETG) Construction Logic

ETG is an episode grouping methodology that identifies a unique clinical condition for a patient and the services involved in diagnosing, managing and treating that condition. ETG organizes routinely-collected professional, inpatient, outpatient and ancillary services, including pharmaceutical services, into episodes of care. ETG evaluates each claim service record with respect to provider type, procedure and diagnoses codes and other information to assign the record to an appropriate episode. In doing this, all conditions and episodes are considered for a patient, including concurrently occurring conditions.

ETG covers the breadth of clinical medicine. Examples of ETG based conditions include diabetes, asthma and chronic sinusitis. Each episode is further assigned a condition-specific severity level, supporting case-mix adjusted comparisons within and across conditions.

ETG uses as input data information from administrative medical and pharmacy claim service records and encounters describing the individual services provided to a patient. ETG also uses information describing each patient, including age and gender and time enrolled with a health plan or other organization.

The Episode Building Process

The ETG episode building process has four important steps:

1. Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
2. Build Episodes from Anchor Records
3. Group Non-Anchor Records to Episodes
4. Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

Step 1: Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures

Assign record type to each Service

In building an episode the first step involves assigning a Record Type to each service record. The Record Type assigned to a record is determined by the Provider Type, Procedure Code and/or Revenue Code Service, and National Drug Code (NDC) (if any), on the record. Provider Type values are based on

the mapping of individual provider specialties to one of three values recognized by ETG: Clinician, Facility and Other. The Provider Type values and their definitions are as follows:

Provider Type	Definition
Clinician	Providers who make diagnoses and recommend treatment
Facility	Acute and long term care providers such as short-term hospitals, skilled nursing facilities, and psychiatric or chemical dependency facilities
Other/Non-Clinician	All other healthcare providers

Identify Anchor Records

Service records containing a NDC code are assigned a Pharmacy Record Type. For other services, ETG assigns one of the following Record Types to the service record using Provider Type and the procedure/revenue code and also determines if that Record Type can anchor (begin or continue) an episode. The following table describes the Record Type and Anchor relationship:

Record Type	Record Type Value	Anchor or Non-Anchor
Management	A record submitted by a clinician for services related to the evaluation of a patient's condition.	Anchor
Surgery	A record submitted by a clinician for surgical or related procedures.	Anchor
Ancillary	A record submitted by any provider for laboratory, radiological or similar services.	Non-Anchor
Facility	A record submitted by a treatment facility for room & board services.	Anchor
Pharmacy	A record for a prescription drug service.	Non-Anchor

Most management records contain evaluation and management CPT-4 codes. Surgery records are primarily procedural CPT-4 codes. Facility records are room and board revenue codes billed by a facility (also referred to as a confinement). Pharmacy records are claims containing a NDC or certain HCPCS codes related to the administration of a drug. Record Types of management, surgery and facility are considered *anchor* records. The identification of an anchor record is significant because it indicates that a clinician has evaluated a patient, and has decided on the types of services required to further identify and treat the patient's condition. Non-anchor records describe *ancillary* services that aid in evaluating and treating the patient, such as x-rays and laboratory services.

Assign Diagnoses to Diagnosis Class

The way in which records are grouped to an episode is governed mainly by the diagnosis, revenue, and procedure codes on the service record. Each ICD-9-CM, CPT-4/HCPCS, and revenue code has been mapped to ETG concepts through extensively vetted and continually updated clinical tables. (ICD-9 procedure codes are not used in grouping.)

Diagnosis Codes

The software relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG.

- Sign and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition.

The software runs one member at a time and processes the anchor records with a 365-day moving window. The diagnosis codes are grouped in several distinct passes. This is done so that the grouper processes the more specific codes first, leaving the sign & symptom codes until later, when it is more likely that there is a more specific episode for these claims to join.

Each diagnosis code is matched with one or more ETGs through a diagnosis eligibility table. The exception is 'E' codes which are not grouped. Each diagnosis code is further ranked, based on its strength of association with the ETG. The rank values are as follows: low, medium, high and primary. Low, medium, and high represent the strength of the match association. A primary rank describes conditions that define a disease and are the main codes that impact grouping decisions. The grouper first processes the specific and non-specific diagnosis codes so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to.

Identify the Clinical Relationship Between Diagnosis Codes and Conditions

Match each diagnosis code with one or more conditions (ETGs) through a diagnosis eligibility table. In addition to mapping diagnosis codes to conditions, each diagnosis code is further ranked, based on its strength of association with a condition. A rank of "primary" or "incidental" is assigned to each diagnosis and condition combination, with a further ranking assigned to incidental relationships:

- Primary: A "primary" diagnosis/condition relationship is assigned in a map where the diagnosis defines that condition. (Note: the word "primary" here is used to describe the relationship between a diagnosis and an episode, it is not used to indicate the position of the diagnosis code on the claim line. The diagnosis in any position on the claim line can have a primary relationship with an ETG). This map is used to identify primary diagnoses for the ETG. Primary diagnosis codes can only be ranked as primary for a single ETG condition.

- Incidental: These diagnosis codes are eligible for a condition but are not classified as primary. These diagnosis codes can be incidental to other conditions. To support the linkage of these diagnosis codes to a final episode, a further ranking is assigned for each condition based on the relative strength of association between the diagnosis and condition. Values of low, medium, or high are assigned for each diagnosis/condition.

Identify Relationships between Procedure Codes and Conditions

In building episodes, the procedure or revenue code can help to identify the ETG to which a particular claim record can be assigned. A given procedure may be valid for several ETGs, though not equally so. A procedure eligibility table therefore ranks the valid ETGs for each procedure to give a better sense of how closely related the service is to each ETG. The ranking options are: Very Low, Low, Medium, and High, with High being the strongest rank.

The following table provides an example of a rhinoplasty surgical procedure and selected ETGs it is eligible for and the rank for each ETG.

ETG	Rank
Trauma to ear/nose/throat	High
Other inflammatory conditions of ear/nose/throat	High
Allergic rhinitis	Medium
Chronic sinusitis	Medium
Trauma of oral cavity	Medium
Open fracture or dislocation - head & face	Medium
Congenital & acquired anomalies of ear/nose/throat	Medium
Closed fracture or dislocation – head & face	Low

Cocaine or amphetamine dependence	Very Low
Other disorders of ear/nose/throat	Very Low

For a record to be eligible to start or join an episode, the diagnosis code and the procedure/revenue code must both be eligible for an ETG. Where an anchor record can be assigned to more than one observed episode for a patent, the record is assigned to an episode according to the best combination of the procedure/revenue code and the diagnosis code.

- ❖ The ETG Online Clinical Knowledge Base application on the Ingenix website (www.ingenix.com/transparency) provides more information about the diagnosis and procedure associations to an ETG.

Identify Relationships Between Pharmacy Services and Conditions

The relationship between pharmacy services and episodes is based on the pharmacy code assigned to the service in a mapping. To support this assessment, the ETG methodology assigns each pharmacy service to a Drug Category Code (DCC). The DCC describes the drug's active ingredients and route of administration. DCCs are then mapped to ETGs and define the relationships between a drug and a condition. Most pharmacy services are defined using NDC procedure codes, however selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC by ETG (e.g., J-codes describing injections).

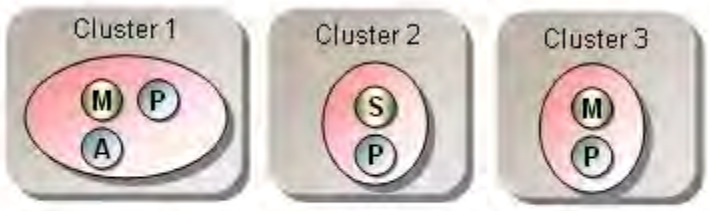
Step 2: Build Episodes from Anchor Records

Only anchor records can start or continue an episode.

Anchor records can do the following:

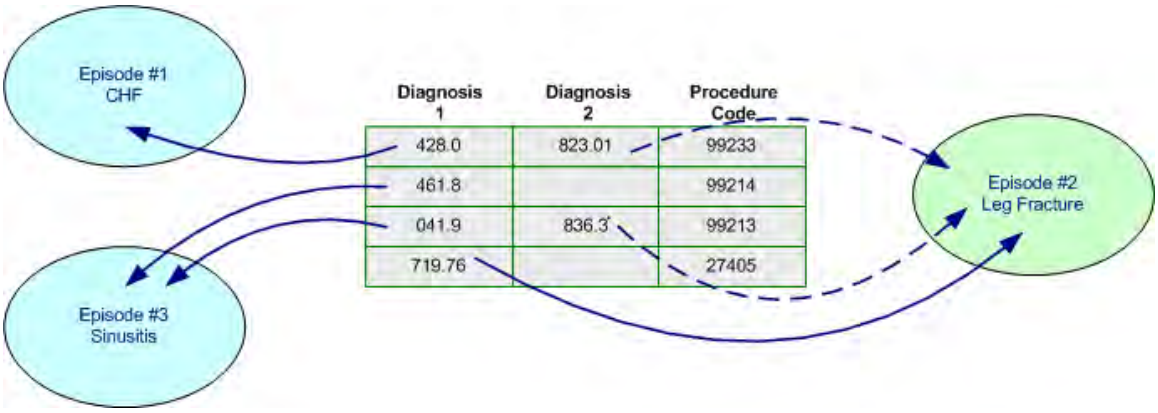
- Begin a *cluster* that can open a new episode or join an existing episode
- Extend an episode (time-wise) – providing evidence that the episode has not yet completed
- Create one or more or *phantom* clusters – when there are multiple diagnosis codes on the same anchor record
- Determine if episodes incur complications, comorbidities and significant surgery/treatment

Each anchor record forms a cluster. A cluster is the basic unit of an episode. Each cluster is comprised of an anchor record and zero, one, or more ancillary and pharmacy records. Each episode consists of one or more clusters. The illustration below demonstrates this concept, showing management (M), ancillary (A) and pharmacy (P) records within clusters.



Clusters: Real and Phantom

Once the anchor record has been assigned to an episode using a diagnosis, the remaining diagnosis codes on the record, if any, are examined. If a remaining diagnosis would more appropriately belong to a different episode than the episode the anchor record is assigned to, the software starts a phantom cluster for a new episode. At this point, phantom clusters are episodes created that will not have any costs assigned to them. Subsequent service records for a patient will now have available additional episodes for potential grouping, so the software will be able to assign these subsequent services more accurately than it would without using phantoms. This allows the diagnostic information to be utilized fully to identify and track all of the conditions for which the member is being treated, yet still assign records to only one episode. The diagram below provides an illustration. The dotted line indicates a phantom episode was started, a straight line indicates a real episode was started. In the case of diagnosis code 719.76, it joined episode #2 which originated as a phantom episode, thereby converting it to a real episode.

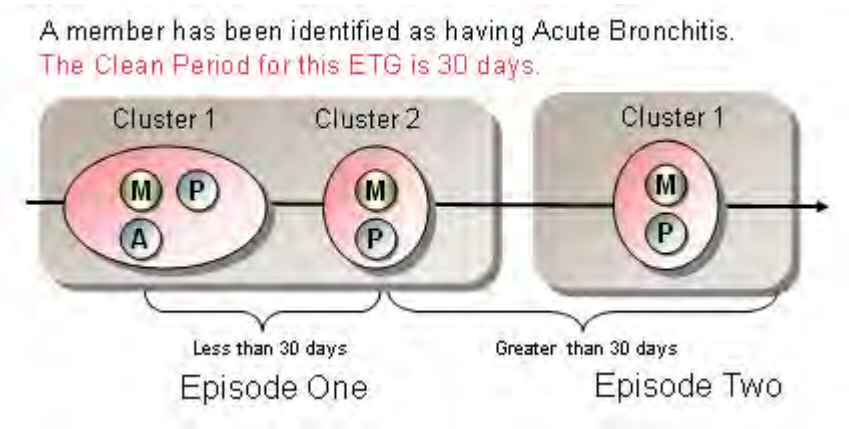


Time Windows: Clean Periods and Member Eligibility

Along with the clinical aspects of starting and grouping records to an episode, the method of episode completion is a crucial feature of ETG. The approach taken for the identification of a complete episode relies on a flexible, rather than a fixed length of time. There are no standard definitions of an episode's chronological length. The episode grouper continues to identify and track all clinical activity for an episode for as long as a condition is actively treated – a concept described as discrete dynamic clean periods. A clean period is defined as the absence of treatment for a specified period of time. Each ETG has its own unique clean period. For an acute condition the concept of a clean period is of most importance. For example, the clean period for Acute Bronchitis is 30 days. Once an episode has started for this ETG, anchor records clinically consistent for acute bronchitis group to this episode until such time as 30 days passes without any corresponding clinically consistent treatment. For Chronic Bronchitis, the clean period is 180 days, consistent with a more chronic illness. In some obvious instances, e.g. benign hypertension or diabetes, there is no clean period. The condition is basically life-long (chronic) and all clinically consistent treatments group to an episode of benign hypertension for as long as data are available.

The clean period window is dynamic in that each new anchor record that joins an episode moves the clean period window by extending the episode's dates. In this way, as long as a condition is consistently treated such that the date of each successive anchor record is less than or equal to the clean period date for the ETG, the episode can last forever.

The following diagram provides an illustration of this concept for an acute condition.



In this example, two episodes of **Acute Bronchitis** are created.

- Three office visits occurred for the treatment of acute bronchitis (record type M)
- The time frame between the second office visit and the third office visit was greater than 30 days, the clean period of this ETG. Therefore, a second episode was created for this condition

If the example above had been for a chronic condition, such as benign hypertension, all services would be grouped into a single episode since chronic conditions do not necessarily have an end to their clean period. To allow for analysis on chronic conditions, we offer 5 options for users to parse the episode into annual increments:

1. User chooses any month to begin year long episodes
2. Year long episodes will start from the beginning of the grouped data
3. Year long episodes will start from the member's eligible start date
4. Year long episodes will end at the end of the grouped data
5. Year long episodes will end at the member's eligible end date

Step 3: Group Non-Anchor Records

Non-anchor records represent services that are incidental to the direct evaluation, management and treatment of a patient. There are two types of non-anchor records: pharmacy records and ancillary records (such as laboratory tests, x-rays, and the facility component of ambulatory surgery centers services). Each non-anchor record links to only one cluster and eventually becomes part of the episode that the cluster is finally grouped to.

Ancillary records can do the following:

- Join an episode
- Convert a phantom episode into a real episode

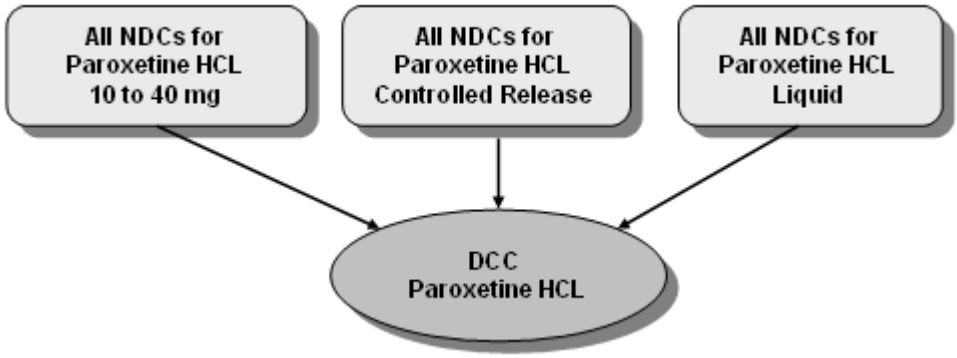
When the grouper assigns an ancillary record to an episode, it uses the ancillary record's diagnosis and procedure/revenue codes. It first evaluates diagnosis codes classified as *specific and nonspecific* to determine if these records can join an episode and then evaluates diagnosis codes classified as *sign and symptoms*. The ancillary record must occur within the clean period time window around an existing episode in order to be eligible to group to an existing episode. An ancillary record cannot extend an episode's length. It can only join an episode.

It is possible for an ancillary claim record to be medically inappropriate for any episode or condition for a member. If an ancillary record is not eligible to join an open episode it is then evaluated to determine if it can be assigned to a preventive ETG (screening and immunizations). If an ancillary record cannot be

assigned to a valid ETG or a preventive ETG, it is identified as an orphan record. An example of this would be when a provider calls in a prescription for the patient rather than seeing the patient in his/her office. The pharmacy claim would not have an anchor record to group to, so it would be considered an orphan.

For drug records, the methodology evaluates each pharmacy record against the episodes for which the patient is being treated. The NDC code assigned to the pharmacy record provides the clinical information to support this evaluation. Just as with the procedure and diagnosis codes, a drug eligibility table identifies ETGs to which an NDC can be associated and the strength of that association (low, medium, high), allowing the grouper to assign the drug claim record to the most clinically appropriate episode. HCPCS Level II procedure codes which represent a drug and its administration (e.g., injectables) are also considered to be pharmacy records, and are grouped in the same way. Due to the large number of NDCs defined for pharmacy services, the ETG methodology uses a drug classification hierarchy to support grouping. Each drug is associated with a Drug Classification Code (DCC) which represents a drug, or a specific dosage form of a drug. For example, the NDCs for all strengths of the antidepressant Paroxetine maps to the DCC of Paroxetine. The DCC concept assigned to the pharmacy services then supports grouping, not the NDC.

The following diagram illustrates this drug hierarchy.



Like ancillary records, drug records cannot extend an episode's length; they can only join an episode. A drug record must occur within an episode's clean period (pre and post) in order to be eligible to group to it.

Step 4: Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

After all claim records have grouped to an episode, the grouper then has all of the information it needs to finalize the episode.

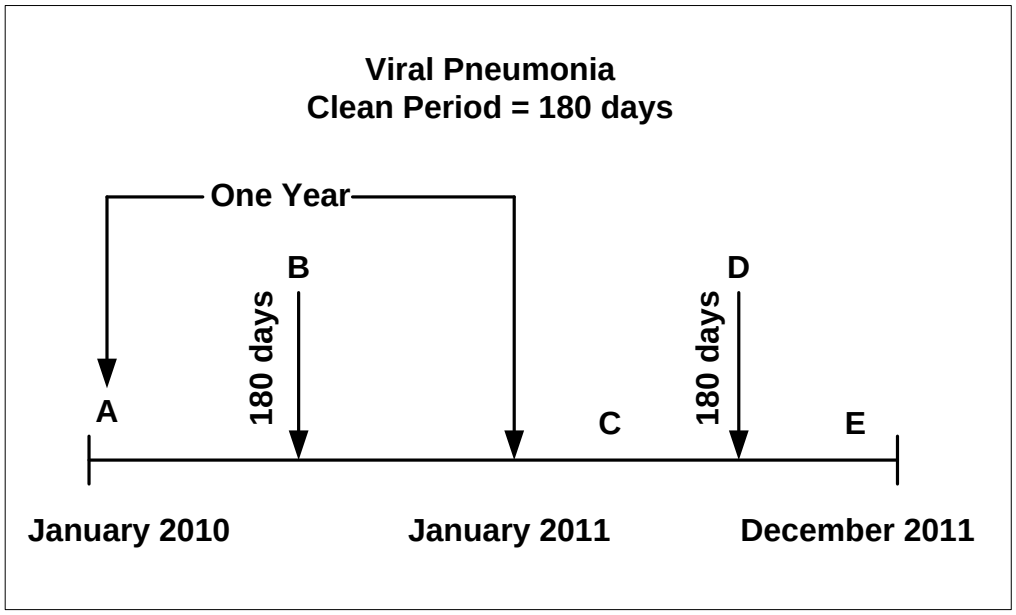
Episode Completeness

The notion of a complete episode is complex in the reality of service data. For example, assume the grouping start date is January 1, 2010. Does an episode for an acute condition with its first anchor record on January 3, 2010 begin with this claim or is the episode in progress? The episode of the acute condition might have begun sometime earlier (prior to January 1, 2010) but the data to identify the exact begin date are not available. The opposite is also true. With data available from January 1, 2009 through December 31, 2010, can it be known if a record incurred on December 21st for an existing episode is the end of the episode? The answer to both questions is that under certain circumstances it cannot be known whether a claim service record is actually the true beginning or the true end of an episode. A distinction must be

made between episodes which are to be considered complete from those whose completeness cannot be determined.

A clean start is defined as a situation where the true beginning date for an episode is known. The ETG methodology identifies a clean start by comparing the incurred date of the first anchor record of an episode with the beginning date of the overall service data range used in the grouping (or a member's beginning eligibility date, if later), with the episode's ETG clean period. If that anchor record date starts after the number of pre-episode clean period days, the episode is considered to have a clean start. If it occurs within the clean period days, it is considered to have an unknown start. The same methodology is true for a clean finish. A clean finish uses the same number of clean period days to determine a known finish. If the last anchor record occurs prior to the clean period days, the episode is determined to have a clean finish. If the last anchor record occurs within the clean period days, it has an unknown finish.

The following diagram illustrates this concept. In this example, anchor records for this episode occur at dates A, B, C, D and E. Note that treatment for this episode spans well over one year.



Assume that the time frame from each anchor record to the next is less than 180 days.

• The anchor record at date A is an unknown start.

• The anchor records at dates B and C (if either were the first anchor records in this episode) represent a clean start.

• The anchor records at dates D and E (if either were the last anchor records in this episode) represent an unknown finish.

The Episode Type identifies the completeness of an episode. Each acute episode is assessed for its status as a full year episode, and if it has a clean start and/or a clean finish. The episode's start and end dates are compared against the clean period days. From this information, the Episode Type can be determined.

The following table identifies the episode type values and whether they are considered complete or incomplete.

Episode Type	Description	Completeness Status
0	Clean start, clean finish	Complete
1	Clean start, unknown finish (full year)	Complete
2	Unknown start, clean finish (full year)	Complete
3	Unknown start, unknown finish (full year)	Complete
4	Clean start, unknown finish	Incomplete
5	Unknown start, clean finish	Incomplete
6	Unknown start, unknown finish	Incomplete
7	Incomplete annual episode	Incomplete

To account for chronic conditions, the ETG methodology utilizes different logic than the clean/unknown starts and finishes approach described above. ETG does this since chronic conditions are life-long going

forward. Further, to support proper episode-to-episode comparisons, the grouper limits the length of each episode for a chronic condition to one year. Such episodes which extend beyond one year and are subsequently limited to one year for analytical purposes are referred to as chronic annual episodes. As mentioned above, the grouper provides different configurable options on how to decide the starting point for chronic episodes: start month (a static month), grouping start date, grouping end date, eligibility start date and eligibility end date.

The grouper uses that selection and looks forward or back 365 days, collects all anchor records within that timeframe and assigns them to an episode. It does this in segments of 365 days. It then collects the non-anchor records and assigns them to the appropriate annual episode. To determine, within an annual year, if a chronic annual episode is considered complete, the grouper determines the member's enrollment during that time span: if the member is eligible for the entire year, that episode is considered complete (episode type 0); if not, the episode is considered incomplete (episode type 7).

The start date and end date for chronic annual episodes is based on the configurable selection made and is a full year date span. It does not reflect the date of the first and last anchor records within the episode, as acute episodes do.

Assign Complications/Condition Status, Comorbidities and Treatments to Episodes

The ETG methodology also identifies complication, comorbidity and treatment factors observed for each episode. After core grouping, episodes are evaluated to determine if they have any complicating factors, if there are any comorbidities associated with the episode's condition, and if the activity within the episode contains any treatment indicators. This information is reflected in the ETG number, allowing one to see specific characteristics of each episode. The first 6 digits are the base class, a unique number identifying the ETG; the 7th, 8th and 9th digits are the flags (with "0" indicating the factor was not observed, and "1" indicating it was) for with or without complication, with or without comorbidity and with or without treatments. The following table provides an illustration of the ETG numbers for Diabetes.

Base ETG	ETG Number	ETG Long Description
163000	163000000	Diabetes, w/o complication, w/o comorbidity, w/o surgery
163000	163000001	Diabetes, w/o complication, w/o comorbidity, with surgery
163000	163000010	Diabetes, w/o complication, with comorbidity, w/o surgery
163000	163000011	Diabetes, w/o complication, with comorbidity, with surgery
163000	163000100	Diabetes, with complication, w/o comorbidity, w/o surgery
163000	163000101	Diabetes, with complication, w/o comorbidity, with surgery
163000	163000110	Diabetes, with complication, with comorbidity, w/o surgery
163000	163000111	Diabetes, with complication, with comorbidity, with surgery

Identifying the condition status/complications for an episode provides specificity of the episode's clinical condition, any complications associated with the episode, and the disease progression, when applicable. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as condition status codes. For example, condition statuses for Diabetes include Diabetes Type 1 and Diabetes Type 2. Examples of condition statuses that specify complications of Diabetes are Diabetic Coma and Diabetic Ketoacidosis.

Condition status codes are identified by diagnosis codes on anchor records, are ETG-specific and must occur within an episode in order for the episode to be designated as *with complication*. For example, the diagnosis of diabetic coma would not be a condition status code for an episode of chronic bronchitis. It would, however, be a condition status code for an episode of diabetes. In addition to flagging the ETG as *with complication*, the grouper provides an optional output that lists each condition status that was identified within an episode.

A comorbidity is defined as the presence of more than one disease or health condition in a member at a given time. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as comorbidity codes. For example, the comorbidity *Chronic bronchitis* is a

compilation of the various diagnosis codes designated as such (e.g. Bronchiectasis, Chronic bronchitis NOS, etc.). The grouper identifies comorbidities by evaluating diagnosis codes on the records designated as anchor records. It keeps track of all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as *with comorbidity*.

Comorbidities are ETG-specific. For example, the comorbidity of Chronic Bronchitis would not be a comorbidity for an episode of Lymphoma. It would, however, be a comorbidity for an episode of Congestive Heart Failure. Any comorbidity that has an active period that occurs during an eligible episode's time frame is considered a comorbidity for that episode.

Treatment indicators are categorizations of services such as defining surgeries and active management procedures for malignant neoplasms (chemotherapy and radiation therapy services). These categories are a grouping of similar procedures. For example, the treatment indicator for Chemotherapy is a compilation of the procedure codes and revenue codes that are classified as chemotherapy services.

When flagging the ETG as *with or without surgery*, the ETG methodology provides more specificity for certain conditions. For malignant neoplasms, the grouper will also designate if an episode incurred active management services. For cardiology conditions, the grouper will also designate if an episode incurred these specific defining surgeries: angioplasty, CABG and valve surgery. The exact nature of the treatment will be specified by the value of the treatment indicator digit. The procedure and/or revenue codes categorized as a treatment indicator must occur within an episode in order for the episode to be flagged as such.

Given the ETG numbering scheme, where the first six digits define the base condition and the remaining digits describe treatment and other clinical factors, users of the ETG outputs have flexibility in how the grouped results are applied. For example, if the desire is to measure at the condition level, episodes are combined for analysis using the first six digits of the ETG number (the first six digits identify the base ETG). If the combination of condition and the presence (or not) of a significant surgery are desired to support comparisons, users would combine episodes using the first six digits and the ninth digit of the ETG number. As described below, severity levels can also be used in addition to support comparisons.

Severity Adjusting Episodes

Complications, comorbidities and member demographics are used in determining the severity of the member's episode. The ETG methodology takes advantage of the relevant complication and comorbidity factors (indicating a sicker member who may require more extensive treatment for a related condition) when determining an episode's severity. The result is a severity score and severity level for episodes. The higher the severity score, the more resources are expected relative to episodes with a lower severity score for the same base ETG.

After condition statuses and comorbidities have been assigned to an episode, the grouper can determine the severity score and severity level for each episode. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for each base ETG where severity is measured. There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights for many conditions.

Based on the severity score, the severity level indicates a ranking of where the specific episode is relative to the population of all episodes within that base ETG. There are four potential severity levels, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. Not all ETGs are severity adjusted and not all ETGs have 4 severity levels. All episodes for ETGs that are not severity adjusted have a severity score of 1.00 and a severity level of 1.

Outlier Status

Outlier status is the comparison of an episode's costs to a dollar amount specified for each ETG. An episode is considered a low outlier if its costs are below the ETG-specific low outlier amount; an episode is considered a high outlier if its costs are above the ETG-specific high outlier amount. The ETG Base Class in combination with the episode's severity level is used to determine the outlier status. All costs within the episode are evaluated (i.e., all record types).

II. ETG Construction Logic for Diabetes Episodes of Care

Episodes for the submitted Diabetes measures are defined using the Episode Treatment Group (ETG) methodology. Section I of this document describes the general approach used by ETG to create episodes of care. This section applies that general methodology to create Diabetes episodes. Also, please note that this description will reference a number of attachments included with the submission for these measures, including:

- S5_Diabetes_DataDictionary (Excel workbook attachment). This attachment describes the clinical relationships between diagnosis and procedure codes and the episode condition.
- S8_Diabetes_ClinicalLogic (Excel workbook attachment). This attachment includes Worksheets that describe the details around the components of diabetes methodologies that relate to comorbidities, condition status factors, and severity adjustment.

The individual Worksheets in these attachments that relate to the specific components of the methodology are referenced in the following discussion.

As noted above, the ETG episode building process has four important steps:

1. Identify Records; Assign Record Type and Anchor Records, Classify Diagnoses and Procedures
2. Build Episodes from Anchor Records
3. Group Non-Anchor Records to Episodes
4. Finalize the Episodes (identify comorbidities and complicating factors, and assign episode severity)

In this section we discuss how these steps apply specifically to creating Diabetes episodes.

Step 1 (Diabetes). Assign a Record Type and Anchor Records, Classify Diagnoses and Procedures

Record Type Assignment

Each service record, or claim line, is assigned a record type. Assigning Record Type uses a combination of the procedure code and the provider type on the claim. As described in Section I, there are 5 record types used by ETG:

- Management Records (for example, an office visit or consultation)
- Surgery Records (for example, a surgical procedure)
- Ancillary Records (for example, a lab test or imaging service)
- Facility Records (room and board)
- Pharmacy

Anchor Record Assignment

Anchor Records are also identified as part of this step. Anchor records play an important role in building Diabetes episodes. Anchor records have a record type of Management, Surgery, or Facility. An anchor record indicates that a clinician has evaluated the patient and has initiated the treatment and care of the patient for the condition.

Classify Diagnosis Codes

As described in Section I of this document, ETG relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an

ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes applied across all episodes, including ETG:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG. ICD-9 Diagnosis code 250.00 (diabetes, type II) is an example of a specific diagnosis code. It is primary to, and only eligible for, an episode of Diabetes.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG. ICD-9 Diagnosis code 251 (Other disorders of pancreatic internal secretion) is an example of a non-specific ICD-9 code. Although this code represents disease as opposed to signs or symptoms of disease, it is not specific as to representing a single disease. This code is assigned a lower specificity—Non-specific.
- Signs and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition. ICD-9 Diagnosis codes 788.42 (Polyuria) and 783.5 (Polydipsia) do not represent diseases, but only signs and symptoms that could be related to multiple diseases. These codes are assigned the lowest specificity— Signs and Symptoms. Signs and Symptoms codes may be eligible for many ETGs due to their generic nature.

The ETG methodology considers one member at a time. The service records and their diagnosis codes are grouped in several distinct passes for a member. The methodology first processes the specific and non-specific diagnosis codes on anchor records so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to. Using this approach, the logic described below that links service records to Diabetes episodes is applied.

Each diagnosis code is matched with one or more ETGs through a diagnosis eligibility table, including codes that match to the ETG for Diabetes. Each diagnosis code is further ranked, based on its strength of association with the Diabetes ETG and other ETGs. The rank values are:

- Primary Classification Ranking diagnoses: A primary ranking classification for a diagnosis describes a condition that defines Diabetes. These are the main diagnosis codes that impact grouping decisions for Diabetes. The Diagnosis codes that are classified as primary to Diabetes are listed on the “PrimaryDxCodes” worksheet within the attachment “S5_Diabetes_DataDictionary”.
- Incidental Classification Ranking diagnoses: Incidental diagnosis codes are eligible for Diabetes, but not classified as primary. Incidental diagnoses are further ranked as low, medium, and high, representing the strength of the match association with Diabetes. The Diagnosis codes that are incidental to Diabetes are listed on the “IncidentalDxCodes” worksheet within the attachment “S5_Diabetes_DataDictionary”. The column “diagnosisEligibilityType” in the worksheet describes the ranking where 3 represents a high association, 2 represents a medium association and 1 represents a low association.

Classify Procedure Codes

Procedure codes are also matched to Diabetes. All procedure codes that are eligible for Diabetes are listed on the “ProcedureCodes” worksheet within attachment “S5_Diabetes_DataDictionary”. In some instances a procedure code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the procedure code has eligibility, the ETG methodology uses strength of the clinical relationship between the procedure code and the episode. The CPT and HCPCS procedure codes on this worksheet are ranked from 1 to 4 to specify the strength of the clinical relationship between the procedure code and Diabetes. The column “ProcedureRank” in the worksheet describes that strength of association, with 4 being the strongest association and 1 being the lowest. The grouping of services based on diagnosis and procedure codes is further described below.

Step 2 (Diabetes). Build Episodes from Anchor Records.

Given the clinical relationships described in Step 1, the following steps are further used to build episodes from anchor records:

a. Anchor records are grouped in two passes through the member's data. The first pass groups the anchor records with specific and non-specific diagnoses. The second pass groups anchor records with sign and symptoms diagnoses.

b. All anchor records are grouped before all non-anchor records. Non-anchor records have a record type of Ancillary or Pharmacy.

c. An episode of Diabetes requires an anchor record to start an episode. For an anchor record to start an episode of Diabetes, it must have a procedure code that is eligible for Diabetes and an ICD-9 diagnosis code that is primary for Diabetes. As an example of an anchor record that starts an episode of Diabetes, an endocrinologist sees a member and submits a claim record using the CPT procedure code 99212 (Office visit, established patient) with and ICD-9 diagnosis code 250.00 (Diabetes, type II).

   Note that a single anchor record can start more than one episode. For example, an anchor record with a diagnosis and procedure code combination that is eligible for Diabetes will start a Diabetes episode. If that record also has a diagnosis and procedure code combination that is eligible for Hypertension, it will also start a Hypertension episode. (See Section I above for a discussion of the concept of phantom episode clusters.)

d. Once an episode of Diabetes is started, further anchor records can group to that episode. For a record to be eligible to join an already open episode of Diabetes the procedure code for the record must be eligible for Diabetes and the diagnosis code must have either a primary or incidental relationship to Diabetes.

e. In some cases, an anchor record can be eligible to join more than one episode (because it may have more than one diagnosis code). When determining the episode an anchor record groups to, the specificity of the diagnoses determines the priority for grouping the record. For Diabetes, a specific code (like 250.00 {Diabetes, type II}) has priority over a non-specific code (like 251 {Other disorders of pancreatic internal secretion}).

f. As described above, diagnosis codes with specificity of sign and symptom have the lowest priority for grouping. An example of a sign and symptom code is 788.42 (Polyuria). Anchor records with only sign and symptom diagnosis codes are not grouped until anchor records with more specific disease diagnosis codes are grouped. For example, an office visit record on Jan 15th with an ICD-9 code of 788.42 (Polyuria) is followed by an office visit record on Feb 1st with an ICD-9 code of 250.00. The grouper would skip the anchor record service on Jan 15th because it only had a sign and symptom diagnosis code. It would then open up an episode of Diabetes based on the claim on Feb 1st. On the second pass, the grouper would use the incidental relationship between the sign and symptom ICD-9 code 788.42 to group this claim to the already open Diabetes episode. Without this methodology, the claim on Jan 15th would not group to the Diabetes episode on the first pass because at the time of the first pass evaluating the claim on Jan 15th, the Diabetes episode did not exist.

g. Following these steps, anchor records have been used to open episodes of Diabetes, as well as episodes for other conditions and anchor records have been assigned uniquely to individual episodes based on the clinical logic described above and in the attachment "S5_Diabetes_DataDictionary".

Step 3 (Diabetes). Group Non-Anchor Records to Episodes.

Non-anchor records (record type "Ancillary" and "Pharmacy") can not open episodes on their own. For example, a service record with a procedure code of 83036 (Hemoglobin; glycosylated, A1c) and an ICD-9 code of 250.00 (Diabetes, type II) can group to an open episode of Diabetes but can not open the episode itself.

Ancillary service records group to Diabetes based on a match of diagnosis and procedure code to Diabetes. As described above, attachment S5_Diabetes_DataDictionary includes the diagnosis and procedure mappings for Diabetes that inform these assignments.

In some instances an Ancillary procedure code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the procedure code has eligibility, the ETG methodology uses strength of the clinical relationship between the procedure code and the episode. The column "ProcedureRank" in the "ProcedureCodes" worksheet within attachment "S5_Diabetes_DataDictionary" describes that strength of association, with 4 being the strongest association and 1 being the lowest.

Pharmacy services group differently because they usually do not have ICD-9 diagnosis codes associated with them. Pharmacy claims group by using a table that maps NDC to the ETG DCC code (Drug Category Code) based on the drug's active ingredients and route of administration. Selected pharmacy services with a CPT or HCPCS code are also mapped to a DCC (e.g., J-codes describing injections). For example, a service with an NDC code 54124005230 (Diabeta 5mg tablet) will map to DCC 50006. The DCC 50006 has a relationship with Diabetes as defined by the "Pharmacy" worksheet in the attachment "S5_Diabetes_DataDictionary". Therefore this claim could join an open episode of Diabetes. It could not, however, start an episode of Diabetes on its own.

In some instances a DCC code may be eligible for more than one ETG. In these cases, where multiple episodes are observed for a member where the DCC code has eligibility, the ETG methodology uses strength of the clinical relationship between the DCC code and the episode. The column "Rank" in the "Pharmacy" worksheet within attachment "S5_Diabetes_DataDictionary" describes that strength of association. The lower the value is for Rank, the stronger the association between the DCC and the episode.

Due to the size of the attachment the full list of NDC to DCC mappings has not been provided within this submission. This file is available upon request.

Step 4 (Diabetes): Finalize the Episodes (Identify Comorbidities and Complicating Factors, and Assign Episode Severity)

Episode Completeness

Episode completeness, the assignment of comorbidities and condition status, and the measurement of episode severity are the key steps in finalizing a Diabetes episode.

In terms of episode completeness, Diabetes is a life-long, chronic condition. Therefore the clean periods described in Section I as part of the general ETG methodology are not applicable. All clinically consistent treatments for the care of a diabetic patient will group to the episode of Diabetes for as long as data are available. To support proper episode comparisons, it is recommended that these longer Diabetes episodes be divided into annual increments.

Assigning Comorbidities and Condition Status Factors to Diabetes Episodes

The ETG methodology identifies the comorbidities and condition status factors observed for each Diabetes episode. These factors provide specificity of the episode's clinical condition and also play a key role in assigning a severity score and level to the episode. An example of the assignment of comorbidities and condition status factors and creation of a severity score and level is provided at the end of step 4 and references to this example are provided in the following text.

Condition status factors for Diabetes episodes are identified by diagnosis codes on anchor records that occur within the Diabetes episode. The "ConditionStatustoDxCodeMap" Worksheet in the attachment "S8_Diabetes_ClinicalLogic" describes the mapping of diagnosis codes to condition status factors. In particular, the following condition status factors are defined for Diabetes:

- Diabetes type I
- Diabetes type II or unknown type
- Diabetic coma
- Diabetic hyperosmolar coma
- Diabetic ketoacidosis

In some cases, ETG requires condition status factors to compete in order to decide which condition status factor applies. For example, Diabetes has condition status factors for Type I and Type II Diabetes (see worksheet "ConditionStatuses" within workbook S8_Diabetes_ClinicalLogic). For Diabetes episodes that have both of these condition status factors, only one can apply. In these cases, ETG chooses the condition status factors that are marked on the greatest number of Anchor claims. In the example included below, the condition status factor, or complication, of 70006 (Diabetes Type I) is assigned to the Diabetes episode based upon the diagnosis information on the anchor records within the Diabetes episode.

Comorbidity factors for Diabetes episodes are identified by evaluating diagnosis codes on the records designated as anchor records from outside the Diabetes episode. ETG tracks all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as with comorbidity. The comorbidity groups defined by ETG for Diabetes are described in the "ComorbtoDxCodeMap" Worksheet in the attachment "S8_Diabetes_ClinicalLogic", including the individual diagnosis codes that map to each. Examples of these comorbidity groups include Ischemic Heart Disease, Congestive Heart Failure, and COPD. In the example included below, the comorbidities 80176 (Aortic aneurysm) and 80834 (Multiple sclerosis) is assigned to the Diabetes episode based upon the diagnosis information on anchor records that occur outside of the Diabetes episode.

Assigning Severity to Diabetes Episodes

Condition status factors, comorbidities and patient demographics are used in determining the severity of the Diabetes episode. The ETG methodology takes advantage of the relevant condition status and comorbidity factors when determining an episode's severity. In general, these factors indicate a higher risk patient who may require more extensive treatment for Diabetes. The result is a severity score and severity level for each episode. The higher the severity score, the more resources are expected relative to other diabetic episodes.

The condition status and comorbidity factors found to have an impact on the required resources for Diabetes episodes are included in the severity model. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for the base ETG of Diabetes. There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights.

The following worksheets in the attachment "S8_Diabetes_ClinicalLogic" describe the factors and weightings used in determining the level of severity for a Diabetes episode (see the notes at the top of each worksheet for a further description of the comorbidity or condition status concept):

- Worksheet "Comorbidities" – includes the ComorbidityCodes and Comorbidity Groups used to determine severity for Diabetes. The rightmost columns include a "Priority" hierarchy along with risk weights for the non-elderly and elderly models. The Priority column is applied where multiple ComorbidityCodes in the same Comorbidity group are identified, with the lowest number priority receiving precedence. Each risk weight reflects the incremental contribution of having a specific Comorbidity factor on Diabetes severity. (Note that a number of the individual ComorbidityCodes

that are clinically similar are combined and used as a group in measuring severity. Only one of these individual Codes is needed to trigger the aggregate Comorbidity Group2, after application of any relevant Priority.);

- Worksheet "ComorbidityInteractions" – includes the interactions between Comorbidity Groups used to determine severity for Diabetes. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Comorbidity interaction factor on Diabetes severity;
- Worksheet "ComorbidityCounts" – includes the additional severity factors added for those episodes where 3 or 4+ comorbidity factors were observed. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Comorbidity Count factor on Diabetes severity;
- Worksheet "ConditionStatuses" – includes the Condition Status factors used to determine severity for Diabetes. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status factor on Diabetes severity;
- Worksheet "ConditionStatusInteractions" – includes the interactions between Condition Status factors used to determine severity for Diabetes. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific Condition Status interaction factor on Diabetes severity;
- Worksheet "ConditionStatusCounts" – includes the additional severity factors added for those episodes where 3 or 4+ condition status factors were observed. The rightmost columns include risk weights for the non-elderly and elderly models. Each risk weight reflects the incremental contribution of having a specific ConditionStatus Count factor on Diabetes severity;
- Worksheet "Demographics" – includes the additional severity factors added based on age and gender. Each risk weight reflects the incremental contribution of having a specific Demographic factor on Diabetes severity;

The severity score for a Diabetes episode is the sum of the weights for each of the factors observed for the episode.

The following example shows the calculation of severity score and level for a Diabetes episode. The example describes a Male patient, age 47, observed to have a number of anchor records with a diagnosis that maps to the Diabetes ETG. The patient is also observed to have one condition status factor and two comorbidities that are also eligible for Diabetes. The condition status factor (70006: Diabetes, Type I) was identified through one or more anchor records observed within the episode where the diagnosis on the records mapped to that condition status factor. The comorbidities (80176: Aortic aneurysm and 80834: Multiple Sclerosis) both were identified on one or more anchor records observed outside of the Diabetes episode.

The patient receives a severity marker for each of the condition status and comorbidity factors and a risk weight is assigned to each. The patient also receives severity weight related to his age and gender which fall into the "Male 45-54" range. Finally, the patient receives additional severity weight due to an interaction term included in the severity model for Diabetes.

A severity score of 1.9686 is calculated based upon the sum of:

- The Demographic weight of 0.7329 (see worksheet "Demographics" within S8_Diabetes_ClinicalLogic where column "gender"=M and column "ageRange"=45-54);
- The condition status weight for Diabetes Type I of 0.7338 (see worksheet "ConditionStatuses" within S8_Diabetes_ClinicalLogic where column "conditionStatusCode"=70006),
- The comorbidity weight for Aortic Aneurysm of 0.4269 (see worksheet "Comorbidities" within S8_Diabetes_ClinicalLogic where column "comorbiditycode"=80176. The Aortic Aneurysm comorbidity belongs to the Comorbiditygroup2 of Aterial Disease.);
- The comorbidity weight for Multiple Sclerosis of 0.1885 (see worksheet "Comorbidities" within S8_Diabetes_ClinicalLogic where column "comorbiditycode"=80834. Multiple Sclerosis belongs to the comorbidity group of Congenital and Degenerative Disease CNS.).

- The interaction weight of -0.1135 for the interaction of the Arterial Disease and Congenital and Degenerative Disease CNS comorbidity groups. (Using the worksheet "ComorbidityInteractions" within S8_Diabetes_ClinicalLogic the interaction of these two comorbidity groups results in an adjustment of the severity score by -0.1135 (where column "FirstComorbidityGroup2"=Congenital and Degenerative Disease CNS and column "SecondComorbidityGroup2"=Arterial Disease).
- The final severity score, including the comorbidity interaction adjustment is calculated as 0.7329 + 0.7338 + 0.4269 + 0.1885 + (-0.1135) = 1.9686

Based on the severity score, the severity "level" indicates a categorical ranking of where the specific episode is relative to the population of all Diabetes episodes. There are four potential severity levels for Diabetes, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. The "Thresholds" Worksheet in attachment "S8_Diabetes_ClinicalLogic" describe the three cut-off points that define the four levels of severity for Diabetes episodes.

Episode	ETG(Base Condition)	Complications			
00001	Diabetes	70006			
		Comorbidities			
		80176	80834		
		Severity Level			
		1	2	3	4
		<1.0	1.0-1.4	1.4-1.7	>1.7
		Calculation of Relative Episode Severity			
		Indicator	Code	Description	Severity Weight
		Demographic	M1218	Male, 45-54 yrs	0.7329
		Condition Status	70006	Diabetes type I	0.7338
		Co-morbidity	80176	Aortic aneurysm	0.4269
			80834	Multiple sclerosis	0.1885
		Interaction	80176 + 80834		-0.1135
		Total			1.9686

Example of Calculating ETG Episode Severity Score and Level.

The ETG methodology for Diabetes uses medical and pharmacy service records/claims and member enrollment as input. Outputs for Diabetes include the identification of the individual service records assigned to a Diabetes episode, along with the details of the grouping, including ETG, episode ID, record type, cluster ID, and cluster provider. An episode summary record is also produced, describing the episode ID, the ETG assigned (Diabetes), the severity score and severity level for the episode, episode completion status, and other episode-level characteristics.

Note that the episode grouping methodology for Diabetes is applied in the context of the full-breadth of the ETG clinical methodology, where all clinical conditions and episodes can be considered and created for a member. In this way, decisions regarding the appropriate assignment of a service record to an individual Diabetes episode can be made while considering all conditions and episodes for that member, including episodes other than Diabetes.

The episode results can then be used to support episode-based measures of the resources involved in diagnosing, managing and treating Diabetes as further discussed within the Diabetes specifications provided in the submission form.

Medical Claim Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

RX Claim Data Elements

NQF Resource Use Measure submission
For question S6 - Answer: Ingenix Data Protocol
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, C

Data Element Name	Field Type	Maximum Length
Member ID	alphanum	32
Date of Service	date	10
Payment Date	date	10
NDC Code	alphanum	11
Prescribing Provider ID	alphanum	20
Allowed Amount	numeric	10.2
Requested/Billed Amount	numeric	10.2
Payment Amount	numeric	10.2

CAD, Non-Condition Specific/Population

Data Element Comments

Unique Member Identifier
May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Includes capitation and patient liability amounts
Includes withhold amounts

Member Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, No

Data Element Name	Field Type	Maximum Length
Member ID	alphanum	32
Sex	alphanum	1
Date of Birth	date	10
Effective Date	date	10
End Date	date	10
Member Zip Code	alphanum	10
Member State Code	alphanum	2
Pharmacy Benefit Flag	alphanum	1
PCP ID	alphanum	20
Product/Coverage Code Identifier	alphanum	30

n-Condition Specific/Population

Data Element Comments
Unique Member Identifier
Eligibility Begin Date
Eligibility End Date
Supports geographic-based member analysis. May be omitted if not available or applicable.
Supports geographic-based member analysis. May be omitted if not available or applicable.
Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

Provider Data Elements

NQF Resource Use Measure submission

For question S6 - Answer: Ingenix Data Protocol

The content contained in this document is proprietary and confidenti

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Str

Data Element Name	Field Type	Maximum Length
Provider ID	alphanum	20
Provider Specialty	alphanum	30
PCP Indicator	numeric	1
Provider Zip Code	alphanum	10
Provider State Code	alphanum	2
Provider Affiliation	alphanum	30

al
oke, CAD, Non-Condition Specific/Population

Data Element Comments

Unique Provider Identifier
Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
Indicates whether or not the Provider can serve as a PCP
Supports geographic-based provider analysis. May be omitted if not available or applicable.
Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

Medical Claim Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

RX Claim Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

The content contained in this document is proprietary and confidential

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
Payment Date	date	10	
NDC Code	alphanum	11	
Prescribing Provider ID	alphanum	20	May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

Member Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Sex	alphanum	1	
Date of Birth	date	10	
Effective Date	date	10	Eligibility Begin Date
End Date	date	10	Eligibility End Date
Member Zip Code	alphanum	10	Supports geographic-based member analysis. May be omitted if not available or applicable.
Member State Code	alphanum	2	Supports geographic-based member analysis. May be omitted if not available or applicable.
Pharmacy Benefit Flag	alphanum	1	
PCP ID	alphanum	20	Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Product/Coverage Code Identifier	alphanum	30	Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

Provider Data Elements

NQF Resource Use Measure submission

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
PCP Indicator	numeric	1	Indicates whether or not the Provider can serve as a PCP
Provider Zip Code	alphanum	10	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider State Code	alphanum	2	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider Affiliation	alphanum	30	Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

NQF Resource Use Measure submission
For question S10 - Answer: Ingenix Risk Adjustment Method Example
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Cardiology, Medical Group A			
Condition and Severity Level	**Number of Episodes**	**Observed Cost per Episode**	**Peers Cost per Episode**
Dr Jones	**By Condition and Severity Level**		
CHF, Level 1	20	$1,116	$1,320
CHF, Level 2	16	$1,775	$2,234
CHF, Level 3	12	$2,977	$3,145
Dr Smith	**By Condition and Severity Level**		
CHF, Level 1	30	$1,520	$1,320
CHF, Level 3	12	$3,349	$3,145
Dr Jones	**By Condition**		
CHF	48	1,801	2,081
Dr Smith	**By Condition**		
CHF	42	2,043	1,841

Relative Cost of Care Ratio
0.85
0.79
0.95
1.15
1.06
0.87
1.11

Reliability Across HCOs

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: Diabetes

	ETG Base 163000 - Diabetes									
	Data Source									
Endocrinology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	3,847	-	905	1,456	8,782	486	849	3,947	468	20,739
Cost per Episode	$ 3,081	-	$ 4,056	$ 3,335	$ 3,434	$ 4,900	$ 3,215	$ 3,697	$ 4,427	$ 3,487
Primary Care Core Cost per Episode	$ 71	-	$ 134	$ 98	$ 73	$ 134	$ 107	$ 147	$ 71	$ 94
Specialist Cost per Episode	$ 825	-	$ 1,392	$ 768	$ 748	$ 1,485	$ 1,175	$ 912	$ 924	$ 862
ER Cost per Episode	$ 47	-	$ 59	$ 33	$ 45	$ 67	$ 55	$ 33	$ 35	$ 44
Radiology Cost per Episode	$ 17	-	$ 130	$ 11	$ 19	$ 38	$ 40	$ 32	$ 45	$ 27
RX Cost per Episode	$ 1,914	-	$ 2,004	$ 2,155	$ 2,307	$ 2,843	$ 1,535	$ 2,170	$ 3,025	$ 2,181
Lab Cost per Episode	$ 91	-	$ 160	$ 116	$ 60	$ 154	$ 118	$ 125	$ 126	$ 93
Hospital Cost per Episode	$ 116	-	$ 179	$ 153	$ 182	$ 179	$ 184	$ 277	$ 201	$ 186

	ETG Base 163000 - Diabetes									
	Data Source									
Endocrinology Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	3,847	-	905	1,456	8,782	486	849	3,947	468	20,739
Specialist Visits per 1000 Episodes	3,568	-	5,759	5,250	4,671	4,071	6,503	3,901	3,482	4,442
Radiology Encounters per 1000 Episodes	74	-	106	55	63	63	71	65	48	66
Lab Encounters per 1000 Episodes	2,287	-	2,516	2,612	1,590	2,585	2,815	2,537	2,337	2,102
MRI Encounters per 1000 Episodes	5	-	5	4	6	5	7	6	2	6
ER Visits per 1000 Episodes	72	-	142	53	78	82	143	85	46	81
Inpatient Days per 1000 Episodes	49	-	146	184	142	27	186	147	38	126
Admissions per 1000 Episodes	16	-	17	16	18	12	34	40	6	22

	ETG Base 163000 - Diabetes									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	12,569	2,562	9,857	12,107	16,412	4,357	6,093	33,463	2,955	100,376
Cost per Episode	$ 1,528	$ 2,204	$ 1,915	$ 1,799	$ 1,945	$ 2,344	$ 1,818	$ 1,730	$ 2,005	$ 1,819
Primary Care Core Cost per Episode	$ 228	$ 289	$ 243	$ 149	$ 163	$ 340	$ 209	$ 255	$ 234	$ 224
Specialist Cost per Episode	$ 162	$ 281	$ 376	$ 262	$ 269	$ 342	$ 411	$ 256	$ 153	$ 270

ER Cost per Episode	$ 34	$ 40	$ 56	$ 47	$ 60	$ 92	$ 54	$ 35	$ 30	$ 46
Radiology Cost per Episode	$ 13	$ 24	$ 75	$ 13	$ 15	$ 48	$ 28	$ 37	$ 40	$ 31
RX Cost per Episode	$ 979	$ 1,315	$ 1,016	$ 1,140	$ 1,256	$ 1,322	$ 909	$ 944	$ 1,397	$ 1,067
Lab Cost per Episode	$ 28	$ 147	$ 70	$ 68	$ 29	$ 69	$ 52	$ 61	$ 59	$ 55
Hospital Cost per Episode	$ 84	$ 108	$ 78	$ 121	$ 152	$ 132	$ 155	$ 142	$ 93	$ 126

	ETG Base 163000 - Diabetes									
	Data Source									
Family Practice Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	12,569	2,562	9,857	12,107	16,412	4,357	6,093	33,463	2,955	100,376
Specialist Visits per 1000 Episodes	2,443	2,606	3,142	3,039	3,235	2,481	3,913	2,629	2,283	2,865
Radiology Encounters per 1000 Episodes	61	51	91	60	55	66	76	69	41	66
Lab Encounters per 1000 Episodes	1,494	2,058	1,713	2,130	804	1,800	2,454	1,900	1,635	1,705
MRI Encounters per 1000 Episodes	4	6	6	4	6	7	5	5	3	5
ER Visits per 1000 Episodes	59	47	128	73	100	104	180	101	45	97
Inpatient Days per 1000 Episodes	33	77	37	176	150	28	151	86	20	95
Admissions per 1000 Episodes	9	11	9	19	18	11	30	20	5	17

	ETG Base 163000 - Diabetes									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	12,937	6,673	8,522	14,904	51,679	1,777	4,089	25,282	2,269	128,131
Cost per Episode	$ 1,738	$ 2,095	$ 2,402	$ 1,779	$ 1,985	$ 2,733	$ 1,912	$ 1,865	$ 2,359	$ 1,960
Primary Care Core Cost per Episode	$ 242	$ 282	$ 164	$ 149	$ 170	$ 351	$ 228	$ 247	$ 254	$ 201
Specialist Cost per Episode	$ 241	$ 239	$ 632	$ 240	$ 277	$ 439	$ 459	$ 289	$ 239	$ 301
ER Cost per Episode	$ 39	$ 33	$ 64	$ 43	$ 45	$ 108	$ 54	$ 38	$ 37	$ 45
Radiology Cost per Episode	$ 18	$ 25	$ 79	$ 12	$ 15	$ 42	$ 29	$ 35	$ 49	$ 25
RX Cost per Episode	$ 1,044	$ 1,287	$ 1,264	$ 1,163	$ 1,299	$ 1,549	$ 903	$ 979	$ 1,590	$ 1,187
Lab Cost per Episode	$ 38	$ 146	$ 104	$ 64	$ 24	$ 69	$ 63	$ 73	$ 64	$ 54
Hospital Cost per Episode	$ 116	$ 83	$ 95	$ 108	$ 154	$ 175	$ 175	$ 203	$ 126	$ 147

	ETG Base 163000 - Diabetes									
	Data Source									
Internal Medicine Peer Definition	HCO: A	HCO: B	HCO: C	HCO: D	HCO: E	HCO: F	HCO: G	HCO: H	HCO: J	total
Episode Quantity	12,937	6,673	8,522	14,904	51,679	1,777	4,089	25,282	2,269	128,131
Specialist Visits per 1000 Episodes	2,940	2,504	3,664	3,056	3,382	2,858	3,938	2,746	2,657	3,145
Radiology Encounters per 1000 Episodes	72	52	95	53	55	62	67	67	53	62

Lab Encounters per 1000 Episodes	1,603	1,979	1,805	1,847	808	1,794	2,163	1,900	1,663	1,424
MRI Encounters per 1000 Episodes	4	5	5	4	5	7	4	5	4	5
ER Visits per 1000 Episodes	66	40	131	70	85	102	137	93	52	85
Inpatient Days per 1000 Episodes	88	69	45	144	172	69	228	160	67	142
Admissions per 1000 Episodes	16	9	11	17	20	14	30	33	7	21

Results Across Peer Groups, Cost

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: Diabetes

	ETG Base=163000 (Diabetes)				
	Severity				
	1	2	3	4	Total
Endocrinology Peer Definition					
# of Episodes	10,990	3,223	3,536	2,990	20,739
Total Cost per Episode	$ 2,489	$ 3,408	$ 4,727	$ 5,774	$ 3,487
Primary Care Core Cost per Episode	$ 87	$ 95	$ 87	$ 124	$ 94
Specialty Care Cost per Episode	$ 461	$ 675	$ 1,516	$ 1,761	$ 862
ER Cost per Episode	$ 31	$ 40	$ 40	$ 95	$ 44
Radiology Cost per Episode	$ 24	$ 28	$ 17	$ 49	$ 27
Pharmacy Cost per Episode	$ 1,732	$ 2,348	$ 2,804	$ 2,918	$ 2,181
Laboratory Cost per Episode	$ 82	$ 88	$ 107	$ 120	$ 93
Hospital Services Cost per Episode	$ 70	$ 133	$ 155	$ 708	$ 186

	ETG Base=163000 (Diabetes)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	75,941	13,231	5,829	5,375	100,376
Total Cost per Episode	$ 1,458	$ 2,183	$ 3,084	$ 4,638	$ 1,819
Primary Care Core Cost per Episode	$ 217	$ 232	$ 240	$ 287	$ 224
Specialty Care Cost per Episode	$ 166	$ 326	$ 700	$ 1,122	$ 270
ER Cost per Episode	$ 35	$ 53	$ 66	$ 163	$ 46
Radiology Cost per Episode	$ 27	$ 36	$ 33	$ 71	$ 31
Pharmacy Cost per Episode	$ 901	$ 1,332	$ 1,804	$ 1,968	$ 1,067
Laboratory Cost per Episode	$ 51	$ 59	$ 69	$ 91	$ 55
Hospital Services Cost per Episode	$ 61	$ 146	$ 172	$ 936	$ 126

	ETG Base=163000 (Diabetes)				
	Severity				
	1	2	3	4	Total
Internal Medicine Peer Definition					
# of Episodes	90,109	20,842	8,410	8,769	128,131
Total Cost per Episode	$ 1,499	$ 2,288	$ 3,233	$ 4,699	$ 1,960
Primary Care Core Cost per Episode	$ 192	$ 209	$ 220	$ 263	$ 201
Specialty Care Cost per Episode	$ 176	$ 345	$ 701	$ 1,096	$ 301
ER Cost per Episode	$ 35	$ 48	$ 56	$ 132	$ 45
Radiology Cost per Episode	$ 21	$ 28	$ 29	$ 53	$ 25
Pharmacy Cost per Episode	$ 967	$ 1,450	$ 1,959	$ 2,084	$ 1,187
Laboratory Cost per Episode	$ 49	$ 55	$ 69	$ 88	$ 54
Hospital Services Cost per Episode	$ 60	$ 153	$ 199	$ 983	$ 147

Results Across Peer Groups, Utils

NQF Resource Use Measure submission

For question SA - Answer: Ingenix Reliability and Validity Testing

The content contained in this document is proprietary and confidential

Measure: Diabetes

	ETG Base=163000 (Diabetes)				
	Severity				
	1	2	3	4	Total
Endocrinology Peer Definition					
# of Episodes	10,990	3,223	3,536	2,990	20,739
Specialist Visits per 1000 Episodes	3,695	5,022	4,045	7,031	4,442
Radiology Encounters per 1000 Episodes	65	65	46	98	66
Laboratory Encounters per 1000 Episodes	1,943	2,191	2,223	2,449	2,102
MRI Encounters per 1000 Episodes	6	4	4	7	6
ER Visits per 1000 Episodes	64	76	81	153	81
Admission Days per 1000 Episodes	13	114	68	619	126
Number of Admissions per 1000 Episodes	6	19	14	96	22
Number of Prescriptions per 1000 Episodes	15,936	17,775	16,963	17,254	16,587
Number of Generic Prescriptions per 1000 Episodes	5,857	5,238	2,182	2,535	4,656

	ETG Base=163000 (Diabetes)				
	Severity				
	1	2	3	4	Total
Family Practice Peer Definition					
# of Episodes	75,941	13,231	5,829	5,375	100,376
Specialist Visits per 1000 Episodes	2,461	3,433	3,749	6,226	2,865
Radiology Encounters per 1000 Episodes	59	74	73	137	66
Laboratory Encounters per 1000 Episodes	1,596	1,904	1,920	2,521	1,705
MRI Encounters per 1000 Episodes	5	6	6	7	5
ER Visits per 1000 Episodes	76	113	142	301	97
Admission Days per 1000 Episodes	27	147	168	857	95
Number of Admissions per 1000 Episodes	5	22	23	159	17
Number of Prescriptions per 1000 Episodes	11,357	13,542	14,899	15,572	12,076
Number of Generic Prescriptions per 1000 Episodes	6,149	5,903	4,299	4,040	5,896

	ETG Base=163000 (Diabetes)				
	Severity				
	1	2	3	4	Total
Internal Medicine Peer Definition					
# of Episodes	90,109	20,842	8,410	8,769	128,131
Specialist Visits per 1000 Episodes	2,569	3,678	4,023	6,944	3,145
Radiology Encounters per 1000 Episodes	54	65	64	127	62
Laboratory Encounters per 1000 Episodes	1,308	1,495	1,727	2,160	1,424
MRI Encounters per 1000 Episodes	5	5	5	5	5
ER Visits per 1000 Episodes	66	96	106	232	85
Admission Days per 1000 Episodes	38	186	190	1,070	142
Number of Admissions per 1000 Episodes	7	25	26	147	21
Number of Prescriptions per 1000 Episodes	11,126	13,526	14,793	15,514	12,057
Number of Generic Prescriptions per 1000 Episodes	5,693	5,610	4,125	4,068	5,465

Exclusions

NQF Resource Use Measure submission
For question SA - Answer: Ingenix Reliability and Validity Testing
The content contained in this document is proprietary and confidential
Measure: Diabetes

	Data Source									
	HCO: A	**HCO: B**	**HCO: C**	**HCO: D**	**HCO: E**	**HCO: F**	**HCO: G**	**HCO: H**	**HCO: J**	**Total**
% Complete Episodes	83.91%	82.15%	77.90%	84.51%	81.85%	82.11%	81.72%	83.15%	81.84%	82.47%
% Incomplete Episodes	16.09%	17.85%	22.10%	15.49%	18.15%	17.89%	18.28%	16.85%	18.16%	17.53%
% Non-Outliers Episodes	89.30%	89.48%	84.52%	88.91%	89.16%	87.13%	77.92%	87.64%	88.64%	87.86%
% Hi Outliers Episodes	2.72%	5.18%	10.33%	2.01%	3.57%	5.65%	2.29%	3.79%	4.31%	4.08%
% Lo Outliers Episodes	7.98%	5.34%	5.14%	9.08%	7.27%	7.22%	19.79%	8.57%	7.05%	8.07%
% Non-Outliers + Hi Outliers Episodes	92.02%	94.66%	94.86%	90.92%	92.73%	92.78%	80.21%	91.43%	92.95%	91.93%
% Episodes Eligible for Attribution	77.19%	77.57%	73.64%	76.84%	75.91%	76.19%	66.24%	76.06%	76.09%	75.81%

Notes:
Data is based on the analysis of 9 Health Care Organizations (HCO) totaling more than 48 million episodes
Episodes are defined as either Complete or Incomplete according to ETG Methodology. See response for SA3.1 for additional details on Episode completion
Episodes are defined as Outliers according to the ETG Trim Point Methodology. See response for SA3.1 for additional details on Outlier Episodes
Episodes Eligible for Attribution represents episodes that are Complete, Non-Outliers or Hi Outliers, applicable for a peer group based upon the episode ETG.

A Physician Profile
Presented by Ingenix Impact Intelligence

Specialty Patterns of Care

For the 12 Months
Ending 12/31/2007

Physician		Number of Episodes:	93
Name:	Provider 6388502012	Case Mix, Episodes:	0.48
		Peer Group	
Primary ID:	6388502012	Peer Group Number of Episodes:	5,430
		Peer Group Name:	II Cardiology
Specialty:	Cardiology	Key Statistics	
		Overall Quality Index:	1.02
		Overall Cost Index, Episodes:	1.14
		Confidence Intervals for the Index	
		Overall Quality Index:	No data available
		Overall Cost Index, Episodes:	No data available

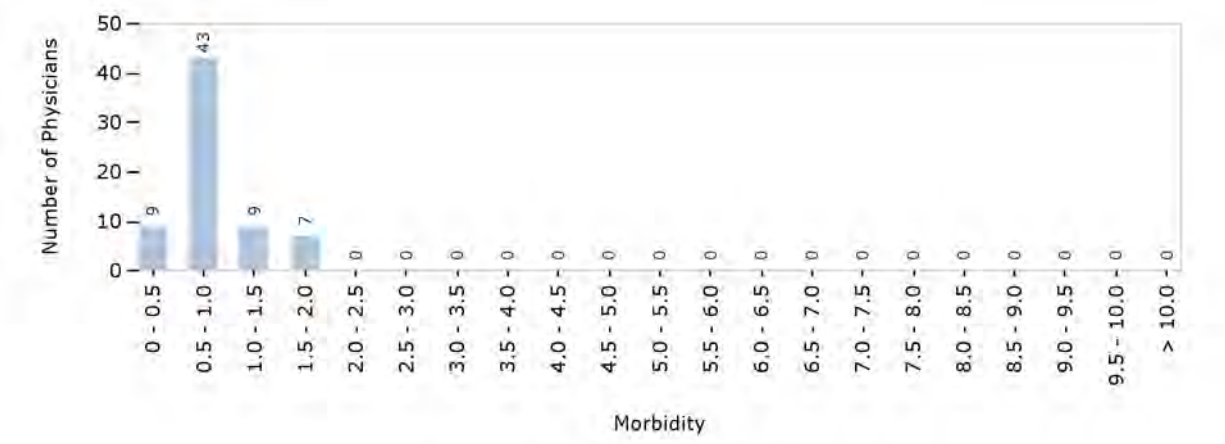
Statistical significance of difference between index and peer group average: * p<0.10; ** p < 0.05

Episode Case Mix Summary

Top 10 ETGs, by Total Cost (Completed Episodes of Care)

	Episodes			Encounters (Per 1000 Episodes)	
ETG Family Description	Episodes	Specialist's Cost / Episode	Peers Cost / Episode	Specialist's Encounters / 1000 Episode	Peers Encounters / 1000 Episode
Hypertension	43	$1,569.36	$1,228.51	14,779	12,844
Hyperlipidemia, other	19	$720.64	$631.67	7,169	6,829
Ischemic heart disease	9	$1,511.63	$2,378.04	12,889	13,765
Valvular disorder	14	$818.25	$1,047.19	4,367	7,315
Cardiomyopathy	3	$2,407.90	$1,340.66	16,583	14,088
Pulmonary embolism	1	$3,244.43	$3,897.41	38,714	24,716
Congestive heart failure	1	$2,817.56	$1,496.61	6,600	14,084
Atherosclerosis	2	$702.92	$387.57	1,500	1,125
Atrial fibrillation & flutter	1	$507.36	$1,715.52	25,500	21,127
All Others	0	--	--	--	--
All Episodes	93	$1,304.04	$1,211.06	11,523	10,879

Relative Morbidity Histogram

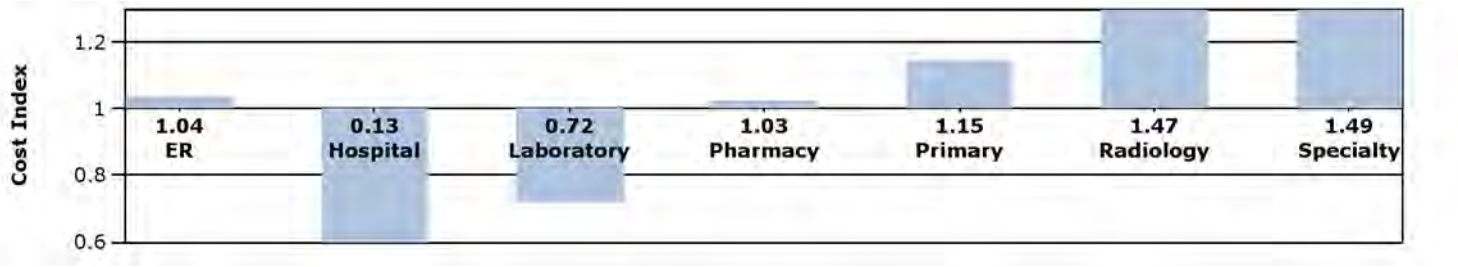

Number of Physicians
50
40
30
20
10
0
9
43
9
7
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
2.0 - 2.5
2.5 - 3.0
3.0 - 3.5
3.5 - 4.0
4.0 - 4.5
4.5 - 5.0
5.0 - 5.5
5.5 - 6.0
6.0 - 6.5
6.5 - 7.0
7.0 - 7.5
7.5 - 8.0
8.0 - 8.5
8.5 - 9.0
9.0 - 9.5
9.5 - 10.0
> 10.0
Morbidity

Quality Measures

As of the End of the Report Period
(Members Must be Continuously Enrolled with Plan a Minimum of 12 Months)

	Number of Quality Opportunities		Rates		Index
	With Compliance	Total	Provider Rate	Peer Rate	Quality Index
Cardiology					
HTN					
Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.	12	15	0.80	0.81	0.99
HTN					
Pt(s) taking an NSAID med.	21	23	0.91	0.92	0.99
HTN					
Pt(s) that had an annual physician visit.	23	23	1.00	0.97	1.03
HTN					
Pt(s) that had a serum creatinine in last 12 rpt mos.	19	23	0.83	0.80	1.03
CAD					
Pt(s) conon 2 meds (nitrate and phosphodiesterase type 5 inhibitor) w/ interacting properties.	6	6	1.00	1.00	1.00
CAD					
Pt(s) that had an OV for CAD care in last 12 rpt mos.	6	6	1.00	0.97	1.03
Endocrinology					
Hyperlipidemia					
Pt(s) taking a statin-containing med, nicotinic acid or fibric acid derivative that had an annual serum ALT or AST test.	10	10	1.00	0.92	1.09
Hyperlipidemia					
Pt(s) w/ a LDL cholesterol test in last 12 rpt mos.	16	16	1.00	0.90	1.12
Hyperlipidemia					
Pt(s) w/ the most recent LDL result <160mg/dL.	4	5	0.80	0.93	0.86
Hyperlipidemia					
Pt(s) w/ a HDL cholesterol test in last 12 rpt mos.	16	16	1.00	0.90	1.11
Hyperlipidemia					
Pt(s) w/ the most recent HDL result >= 40mg/dL.	1	5	0.20	0.68	0.29
Hyperlipidemia					
Pt(s) w/ a triglyceride test in last 12 rpt mos.	16	16	1.00	0.90	1.12
Total	150	164	0.91	0.89	1.03

Cost Index Summary, by Service Category



Cost and Utilization Summary Measures

Profiled Costs

	Actual Encounters	Peers Encounters	Actual Cost / Episode	Peers Cost / Episode	Cost / Episode Index	Actual Total Cost
ER	5	4	$53.98	$52.08	1.04	$5,020
Facility	3	2	$45.42	$45.48		$4,224
Professional	2	2	$8.56	$6.59		$796
Hospital Services	8	17	$29.49	$227.90	0.13	$2,743
Inpatient Facility	0	2	$0.00	$108.97		$0
Outpatient Hospital Surgery	0	2	$0.00	$57.97		$0
Laboratory	40	51	$19.29	$26.93	0.72	$1,794
Facility	0	3	$0.00	$6.96		$0
Professional	40	48	$19.29	$19.97		$1,794
Pharmacy	492	499	$271.71	$264.70	1.03	$25,269
Anti-Infective Agents	4	5	$0.37	$1.51		$35
Cardiovascular agents	359	393	$221.64	$227.13		$20,613
Primary Care Core	119	104	$68.41	$59.66	1.15	$6,362
PCC Diagnostic	57	61	$18.70	$28.57		$1,739
Radiology	34	27	$210.93	$143.69	1.47	$19,617
Facility	1	3	$2.51	$25.55		$234
Professional	34	24	$208.42	$118.14		$19,383
Specialty Care	373	309	$650.24	$436.10	1.49	$60,472
Medical Specialty	354	287	$606.05	$402.22		$56,363
PCP Specialty	1	3	$0.22	$3.31		$21
Surgical Specialty	3	4	$1.38	$4.23		$129
Total	1,072	1,012	$1,304.04	$1,211.06	1.08	$121,276

Overall Cost Index: 1.14

Utilization Rates Per 1,000 Episodes

	Actual	Peers	Index
Specialist Visit Rate	1,387	1,407	0.99
Other Specialty Care Rate	839	616	1.36
Radiology Procedure Rate	391	365	1.07
MRI Procedure Rate	0	3	0.00
Laboratory Procedure Rate	908	887	1.02
Overall Prescribing Rate	5,290	5,360	0.99
Generic Prescribing %	0%	0%	--
ER Visit Rate	48	41	1.19
Admits per 1000 Episodes	0	25	0.00
Days per 1000 Episodes	0	63	0.00
Average Length of Stay	--	2.50	0.00

Episode Detail and Analysis

Atherosclerosis

Total Specialty Episode Costs: $1,406

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	2	$702.92	$0.00	$702.92	$0.00	$0.00	$0.00	$0.00	$0.00
Peers		$387.57	$0.00	$387.57	$0.00	$0.00	$0.00	$0.00	$0.00
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			0	1,500	0	0	0	0	0
Peers			0	1,125	0	0	0	0	0
Index			--	--	--	--	--	--	--

Atrial fibrillation & flutter

Total Specialty Episode Costs: $507

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	1	$507.36	$6.20	$106.50	$25.66	$0.00	$75.58	$293.43	$0.00
Peers		$1,715.52	$35.87	$465.51	$46.52	$69.43	$459.09	$533.92	$105.18
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			1,000	9,000	3,500	0	1,000	11,000	0
Peers			1,435	6,459	2,597	208	319	9,968	141
Index			--	--	--	--	--	--	--

Cardiomyopathy

Total Specialty Episode Costs: $7,224

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	3	$2,407.90	$32.88	$1,410.90	$2.32	$0.00	$613.18	$348.61	$0.00
Peers		$1,340.66	$19.72	$515.26	$49.66	$109.92	$300.36	$345.74	$0.00
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			1,333	3,750	167	0	1,000	10,333	0
Peers			511	3,479	736	205	379	8,779	0
Index			--	--	--	--	--	--	--

Congestive heart failure

Total Specialty Episode Costs: $2,818

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	1	$2,817.56	$0.00	$655.48	$28.58	$682.19	$384.57	$0.00	$1,066.73
Peers		$1,496.61	$27.44	$714.02	$20.78	$106.20	$314.81	$286.36	$26.99
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			0	4,000	100	1,000	1,000	0	500
Peers			854	3,447	349	243	269	8,881	41
Index			--	--	--	--	--	--	--

Hyperlipidemia, other

Total Specialty Episode Costs: $13,932

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	19	$720.64	$38.46	$188.41	$20.36	$35.22	$0.00	$421.22	$16.97
Peers		$631.67	$28.58	$106.52	$34.61	$37.56	$9.55	$409.05	$5.80
Index			1.35	1.77	0.59	0.94	0.00	1.03	2.93
Encounters per 1000 Episodes									
Actual			719	1,748	719	52	0	3,879	52
Peers			581	1,180	788	60	13	4,203	5
Index			1.24	1.48	0.91	0.86	0.00	0.92	11.35

Hypertension

Total Specialty Episode Costs: $67,221

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	43	$1,569.36	$88.65	$760.21	$27.68	$311.39	$7.03	$324.61	$49.79
Peers		$1,228.51	$75.29	$468.78	$19.68	$188.49	$148.75	$266.33	$61.20
Index			1.18	1.62	1.41	1.65	0.05	1.22	0.81
Encounters per 1000 Episodes									
Actual			1,474	4,513	275	533	47	7,891	47
Peers			1,401	3,557	298	364	156	7,021	46
Index			1.05	1.27	0.92	1.46	0.30	1.12	1.02

Ischemic heart disease

Total Specialty Episode Costs: $13,605

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	9	$1,511.63	$160.14	$759.84	$7.31	$381.47	$0.00	$202.87	$0.00
Peers		$2,378.04	$45.89	$672.60	$29.37	$278.61	$978.17	$288.30	$85.11
Index			--	--	--	--	--	--	--
Encounters per 1000 Episodes									
Actual			2,935	5,500	176	611	0	3,667	0
Peers			1,218	5,527	684	613	541	5,077	106
Index			--	--	--	--	--	--	--

Valvular disorder

Total Specialty Episode Costs: $11,319

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	14	$818.25	$17.60	$679.04	$0.90	$106.43	$10.24	$4.04	$0.00
Peers		$1,047.19	$32.37	$590.16	$14.37	$108.66	$179.66	$61.34	$60.62
Index			0.54	1.15	0.06	0.98	0.06	0.07	0.00
Encounters per 1000 Episodes									
Actual			428	3,217	145	217	72	289	0
Peers			828	3,654	448	225	245	1,854	61
Index			0.52	0.88	0.32	0.96	0.29	0.16	0.00

Member Quality Non-Compliance List

Member ID	Member Name	Date of Birth	Gender	Age	Condition	Case	Rule
0231115813		3/25/1957	M	49	Cardiology	HTN	Pt(s) taking an NSAID med.
1576957219		9/21/1956	M	50	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
1722584502		3/16/1959	F	47	Cardiology	HTN	Pt(s) taking an NSAID med.
3510814590		8/22/1968	M	38	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
5095625983		1/7/1951	F	55	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent LDL result <160mg/dL.
5095625983		1/7/1951	F	55	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
6189711566		7/4/1953	M	53	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
6189711566		7/4/1953	M	53	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
7310373120		4/9/1960	M	46	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
8090910733		6/10/1963	F	43	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
8090910733		6/10/1963	F	43	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
8365387487		11/5/1952	M	54	Endocrinology	Hyperlipidemia	Pt(s) w/ the most recent HDL result >= 40mg/dL.
8577199106		6/16/1948	M	58	Cardiology	HTN	Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.
8577199106		6/16/1948	M	58	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.

Report Introduction and Interpretation

Patterns of Care

Episode Case Mix Summary

Panel Morbidity - Peer Distribution

Quality

Cost and Use

Episode Detail

Member Quality Non-Compliance

NATIONAL QUALITY FORUM

Resource Use Measure Evaluation 1.0
January 2011

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The subcriteria and most of the footnotes from the evaluation criteria are provided in Word comments within the form and will appear if your cursor is over the highlighted area. Hyperlinks to the evaluation criteria and ratings are provided in each section.

Resource Use Definition:

- Resource use measures are broadly applicable and comparable measures of input counts—(in terms of units or dollars)-- applied to a population or population sample
- Resource use measures count the frequency of specific resources; these resource units may be monetized, as appropriate.
- The approach to monetizing resource use varies and often depends on the perspective of the measurer and those being measured. Monetizing resource use allows for the aggregation across resources.

NQF Staff: NQF staff will complete a preliminary review of the measure to ensure conditions are met and the form has been completed according to the developer's intent. Staff comments have been highlighted in green.

TAP/Workgroup (if utilized)**:** Complete all yellow highlighted areas of the form. Evaluate the extent to which each subcriterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the subcriteria (yellow highlighted areas).*

Steering Committee: Complete all pink highlighted areas of the form. Review the workgroup/TAP assessment of the subcriteria, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the subcriteria are met (TAP or Steering Committee)
High (H) – based on the information submitted, there is high confidence (or certainty) that the criterion is met
Moderate (M) – based on the information submitted, there is moderate confidence (or certainty) that the criterion is met
Low (L) - based on the information submitted, there is low confidence (or certainty) that the criterion is met
Insufficient (I) – there is insufficient information submitted to evaluate whether the criterion is met, e.g., blank, incomplete, or information is not relevant, responsive, or specific to the particular question (unacceptable)
Not Applicable (NA) - Not applicable (only an option for a few subcriteria as indicated)

Evaluation ratings of whether the measure met the overall criterion (Steering Committee)
Yes (Y)- The overall criteria has been met
No (N)-The overall criterion has NOT been met
High (H) – There is high confidence (or certainty) that the criterion is met
Moderate (M) – There is moderate confidence (or certainty) that the criterion is met
Low (L) - There is low confidence (or certainty) that the criterion is met

Recommendations for endorsement (Steering Committee)
Yes (Y) – The measure should be recommended for endorsement
No (N)-The measure should NOT be recommended for endorsement
Abstain (A)- Abstain from voting to recommend the measure

TAP/Workgroup Reviewer Name:
Steering Committee Reviewer Name:
Staff Reviewer Name(s): Turbyville
NQF Review #: 1599 **NQF Project:** Endorsing Resource Use Standards- Phase II

BRIEF MEASURE INFORMATION
Measure Title: Measure Name: ETG Based NON-CONDITION SPECIFIC resource use measure
Measure Steward (IP Owner): Ingenix, 950 Winter Street, suite 3800, Waltham, Massachusetts, 02451
Brief description of measure: The measure focuses on resources used to diagnose, manage and treat a population of patients (non-condition specific) during a defined 12-month period of time. The population included in the measurement can be described generally. Examples include a population of individuals enrolled with a health plan, individuals assigned to a patient-centered medical home or accountable care organization (ACO), or a panel of individuals managed by a primary care physician (PCP). A number of resource use measures are defined for this measure set, including overall cost of care, cost of care by type of service, and the utilization of specific types of services. Each resource use measure is expressed as a cost or a utilization count per member per month and comparisons with internal and external benchmarks are made using risk adjustment to support valid comparisons. Risk adjustment is based on the measure of risk assigned to each individual using the Episode Risk Group (ERG) methodology
Resource use service categories: Inpatient services: Inpatient facility services Inpatient services: Admissions/discharges Ambulatory services: Outpatient facility services Ambulatory services: Emergency Department Ambulatory services: Pharmacy Ambulatory services: Evaluation and management Ambulatory services: Procedures and surgeries Ambulatory services: Imaging and diagnostic Ambulatory services: Lab services
Brief description of measure clinical logic: The clinical underpinnings of this non-condition measure are based on the relative health risk for an individual. This health risk relates to the relative expectation around the individual's healthcare expenditures and use – a higher level of risk is expected to correlate with a greater use of healthcare and healthcare costs. Episode Risk Groups (ERGs) is the risk assessment methodology used to measure risk for the submitted measures. ERG is based on the observed episodes of care for the individual, as created by Episode Treatment Groups (ETG). As described in the overview of ETG and ERG provided in the attachment to S2, ERG relies on ETG as the foundational element. A member's ETG episodes observed during the year provide the starting point for ERGs. ETG describes the unique clinical conditions for an individual and the services involved in their diagnosis, management and treatment. ETG also assigns a severity score and severity level to each condition episode – deriving from the condition status factors and co-morbidities observed for the condition. A member's ETGs and severity are then mapped to create an ERG array for the individual. The mappings of ETG and severity levels to the corresponding ERG are described in the worksheet "ERG-ETG List" within the attachment S5_Population_DataDictionary. Each element of the ERG array is assigned a weight that describes the incremental contribution of that ERG marker on health risk. Finally, an ERG risk score is translated to an ERG risk level, using discrete ranges of risk (e.g., a relative risk score between 0.0085 and 0.0695 is assigned to ERG risk category 1. ERG risk category ranges are described in the worksheet "ERG Risk Categories" within the attachment S5_Population_DataDictionary. The attachments to S2 and S5 provide greater detail on ERG.
If included in a composite or paired with another measure, please identify composite or paired measure:
Subject/ Topic Areas:
Type of resource use measure: Per capita (population- or patient-based)
Data Type: Administrative claims Other

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	**NQF Staff**
A. Measure Steward Agreement. *The measure is in the public domain or an intellectual property (measure steward agreement) is signed. Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.* **A.1.Do you attest that the measure steward holds intellectual property rights to the measure? (If no, do not submit)** Yes **A.2. Please check if either of the following apply:** Proprietary measure **A.3. Measure Steward Agreement.** Agreement signed and submitted **A.4. Measure Steward Agreement attached:** NQF Resource Use Addendum FINAL-634369193957845561.pdf	**A** **Y☐** **N☐**
B. Maintenance. *The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. (If no, do not submit)* Yes, information provided in contact section	**B** **Y☐** **N☐**
C. Purpose/ Use *(All the purposes and/or uses for which the measure is specified and tested:* Payment Program Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations)	**C** **Y☐** **N☐**
D. Testing. *The measure is fully specified and tested for reliability and validity (See guidance on measure testing).* Yes, reliability and validity testing completed	**D** **Y☐** **N☐**
E. Harmonization and Competing Measures. *Have NQF-endorsed measures been reviewed to identify if there are related or competing measures? (List the NQF # and title in the section on related and competing measures)* Yes *E.1.***Do you attest that measure harmonization issues with related measure (either the same measure focus or the same target population) have been considered and addresses as appropriate? (List the NQF # and title in the section on related and competing measures)** Yes *E.2.Do you attest that competing measures (both the same measure focus and the same target population)*	**E** **Y☐** **N☐**

have been considered and addressed where appropriate? Yes	
F. Submission Complete. *The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.*	**F** **Y☐** **N☐**
Have all conditions for consideration been met? Yes **Staff Notes to Steward** (*if submission returned*)**:**	**Y ☐** **N ☐**

Staff Notes to Reviewers (*issues or questions regarding any criteria*)**:**
Importance: No staff comments

Scientific Acceptability (SA)-

SA-Specifications: Are the specificaiotns clear enough for standardized implementation?

S6 Data Protocol: Guidelines are priovided, specifying types of data needed and steps to prepare data for specification.

S8 Clinical Framework: Devloper uses this section to describe the relative health risk for an individual—a critical part of the specification. Mappings of ETG and severity levels to the corresponding ERG are described in the worksheet "ERG-ETG List" within the attachment S5_Population_DataDictionary.

Is there sufficient infomraiton to map all individulas information to ETGs?

S9-Construction logic: Trigger and end defined as 12-month period. Resource units identificaiton apporach provided.

S10-Risk Adjustment: See clinical framework.

S10.3 Costing: Specifies the use of actual payment or costs or a standard price (standard prices not provided)

S11.1-attribution: Guidleines provided.

S11.4-outliers: General guidline provided, not detailed.

SA-Testing: Steering Committee members will receive a more in-depth review of measure testing in a "Risk Adjustment, and Measure Reliability and Validity Assessment Worksheet" at a future date. High level comments provided below:

SA1. Reliability: Large database used ot test reliability and validity of measure.
Are the results provided in enough detail?

Validity: Is testing approach and results provided in enough detail?

Risk Adjustment: Is testing approach and results provided in enough detail?

Usability: No staff comments

Feasibility: No staff comments

File Attachments Related to Measure/Criteria:
Attachment: ETG_ERG_ConstructLogic FINAL.doc
Attachment: S5_Population_DataDictionary.xls
Attachment: S5_Population_DataDictionary-634369196771301067.xls
Attachment: S6_DataProtocol-634369196961614785.xls
Attachment: S7.2_Data Source Reference-634369198947096242.xls
Attachment: S8_Population_ClinicalLogic.xls
Attachment:
Attachment: S9.7_RU_Categories-634369201486799996.xls
Attachment: S10_Risk Adjustment Method Example Population.xls
S12_sample_score_report_POP.pdf
Attachment: SA_Reliability_Validity Testing_POP.xls

IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in performance.	**Eval Rating**

Importance to Measure and Report is a threshold criterion that must be met in order to recommend a measure for endorsement. All subcriteria must be met to pass this criterion.	
High Impact **IM1. Demonstrated high impact aspect of healthcare:** Affects large numbers **IM1.1. Summary of evidence of high impact:** There is general evidence and wide acceptance that opportunities exist to improve the efficiency of how health care is delivered, including the resources used in diagnosing, managing and treating patients. Significant variation exists in resource use across and within geographic areas and across providers and delivery systems, indicating opportunities for improvement. New approaches focused on organizing the delivery and reimbursement of healthcare all require sound methods and measures to support the assessment of value, including the cost of care provided. **IM1.2. Citations for evidence of high impact cited in IM1.1.:** no references for Non-condition specific	**1a** **H☐** **M☐** **L☐** **I☐**
IM2. Opportunity for Improvement **IM2.1. Briefly explain the benefits envisioned by use of this measure:** Benefits envisioned by this set of measures relates to identifying opportunities and measuring value. In particular, the measure and its components can support: --The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and -- Measurement of the value delivered by individual providers, provider groups, and delivery systems – in particular the resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ERG methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement. **IM2.2. Summary of data demonstrating variation across providers or entities:** Episode results were not readily available for non-condition patients to support a specific analysis for that population. However, results for Diabetes, CAD and CHF can provide some insights. Data to explore this question were extracted from the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used for this analysis was primarily for commercial non-elderly individuals and covered the years 2009 thru 2010. In particular, data for 9 health care organizations including 7 million members were selected. The information was processed to produce Diabetes, CAD or CHF episodes. Incomplete and low cost outlier episodes were excluded. High cost outlier episodes were truncated at the high outlier threshold level. Episodes were attributed to providers in relevant specialties (peer groups). The observed and expected costs for Diabetes, CAD and CHF episodes, separately, were computed, with expected costs based on averages for a provider's peers, adjusted to reflect the provider's mix of Diabetes, CAD and CHF episodes by severity level. In particular, the following steps were performed: -- Computed the observed experience for the provider being measured, across all episodes to be included in the comparison; -- Computed the experience for the provider's peers. Compute this experience at the level of the risk adjustment, in this case ETG base condition and severity level. For a peer benchmark, average cost per episode across all peers for the ETG base condition and episode level can be computed.;	**1b** **H☐** **M☐** **L☐** **I☐**

-- Compared the observed experience to the expected result. This expected result is based on the peers average level of performance, adjusted to reflect the provider's own case mix of episodes by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio (O/E ratio) and is a risk adjusted measure. A ratio above 1.00 indicates greater resource use than peers, less than 1.00 lower resource use.

Variation in the O/E ratio across providers was assessed. In this way comparisons or relative resource use can be made, removing differences in the underlying mix of episodes included. Providers with greater than 20 CAD or 20 CHF episodes were selected. For CAD, 1,726 providers and 77,596 episodes were included covering the specialties of internal medicine, family practice and cardiology. For CHF, 107 providers and 3,000 episodes were included covering the specialties of internal medicine, family practice and cardiology. For Diabetes 3,306 providers and 136,498 episodes were included covering the specialties of internal medicine, family practice and endocrinology. The providers in each specialty were compared with their peers only (same specialty and same enrolled population for the healthcare organization). However, OE results were aggregated across healthcare organizations and specialties to summarize variation.

The observed variation in cost of care performance can be summarized using the inter-quartile range for the O/E ratio (the difference between the 25th and 75th percentile physician OE ratios). The results showed variation in performance across these measure physicians. In particular, the inter-quartile range for the O/E ration for the following key measures was approximately: (e.g., 0.60 can be interpreted as 40 percent below peers, 1.40 as 40 percent above peers)

For CAD
- Total Cost per Episode – 0.71 to 1.22
- Specialty Care Cost per Episode – 0.61 to 1.06
- Pharmacy Prescriptions per Episode – 0.76 to 1.20

For CHF
- Total Cost per Episode – 0.60 to 1.36
- Hospital Admissions per Episode – 0.52 to 1.38
- Specialty Care Cost per Episode – 0.52 to 1.38
- Pharmacy Prescriptions per Episode – 0.74 to 1.22

For Diabetes
- Total Cost per Episode – 0.84 to 1.13
- Specialty Care Cost per Episode – 0.60 to 1.20
- Pharmacy Prescriptions per Episode – 0.81 to 1.18

As shown, the variation observed across providers is significant.

IM2.3. Citations for data on variation:

Variations in per capita spending - Inpatient-based and specialist-oriented pattern of practice
Regional differences in Medicare spending are largely explained by the more inpatient-based and specialist-oriented pattern of practice observed in high-spending regions. Neither quality of care nor access to care appear to be better for Medicare enrollees in higher-spending regions.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care. Ann Intern Med . 2003 138(4): 273-287.
The Dartmouth Atlas shows a more than two-fold variation in per capita Medicare spending in different regions of the country. Adjusting for price differences leads to only a modest decline in overall variations. It is utilization -- the amount of care delivered to patients -- that explains most of the regional variation in Medicare spending. Most spending variation was due to differences in use of the hospital as a site of care (versus, say, hospice, nursing home, or the doctor's office) and to discretionary specialist visits and tests.

Reflections on variations, The Dartmouth Atlas Of Health Care. Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=1338. Accessed on February 12, 2011.

Variations in clinical decision making – ambulatory care-sensitive conditions
Clinicians have identified a group of diagnoses referred to as "ambulatory care-sensitive" conditions – such as poorly controlled diabetes or worsening heart failure – which can be treated in either the inpatient or the outpatient setting, and

for which hospitalization can often be prevented by better outpatient management. The variations among regions in admission rates of patients with these conditions can be ascribed to differences in clinical decision-making, rather than to differences in underlying illness rates. Hospitalization rates for these – and for most medical conditions – are also highly correlated with the local supply of hospital beds.
Hospital Discharges for Ambulatory Care-Sensitive Conditions Per 1,000 Medicare Enrollees, By Gender And Type Of Admission, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=20 Accessed on February 12, 2011.

Variations in the use of diagnostic tests and discretionary services
Variations in ECG ordering are not explained by patient characteristics. The tremendous nonclinical variations in ECG test ordering suggest a need for greater consensus about use of screening ECGs in primary care.
Randall SS, Bismruta M. Variation in routine electrocardiogram use in academic primary care practice. Arch Intern Med. 2001;161:2351-2355
Physicians in high-spending regions see patients back more frequently and are more likely to recommend screening tests of unproven benefit and discretionary interventions compared with physicians in low-spending regions; however, both appear equally likely to recommend guideline-supported interventions.

Physicians in higher-spending regions were much more likely than those in lower-spending regions to recommend discretionary services, such as referral to a subspecialist for typical gastroesophageal reflux or stable angina or, in another vignette, hospital admission for an 85-year-old patient with an exacerbation of end-stage congestive heart failure. And they were three times as likely to admit the latter patient directly to an intensive care unit and 30% less likely to discuss palliative care with the patient and family. Differences in the propensity to intervene in such gray areas of decision making were highly correlated with regional differences in per capita spending.

Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary decision making by primary care physicians and the cost of U.S. health care. Health Aff (Milwood), 2008; 27:813-823
Widely varying levels of health care spending across the United States are strongly correlated with the tendency of local physicians to recommend discretionary interventions. Physicians in regions of differing spending appear to differ only in their discretionary decision making. For decisions that are informed by evidence or practice guidelines (such as screening mammography and standard exercise tolerance testing), physicians were equally likely to recommend interventions regardless of local spending levels
Sirovich B, Gallagher PM, Wennberg DE, Fisher ES. Discretionary Decision Making By Primary Care Physicians And The Cost Of U.S. Health Care. Health Aff (Millwood). 2008; 27(3): 813–823.
Supply sensitive care
Supply-sensitive care accounts for more than half of all Medicare spending. In regions where there are more hospital beds per capita, patients will be more likely to be admitted to the hospital. In regions where there are more intensive care unit beds, more patients will be cared for in the ICU. More specialists will result in more visits to specialists. And the more CT scanners are available, the more CT scans patients will receive. The Dartmouth Atlas has consistently demonstrated these relationships.

Patients do not experience improved survival or better quality of life if they live in regions with more care. In fact, the care they receive appears to be worse. They report being less satisfied with their care than patients in regions that spend less, and having more trouble getting in to see their physicians.

Supply sensitive care, The Dartmouth Atlas Of Health Care (2005) Available at: http://www.dartmouthatlas.org/keyissues/issue.aspx?con=2937 Accessed on February 14, 2011.
Numerous studies have found that higher bed supply is associated with more hospital use for conditions where outpatient care is a viable alternative. This includes most medical causes of hospitalization. In 2006, bed supply remained an important determinant of medical discharges.
The implications of regional variations in Medicare spending. Part 1: the content, quality, and accessibility of care. Annals of Internal Medicine. Feb 18 2003;138(4):273-287.
Fisher ES, Wennberg DE, Stukel TA, Gottlieb DJ, Lucas FL, Pinder EL. The implications of regional variations in Medicare spending. Part 2: health outcomes and satisfaction with care. Annals of Internal Medicine. Feb 18 2003;138(4):288-298.
By far, the most significant factor associated with how much Medicare spends in any given region is the availability of medical resources. Studies from the Dartmouth Atlas Project have shown that the frequency with which physicians admit patients with chronic diseases to the hospital is highly correlated
with the number of beds per capita in the region. The frequency of visits to medical specialists is correlated with the

number of specialists available. And the frequency with which chronically ill patients undergo many diagnostic tests and procedures also varies. We call such procedures and tests, along with the rates of hospitalization and physician visits, "supply-sensitive" care, or care that varies with the local availability of such medical resources as physicians, hospital beds, intensive care unit (ICU) beds, and diagnostic imaging equipment. The volume of supply-sensitive care that is delivered to the chronically ill is a powerful force driving Medicare spending. The utilization of supply-sensitive services for treating the chronically ill varies dramatically across different regions of the country, and it is responsible for much of Medicare spending. Local capacity, or the local supply of medical resources per capita, varies widely, and this local capacity bears directly on how much care is used to treat the chronically ill.

Wennberg JE, Fisher ES, Goodman DC, Skinner JS. "Tracking the care of patients with severe chronic illness." The Dartmouth Atlas of Health Care 2008. Available at: http://www.dartmouthatlas.org/downloads/atlases/2008_Chronic_Care_Atlas.pdf Accessed on February 14, 2011.

IM2.4. Summary of data on disparities by population group:

Health disparities are defined as differences in the occurrence, frequency, death and burden of diseases and other unfavorable health conditions that exist among specific population groups1. Examining health care differences or gaps experienced by one population compared to another is an integral part of understanding and improving health care quality2. The quality of healthcare delivered within the United States also differs from population to population due to differences in access to care, healthcare utilization and other factors2.

Measures of healthcare utilization allow for a broader understanding of access to care2. Barriers to care that are associated with differences in healthcare utilization may have a more significant impact on healthcare quality than other factors2. Several studies on disparities have relied upon measures of healthcare utilization and the data demonstrates some of the most significant differences in care among diverse groups2. Current efforts to improve healthcare delivery continue to rely upon measures of health care utilization to fully understand the complexities surrounding disparate health care outcomes. For example, greater utilization of services does not necessarily indicate better care. In fact, high use of some inpatient services may reflect compromised access to outpatient health services2.

In 2006, the Nation's 14 million health service workers provided approximately 960 million office visits, 673 million hospital outpatient visits, treated 37 million hospitalized patients and 1.4 million nursing home residents2. Approximately 70% of the non-institutionalized civilian population visited a provider's medical office or outpatient facility and about 60% received a prescription medication2. National health expenditures totaled over $2 trillion dollars in fiscal year 2006 with 5% of the population accounting for 55% of total costs2. Additionally, almost one-third of all healthcare expenditures are estimated to be the result of low-quality care, including overuse, misuse and waste2. Utilization resource measures provide a mechanism to better understand healthcare delivery patterns in order to improve the health of all population groups.

The cost and use measures included in this submission will provide an approach to assessing disparities. For example, episode-based measures of cost and use can be employed to create severity-adjusted comparisons of the resources expended in treating cardiovascular conditions, including supporting a focus on the condition-related resources.

IM2.5. Citations for data on disparities cited in IM2.4:

1. Health Disparities in the United States: Facts and Figures, American Society of Clinical Oncology, 2009
2. National Healthcare Disparities Report, U.S. Department of Health & Human Services, Agency for Healthcare Research and Quality, 2008

IM3. Measure Intent

IM3.1. Describe intent of the measure and its components/ Rationale (including any citations) for analyzing variation in resource use in this way

1c

As noted in IM2.1, the intent of the measure and its components is to support:
-- The understanding of opportunities to improve the efficiency of healthcare, in particular for patients with selected conditions. Reducing unwarranted variation will provide an opportunity to decrease resources expended without a significant impact on quality of care and outcomes. In some cases, outcomes may improve due to the decrease in the provision of unnecessary services and
-- Measurement of the value delivered by individual providers, provider groups, and delivery systems – in particular the

H☐ M☐ L☐ I☐

resources expended in care delivery. A number of current initiatives require a valid and robust approach to resource measurement, including medical homes, value-based payment and accountable care organizations (ACOs). The ETG episode methodology described in this submission provides a solid foundation to support such measurements. The resource cost and use measures included in this submission provide actionable insights into relative performance and opportunities for improvement.	
IM4. Resource use service categories are consistent with measure construct *Refer to IM3.1. & all S9 items to evaluate this criteria.*	**1d** **H☐** **M☐** **L☐** **I☐**
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Importance to Measure and Report?*	
Steering Committee: Was the threshold criterion, *Importance to Measure and Report*, **met?** **Rationale:**	**Y☐** **N☐**

SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented.

MEASURE SPECIFICATIONS

S1. Measure Web Page:
Do you have a web page where current detailed measure specifications can be obtained?

No

Eval Rating 2a1/2b1

S2. General Approach
If applicable, summarize the general approach or methodology to the measure specification. This is most relevant to measures that are part of or rely on the execution of a measure system or applies to multiple measures.

All of our submitted measures for Non-Condition Specific Population analysis rely on a foundation of per member per month or per 1,000 per year metrics, risk adjusted using the Episode Risk Group (ERG) methodology. ERG uses an individual's episodes of care, defined using Episode Treatment Groups (ETGs), to assess their relative risk for healthcare cost and use. The approach involves: (1) identifying individuals to be included in the resource use measurement; (2) collecting and assembling data on the health care services (service history) consumed by these individuals over a defined 12-month period; (3) using the diagnostic and procedural information from this service history to categorize each individual's mix of diseases and clinical conditions and using this mix and the ERG methodology to assess relative health risk; (4) using the 12-month service history to summarize each individual's medical and pharmacy cost and utilization, overall and by type of service; and (5) creating risk adjusted measures of cost and use, risk-adjusted using each individual's ERG results. The attached General Methods documents, ETG General Methods Construct Logic and ERG General Methods Construct Logic, provide a high level explanation of the ETG and ERG concepts. The remainder of this submission provides details on the further steps involved in creating the submitted measures.

Attachment: ETG_ERG_ConstructLogic FINAL.doc

S3. Type of resource use measure:

Per capita (population- or patient-based)

S4. Target Population:

Adult/Elderly Care
Children's Health
Maternal Care
Populations at Risk
Special Healthcare Needs

S4.1. Subject/Topic Areas:

S4.2. Cross Cutting Areas *(HHS or NPP National health goal/priority)*

Care Coordination
Overuse
Population Health

S5. Data dictionary or code table
Please provide a web page URL or attachment if exceeds 2 pages. NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less.

Data Dictionary:

URL:
Please supply the username and password:
Attachment: S5_Population_DataDictionary.xls

Code Table:

URL:
Please supply the username and password:
Attachment: S5_Population_DataDictionary-634369196771301067.xls

S6.Data Protocol (Resource Use Measure Module 1)
The measure developer must determine which of the following data protocol steps: data preparation, data inclusion criteria, data exclusion criteria, and missing data, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

Data Protocol Supplemental Attachment or URL:
If needed, attach document that supplements information provided for data protocol for analysis, data inclusion criteria, data exclusion criteria, and missing data (Save file as: S6_Data Protocol). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.

URL:
Please supply the username and password:
Attachment: S6_DataProtocol-634369196961614785.xls

S6.1. Data preparation for analysis
Detail (specify) the data preparation steps and provide rationale for this methodology.

Guidelines : Administrative medical and pharmacy claims, member enrollment and demographic information and provider characteristics describe the primary data sources used in creating ETG episodes of care and measures of resource use per episode. The key data elements required to support ETG processing and the creation of resource use

per episode measures are detailed in attachment S6_DataProtocol.

General recommendations for preparing data for ETG processing and the creation of resource use sub-measures are as follows:

-- The data for all required elements should be complete, valid and consistently populated. In particular:
-- Only final claims should be included in processing. Adjustments and pended/non-fully adjudicated claims should be removed;

-- All recorded diagnosis, procedure and NDC codes should be included and conform to standard ICD-9, HCPCS, CPT, NUBC revenue code and NDC coding conventions. Any non-standard, or "local" codes should be cross-walked to a valid code;

-- An assessment of the relative validity of diagnosis and procedural coding should be made. If significant differences in the prevalence or validity of diagnosis and procedural coding are observed across populations, data sources or administrative claims systems, these discrepancies should be validated and addressed, if relevant. If systematic discrepancies and data issues are the result of incomplete data, the members impacted by the incomplete information should be excluded from processing and measurement. An example is a defined population with significant evidence of missing or invalid coding or a population where primary care capitation is in place and claims or encounters for those services are not available;

-- Financial fields should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example;

-- An assessment of the relative validity of the financial information should be made. Systematic gaps in financial data should be validated and if resulting from incomplete data, the members impacted by the incomplete information should be excluded from processing. An example is a defined population with significant evidence of missing or invalid financial data where options are not available to estimate the financial amounts;

-- Inpatient facility claims should accurately represent the admission and discharge dates for the inpatient stay. Interim facility bills where the patient has not been discharged should reflect the time period of the services rendered and captured on the interim bill.

-- The member IDs used to identify a member should be unique – describing an individual member. The member ID field across claims and membership should follow the same format. Duplicate IDs for a member are not recommended;

-- Each member enrollment record should describe a unique enrollment span, that is, the input data includes one row per member for each continuously enrolled period where the member has consistent attributes. A member may have multiple enrollment records reflecting a gap in enrollment or a change to their member attributes (i.e. PCP or Pharmacy Benefit) over time.

-- It is recommended that member enrollment span overlaps are reconciled prior to processing;

-- A member's pharmacy benefit status should be noted and reflects whether or not the member has pharmacy data generally available for use in measurement. Examples of populations where pharmacy data may not be available include the individual not have pharmacy coverage for the defined enrollment period or pharmacy services managed by a pharmacy benefits manager (PBM) and the PBM data has not been integrated with the medical claims;

-- The provider IDs used to identify a provider should be unique – describing an individual physician or other provider. The provider ID field across claims and membership (Assigned PCP) should follow the same format. Duplicate IDs for a provider are not recommended;

-- Each provider ID should be assigned a specialty that reflects the primary specialty of the provider. This information is used to support valid episode grouping and also to assign providers to an appropriate peer group to support episode analysis;

-- A place of service crosswalk table that maps each native place of service code to a standard format is required. Ingenix valid values include:
-- 11 – Office
-- 12 – Home
-- 21 – Inpatient Hospital
-- 22 – Outpatient Hospital
-- 23 – Emergency Room, Hospital
-- 24 – Ambulatory Surgical Center
-- 31 – Skilled Nursing Facility
-- 39 – Nursing Home, Custodial, Hospice
-- 49 – Ambulance
-- 51 – Inpatient Psychiatric Facility
-- 59 – Psychiatric Facility
-- 61 – Comprehensive Inpatient Facility
-- 69 – Rehab Facility
-- 81 – Independent Lab
-- 99 – Unknown or Other (this POS value should represent a small portion of the data for optimal results)
-- Provider Specialty on claims should accurately reflect the service category of the claim and support assignment of ETG Type of Provider for each claim. Type of Provider values used to support ETG processing include:
-- 0 – Clinician
-- 1 – Facility
-- 2 – Other
- Place of Service, Provider Specialty, CPT/HCPC Procedure Codes and Revenue codes should be accurate and support assignment of ETG Type of Service for each claim. Type of Service values used to support ETG processing include:
-- 0 – Ancillary
-- 1 – Medical/Surgical
-- 2 – Room and Board

S6.2.Data inclusion criteria
Detail initial data inclusion criteria and rationale(related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : For the application of ETG episode logic and the measurement of ERG risk, these methodologies accept all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG and ERG methodologies do not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers and invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

In terms of resource use measure construction following ETG and ERG grouping, no additional data inclusion or exclusion are applied.

S6.3. Data exclusion criteria
Detail initial data exclusion criteria and rationale (related to claim-line or other data quality, data validation, e.g. truncation or removal of low or high dollar claim)

Specifications : For the application of ETG episode logic and the measurement of ERG risk, these methodologies accept all claims for initial processing provided the input format is correct and required fields are provided (refer to section S6.1 for data preparation details and considerations). The ETG and ERG methodologies do not truncate or eliminate service records based on any cost or other criteria. The identification of financial cost outliers and invalid information at the service level is performed by the organization preparing the input data. As noted in S6.1, financial amounts on individual service records should be validated prior to their use in measurement.

S6.4. Missing Data
Detail steps associated with missing data and rationale(e.g., any statistical techniques used)

Specifications : The non-condition, population-based resource use measure described in this submission uses measures of ERG risk to support risk adjustment of resource use comparisons. As described in the overview of the ERG

methodology (section S2), the ETG methodology plays an important role in estimating ERG risk. ETG does include a methodology for working with incomplete and missing information. Two other issues related to missing or incomplete data that are considered by ETG and the ERG-adjusted resource measures submitted: (i) approaches that leverage available clinical information where other information is missing and (ii) adjusting for missing pharmacy data in creating comparable measures.

In terms of working with missing information during the episode grouping process, ETG uses the following approaches:

-- Missing Diagnosis Codes: If all four diagnosis codes are missing from a non-pharmaceutical claim the ETG application will use the procedure code to group, except when the procedure code requires a valid diagnosis code to be present. This requirement is per the ETG eligibility table. In cases where all diagnosis codes are missing and the procedure requires a valid diagnosis code to also be present, the service record will not group and will be assigned to an error ETG. As described in the general description of the ERG methodology in the attachment to S2, since ERG builds from an individual's mix of ETG episodes, if a service record cannot contribute to ETG grouping due to missing data, it also cannot contribute to ERG risk measurement.

-- Missing Procedure Codes: If there is no procedure code on a service record then the record will group based on the diagnosis codes or NDC drug code. If there is no diagnosis, procedure or pharmacy code on the claim, then the claim will not group and will have an error code assigned to it.

The services not assigned to an episode following these steps and noted as errors based on missing data would not be included in a specific clinical episode or therefore will not be available for use in triggering clinical risk markers in ERGs.

-- Missing Pharmacy Data: For some members and populations, pharmacy data can be missing generally, due to the different factors, including not having a pharmacy benefit with the entity collecting the data used in measurement or pharmacy services being managed by a pharmacy benefits manager (PBM) for the measurement entity. Where pharmacy data are not generally available for a member, adjustments are required to ensure valid comparisons.

The ETG grouping and ERGs do not require pharmacy data. ETG treats pharmacy services as ancillary records - these records cannot start an episode for a clinical condition. However, missing pharmacy records will impact the observed cost and use for a member – which will be underestimated, on average, where pharmacy data are missing. It is recommended that pharmacy benefit/data status be used as a separate category in risk adjusting pharmacy and total costs per member per month. For example, the expected or "peer" results for a physician should reflect their mix of members with and without pharmacy benefits/data.

Finally, the population-based measure described here employ a 12 month measurement period. For some measures, enrollment and claims data may not be available for this full time period, either due to the member enrolling or dis-enrolling sometime during the 12 months. The submitted measure continues to include members with partial enrollment during the 12 month period, adjusting for their tenure in member months using a per member per month (PMPM) or per 1,000 members per year calculation.

Eval Rating 2a1

H☐ M☐ L☐ I☐

Eval Rating 2b1

H☐ M☐ L☐ I☐

S7. Data Type: Administrative claims
Other

S7.1. Data Source or Collection Instrument
Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc.)

Both medical and pharmacy administrative service records (claims or encounters) are used to support the measures. Member enrollment span, pharmacy benefit status and age and gender are also required. Provider characteristics, including specialty and unique provider identifier also have importance to support attribution and definition of peers.

S7.2. Data Source or Collection Instrument Reference
(Please provide a web page URL or attachment). NQF strongly prefers URLs. Attach documents only if they are not available on a web page and keep attached file to 5MB or less)

URL:
Please supply the username and password:

Attachment: S7.2_Data Source Reference-634369198947096242.xls

S8.Measure Clinical Logic (Resource Use Measure Module 2)
The measure's clinical logic includes the steps that identify the condition or event of interest and any clustering of diagnoses or procedures. For example, the diagnoses and procedures that qualifies for a cardiac heart failure episode, including any disease interaction, comorbid conditions, or hierarchical structure to the clinical logic of the model. (Some of the steps listed separately below may be embedded in the risk adjustment description, if so, please indicate NA and in the rationale space list 'see risk adjustment details.')

Clinical Logic Supplemental Attachment or URL:
If needed, provide a URL or document that supplements information provided for the clinical framework, co-morbid interactions, clinical hierarchies, clinical severity levels, and concurrency of clinical events

URL:
Please supply the username and password:
Attachment: S8_Population_ClinicalLogic.xls

S8.1. Brief Description of Clinical Framework
Briefly describe your clinical logic approach including clinical topic area, whether or not you account for comorbid and interactions, clinical hierarchies, clinical severity levels and concurrency of clinical events.

The clinical underpinnings of this non-condition measure are based on the relative health risk for an individual. This health risk relates to the relative expectation around the individual's healthcare expenditures and use – a higher level of risk is expected to correlate with a greater use of healthcare and healthcare costs. Episode Risk Groups (ERGs) is the risk assessment methodology used to measure risk for the submitted measures. ERG is based on the observed episodes of care for the individual, as created by Episode Treatment Groups (ETG).

As described in the overview of ETG and ERG provided in the attachment to S2, ERG relies on ETG as the foundational element. A member's ETG episodes observed during the year provide the starting point for ERGs. ETG describes the unique clinical conditions for an individual and the services involved in their diagnosis, management and treatment. ETG also assigns a severity score and severity level to each condition episode – deriving from the condition status factors and co-morbidities observed for the condition. A member's ETGs and severity are then mapped to create an ERG array for the individual. The mappings of ETG and severity levels to the corresponding ERG are described in the worksheet "ERG-ETG List" within the attachment S5_Population_DataDictionary. Each element of the ERG array is assigned a weight that describes the incremental contribution of that ERG marker on health risk. Finally, an ERG risk score is translated to an ERG risk level, using discrete ranges of risk (e.g., a relative risk score between 0.0085 and 0.0695 is assigned to ERG risk category 1. ERG risk category ranges are described in the worksheet "ERG Risk Categories" within the attachment S5_Population_DataDictionary.

The attachments to S2 and S5 provide greater detail on ERG.

S8.2. Clinical framework
Detail any clustering and the assignment of codes, including the grouping methodology, the assignment algorithm, and relevant codes and rationale for these methodologies.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG).

ERGs describe the relative health risk for a member in terms of current or future health care expenditures. ERG uses the episodes of care created by ETG as building blocks, including what condition episodes are observed and their severity. The nature and mix of episodes provide a clinical profile for a member that can serve as a marker of their current and future need for medical care.
A high-level overview of the ERG logic is as follows:
1. Translate ETGs into ERGs

2. Generate ERG Profile (a member's demographic characteristics and observed mix of ERG)
3. Calculate ERG Risk Score

Step 1: Translate ETGs into ERGs

The results from an ETG grouping of 12 months of medical and pharmacy services provide the inputs for ERGs. In particular, service records that have been grouped into ETGs for a single year are used as the condition identifiers for the member. The ETG base class and the Severity Level assigned to each claim record are elements used to associate an ETG to an ERG. Base ETG and Severity Level play an important role in assigning ERGs to an individual. As a rule, ERGs are not differentiated using a treatment indicator. However, the active management status of malignant neoplasm ETGs (triggered by the presence of radiation therapy or chemotherapy) is the exception. ERG assignment is not dependent on episode completion status or outlier status. ERG assignment does not vary with the number of episodes or ETGs observed for a member within the same ERG. Members with single or multiple episodes within an ERG receive identical assignments.

The attachment "S5_Population_DataDictionary" and tab "ERG-ETG List" includes the entire mapping and hierarchies used to translate ETGs into ERGs.

The table entries for Diabetes provide an example of how the ETG values are translated into an ERG. The Base ETGs for the Diabetes ERGs (163000 for Diabetes and 901300 for Diabetes Rx Agents, e.g., insulin) describe the observed condition. The Severity Level denotes the level of episode severity, with greater severity indicating a higher level of expected resources required. The different combinations of ETG and severity level trigger an ERG marker. Note that hierarchies are applied to ensure that only one ERG marker from a related clinical family is triggered. The hierarchy below is 0202 (for Diabetes), with a Priority value for each Base ETG and Severity Level. The lower value indicates a higher ranked Priority. Only the Base ETG and Severity Level combination with the lowest value for Priority is retained if more than one combination in the Hierarchy is observed.

In summary, an individual's ETG episodes and their severity determine their ERGs. Hierarchies are employed to ensure only the most significant episode in the hierarchy is used to trigger an ERG. With the exception of malignant neoplasm ETGs, medical treatments observed within the episode are not used in determining an individual's ERGs.

Step 2: Generate ERG Profile

A member's age, gender and mix of ERGs are used to create their ERG profile. Every member is assigned to an age-sex group, using ten age groups: 0-5, 6-11, 12-18, 19-34, 35-44, 45-54, 55-64, 65-74, 75-84 and greater than 84. Members without claims will have no episodes and no ERGs. For these members, risk is based solely on age and gender. Members with claims are assigned to one or more ERGs depending on their mix of episodes of care.

ERG Timing

The ERG models were developed using up to 12 months of data to measure relative health risk for the same 12 month prediction period (retrospective risk) or a future 12 month prediction period (prospective risk).

ERG uses ETG assignments for medical and pharmacy services in the latest 12 month period of the ETG grouping. This 12 month period is called the experience period—the period of time during which markers of member health risk are collected and used to measure retrospective and prospective risk. If more than 12 months of claims are grouped, ERG only uses the most recent 12 months of data.

Step 3: Calculate ERG Risk

Calculating risk involves the assignment of a weight to each ERG and demographic marker of risk. These weights describe the contribution to risk of being in a specific age-sex group or having a particular medical condition included in an ERG. The model of risk can be defined generally as:

$RiskPi = ?as*AGESEXi,s + ?be*ERGi,e$

$RiskRi = ?ce*ERGi,e$

where RiskPi and RiskRi are the ERG prospective and retrospective risk scores for person i; AGESEXi,s and ERGi,e indicate their age-sex group (s); and ERG assignments (e), and the a's, b's and c's are the risk weights. The age-sex and ERG markers are set to 1 if the marker is observed for an individual, 0 if not. Each member has their own profile of age-sex and ERGs. However, for each ERG model, the risk weights are pre-defined and are the same for all individuals. A person's risk score is the sum of these risk weights for each marker observed.

The ERG development data were obtained from the Ingenix Impact National Database, which includes information from over 40 health plans in nine different geographic census regions. The risk weights for Episode Risk Groups (and the pure age-gender model) were created using multiple linear regression and recent enrollment and medical and pharmacy claims data. The risk weights represent the relative costs per member per month (PMPM) associated with being in a specific age-gender group or having a particular medical condition included in an ERG.

Input Data/Model Outcome

The weights associated with the ERG risk markers vary depending on both the availability of data for use as input and the services to be included in predicted risk. A population which has been grouped with pharmacy data included will likely produce a somewhat different portrait of risk than the same population without pharmacy data. To obtain the most precise measures of risk, ERG offers 2 model options (medical or medical and pharmacy) depending on whether pharmacy claims are available for a given member. The ERG risk markers included in these model options are identical, however the ERG risk weights differ according to which model option is selected.

In most applications of ERG, the risk associated with the cost of all health care services, including both medical and pharmacy services are desired. However, in some applications predicting risk for only medical services may be important. To support this flexibility, ERG also offers options related to the risk outcome: medical and pharmacy services, or medical services only.

Expenditure Thresholds

Expenditure threshold describes the level at which a higher-cost member´s annual expenditures might be truncated for an application (truncation refers to capping a member´s annual costs at some level prior to analysis). ERG offers three options for annual member threshold levels: $25,000, $100,000, and $250,000. As with the other model options described above, the ERG risk markers included in threshold options are identical, however the ERG risk weights differ. In particular, the risk weights for the three options were derived using different threshold assumptions for the members included in the database used for developing the models. The selection of the expenditure threshold to use in the assessment of relative resource use depends on the application. As a default, most applications of resource use measurement for the submitted measures employ the $100,000 threshold model.

Length of Enrollment

A member´s length of enrollment may affect the number and mix of episodes of care observed. This will ultimately affect the ERG risk markers assigned and risk scores generated by the ERG models. Partial enrollment reflects the number of days a member was enrolled during the experience period and a risk weight assignment for the ERG array is based on that length of time. All ERG models utilize partial enrollment to determine the weights used in computing risk.

With this approach, ERG will apply 1 of 4 separate sets of risk weights that correspond with the member´s length of enrollment during the 12-month experience period. The enrollment periods are categorized on worksheet “ERG Enrollment Periods” within the S8_Population_ClinicalLogic attachment.

Risk will also be impacted by whether the member is an elderly or non-elderly individual, due to the different implications of a disease or co-morbidity on the overall level of risk for these members. Empirical testing during ERG development supported this premise. As a result, separate sets of ERG weights are used for individuals under 65 than for those aged 65 or greater. Although different weights are used, the same set of risk markers are employed for elderly and non-elderly individuals.

The input data, model outcome, and expenditure threshold data elements are supplied in the member demographics data as input into ERG. The length of enrollment is determined during ERG processing, using the supplied member eligibility dates.

ERG Risk Models and Features

ERG provides significant flexibility for supporting a variety of business applications. The attachment for S2 provides details on the different models. As a guideline, the Retrospective ERG risk model, $100,000 threshold, is used to support the risk adjustment for the submitted measures. The “Medical/Medical-RX” model weightings are applied for individuals without a pharmacy benefit or without general pharmacy data availability. The “Medical-RX/Medical-RX” model weightings are applied for individuals with a pharmacy benefit/with general pharmacy data availability.

The attachment for S2 also includes a table with an example of how ERG risk scores are computed for a single member.

S8.3. Comorbid and interactions

Detail the treatment of co-morbidities & disease interactions and provide rationale for this

methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG). S8.2 also describes the ERG approach.

Co-morbidities, hierarchies and interactions for ERGs are all captured by the ERG methodology, with the ETG methodology serving as the foundation for categorizing these clinical dimensions. ERG recognizes a member's full range of co-morbidities and will add incremental weight to an individual's ERG risk score where additional co-morbidities have been observed. For example, an individual with episodes observed for Diabetes and CHF will receive a higher ERG risk score than an individual observed with Diabetes alone. Further, interactions between conditions are also captured by ERG through the use of the Severity Level methodology provided by ETG. As described in the attachment for S2, ETG uses Severity Level to classify episodes based on risk – where a higher Severity Level indicates an episode with a significant co-morbidity. For example, ETG will assign an episode of Diabetes where a co-morbidity of CHF has been observed to a higher level of severity (e.g., Severity Level 3). ERG will map a Diabetes, Level 3 episode to a higher risk ERG marker – capturing both the presence of Diabetes and the interaction with CHF. The ERG marker for CHF will also receive the same treatment.

The attachment "S5_Population_DataDictionary" and tab "ERG-ETG List" includes the entire mapping and hierarchies used to translate ETGs into ERGs, including how Severity plays a role in ERG assignment.

S8.4. Clinical hierarchies
Detail the hierarchy for codes or condition groups used and provide rationale for this methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG), including clinical hierarchies in mapping ETGs to ERG risk markers. S8.2 also provides further discussion.

The results from an ETG grouping of 12 months of medical and pharmacy services provide the inputs for ERGs. In particular, service records that have been grouped into ETGs for a single year are used as the condition identifiers for the member. The ETG base class and the Severity Level assigned to each claim record are elements used to associate an ETG to an ERG. Base ETG and Severity Level play an important role in assigning ERGs to an individual. As a rule, ERGs are not differentiated using a treatment indicator. However, the active management status of malignant neoplasm ETGs (triggered by the presence of radiation therapy or chemotherapy) is the exception. ERG assignment is not dependent on episode completion status or outlier status. ERG assignment does not vary with the number of episodes or ETGs observed for a member within the same ERG. Members with single or multiple episodes within an ERG receive identical assignments.

The attachment "S5_Population_DataDictionary" and tab "ERG-ETG List" includes the entire mapping and hierarchies used to translate ETGs into ERGs.

The table entries for Diabetes provide an example of how the ETG values are translated into an ERG. The Base ETGs for the Diabetes ERGs (163000 for Diabetes and 901300 for Diabetes Rx Agents, e.g., insulin) describe the observed condition. The Severity Level denotes the level of episode severity, with greater severity indicating a higher level of expected resources required. The different combinations of ETG and severity level trigger an ERG marker. Note that hierarchies are applied to ensure that only one ERG marker from a related clinical family is triggered. The hierarchy below is 0202 (for Diabetes), with a Priority value for each Base ETG and Severity Level. The lower value indicates a higher ranked Priority. Only the Base ETG and Severity Level combination with the lowest value for Priority is retained if more than one combination in the Hierarchy is observed.

In summary, an individual's ETG episodes and their severity determine their ERGs. Hierarchies are employed to ensure only the most significant episode in the hierarchy is used to trigger an ERG. With the exception of malignant neoplasm ETGs, medical treatments observed within the episode are not used in determining an individual's ERGs.

S8.5. Clinical severity levels
Detail the method used for assigning severity level and provide rationale for this methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG), including using ETG clinical severity levels and the ERG Risk Levels produced by ERGs. Also, please see the discussion for S8.2. Clinical Severity Levels are an integrated component of deriving an individual's array of ERGs and their ERG level of risk.

S8.6. Concurrency of clinical events (that may lead to a distinct measure)
Detail the method used for identifying concurrent clinical events, how to manage them, and provide the rationale for this methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG). S8.2 and S8.3 also provide a discussion of the clinical framework, including the recognition of multiple clinical conditions and their interaction in measuring risk.

S9. Measure Construction Logic (Resource Use Measure Module 3)
The measure's construction logic includes steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic. For example, any temporal or spatial (i.e., setting of care) parameters used to determine if a particular diagnosis or event qualifies for the measure of interest.

Construction Logic Supplemental Attachment or URL:
If needed, attach supplemental documentation (Save file as: S9_Construction Logic). All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.)

URL:
Please supply the username and password:
Attachment:

S9.1. Brief Description of Construction Logic
Briefly describe the measure's construction logic.

Please refer to the attachments to S2 and S5 for a description of the clinical framework for Episode Risk Groups (ERG).

S9.2. Construction Logic
Detail logic steps used to cluster, group or assign claims beyond those associated with the measure's clinical logic.

All of the submitted measures for Non-Condition Specific Population analysis rely on a foundation of per member per month or per 1,000 per year metrics, risk adjusted using the Episode Risk Group (ERG) methodology. ERG uses an individual's episodes of care, defined using Episode Treatment Groups (ETGs), to assess their relative risk for healthcare cost and use. The approach involves: (1) identifying individuals to be included in the resource use measurement; (2) collecting and assembling data on the health care services (service history) consumed by these individuals over a defined 12-month period; (3) using the diagnostic and procedural information from this service history to categorize each individual's mix of diseases and clinical conditions and using this mix and the ERG methodology to assess relative health risk; (4) using the 12-month service history to summarize each individual's medical and pharmacy cost and utilization, overall and by type of service; and (5) creating risk adjusted measures of cost and use, risk-adjusted using each individual's ERG results. The attached General Methods document (for S2), ETG_ERG General Methods Construct Logic provide a high level explanation of the ETG and ERG concepts.

S9.3. Measure Trigger and End mechanisms
Detail the measure's trigger and end mechanisms and provide rationale for this methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG). Trigger and end mechanisms are not applicable to ERGs. There are no specific trigger and end mechanisms for the population-based measures described, other than the definition of a 12-month period (reporting period) used for the measurement. The population being measured is not specific to any condition or disease.

S9.4.Measure redundancy or overlap

Detail how redundancy and overlap of measures can be addressed and provide rationale for this methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG), including the use of clinical hierarchies. S8.2 and S8.3 also provide a discussion of the clinical framework, including the recognition of multiple clinical conditions and their interaction in measuring risk.

S9.5.Complementary services

Detail how complementary services have been linked to the measure and provide rationale for this methodology.

The attachments to S2 and S5 provide a description of the clinical framework for Episode Risk Groups (ERG), including the use of clinical hierarchies. Complementary services are not applicable to ERGs.

S9.6.Resource Use Service Categories

Inpatient services: Inpatient facility services
Inpatient services: Admissions/discharges
Ambulatory services: Outpatient facility services
Ambulatory services: Emergency Department
Ambulatory services: Pharmacy
Ambulatory services: Evaluation and management
Ambulatory services: Procedures and surgeries
Ambulatory services: Imaging and diagnostic
Ambulatory services: Lab services

S9.7.Identification of Resource Use Service Categories

For each of the resource use service categories selected above, provide the rationale for their selection and detail the method or algorithms to identify resource units, including codes, logic and definitions.

The following resource-use categories are included as measures for this submission.

Cost of Care per Member per Month
-- Total
-- Primary Care Core Services, Total
-- Primary Care Core Services, Visits
-- Primary Care Core Services, Other (Non-Visits)
-- ER Services
-- Hospital Services, Total
-- Inpatient Acute
-- Inpatient Non-Acute
-- Other Outpatient
-- Laboratory Services
-- Radiology Services, Diagnostic, Total
-- Radiology, MRI, CT Scan Services
-- Radiology, Other Diagnostic Services
-- Specialty Care Services, Total
-- Specialty Care, Other Diagnostic Testing Services
-- Specialty Care, Evaluation & Management Services
-- Specialty Care, Medicine Services
-- Specialty Care, Surgery Services
-- Specialty Care, Other Services
-- Pharmacy Prescription Services

Utilization, Annualized per 1,000
-- PCP Visits
-- Specialist Visits
-- Specialist Referrals
-- Total Evaluation & Management Visits
-- ER Visits
-- Hospital Inpatient Admits, Acute
-- Hospital Inpatient Days, Acute
-- Laboratory Services
-- Radiology Services, Diagnostic, Total
-- Radiology Services, MRI/CT Scan Services
-- Radiology Services, Other Diagnostic Services
-- Pharmacy Prescriptions Services

Each resource use category measure is described below, including reference to the specific codes and logic used to identify the services involved.

I. General Methods

In terms of general methods employed across measures, the following approaches are used:
-- Service cost – as a guideline, the service cost used in resource use measurement should reflect the actual payments or costs associated with the service or a standard-priced resource cost amount. As a further guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example.

-- Time periods – as a guideline, the services and member months included in these resource use measures should focus on a specific 12 month period, for example, services and enrollment during a calendar year.

-- Type of Service. The type of service logic for each measure is described in the sections below. Each type of service definition includes an overview of the key steps used in identifying the relevant services used in measuring cost and utilization. As an initial step, prescription pharmacy services and hospital inpatient confinements are identified (more detail below). For the remaining services:

a. Providers are categorized into facility, anesthesiology specialties and other professional (not anesthesiology);
b. The attached document S9.7_RU_Categories then describes two levels of specifications used in assigning services to a type of service category;
c. The first table in the attachment IMAP_TOS_PROC includes one row per procedure code (CPT, HCPCS, Revenue). For each row, the table includes the procedure code, a short description and the columns PROFTOS, ANESTOS, OPTOS, and PCC_TYPE. PROFTOS, ANESTOS, OPTOS include standard TOS_I codes that are assigned to each procedure code based on whether the provider is a facility, anesthesiologist or other professional, using OPTOS, ANESTOS and PROFTOS, respectively;
d. Some services are also assigned a value for PCC_TYPE (described below);
e. The second table, IMAP_TOS, includes one row for each of the standard TOS codes included in PROFTOS, ANESTOS and PROFTOS and columns for the TOS_I codes, ENC_TOS, and ENC_TOP and a brief description of the TOS_I. ENC_TOS and ENC_TOP are used in defining encounters below.
f. These two tables are used in creating the measures described below.

-- Encounters. An Encounter is contact between an individual and the health care system for a related set of services. It is based on the type of service and the type of provider for a member on a specific day. Providing the ability to view data by encounters helps convey the scope and influence of all services associated with patient-health care system meetings. The concept of an encounter is used for the utilization measures described below. The following steps are used to assign an encounter value to each service record:
a. Hospital inpatient admissions. A hospital inpatient confinement is considered a single encounter (ENCOUNTER=1).
b. Prescription pharmacy. A pharmacy service record (claim record) is considered a single encounter (ENCOUNTER=1).
c. Ancillary Drug Administered Services. All Ancillary, Drugs Administered (TOS_I values 201 thru 211), are considered an encounter (ENCOUNTER=1).

d. For all other services, the number of encounters is dependent on the Type of Service and the Type of Provider assigned to the claims. In particular, the values included in the table IMAP_TOS for Encounter Type of Service (ENC_TOS) and Encounter Type of Provider (ENC_TOP) are used. As shown in IMAP_TOS, both the Encounter TOS and Encounter TOP are based on Type of Service (TOS_I) and can be assigned using table IMAP_TOS, and joining on TOS_I from the service record.
e. For these other services, medical service records are sorted by Member, Date of Service, ENC_TOS and ENC_TOP.
f. The calculation of encounters for services other than emergency room, laboratory and radiology services is 1 divided by the total number of records in the combination of Member, Date of Service, Encounter TOS, and Encounter TOP.
g. Additional logic. Emergency room, laboratory and radiology services need to have a different logic because these services often are billed using both a technical and professional component – where both a professional provider and facility provider are involved.
h. Any service with the following Encounter TOS values will use the additional logic when calculating encounters.
-- ER professional and facility services (ENC_TOS=24)
-- Lab and pathology professional and facility services (ENC_TOS=29, 31)
-- Diagnostic and therapeutic radiology professional and facility services (ENC_TOS=47, 49)

For the services using the additional logic, for each Member, Date of Service, and ENC_TOS distinct combination, sum the number of records for each of the Encounter TOP values of 1 and 2.

-- Two cases can exist for these services: there are both facility and professional records in the combination; or there are only facility records or only professional records.
-- Where at least one facility record and one professional record, the encounter is divided up equally between the professional and technical components. Therefore, the calculations for Encounters for these situations are: 0.5 divided by {number of records with Encounter TOP = 1 (Facility)} and 0.5 divided by {number of records with Encounter TOP = 2 (Professional)}
-- Where all records have the same ENC_TOP value, the encounters calculation will be the generic calculation: 1 divided by {number of records in the combination of Member, Date of Service, Encounter TOS, Encounter TOP}

-- Cost and Utilization Measures. The actual resource use is the sum of the costs or encounters for those services observed for an individual member. Measures of actual cost or use across members is the sum of cost or use divided by the total number of member months for those members included in the measurement.

II. Cost of Care per member per month

Total Service Costs. Total services costs include the total costs for all services included in the selected members.

Primary Care Core Services Costs. Primary Care Core (PCC) services include a select group of services traditionally performed by an individual's primary care physician. The PCC concept is similar to the idea of the group of services typically included in a primary care capitation definition. In particular, these services include non-inpatient evaluation and management services and selected imaging, diagnostic and minor procedure services. PCC Services are identified as follows:

-- First select services rendered by a primary care provider. The identification of primary care providers can be made configurable. At a minimum, these providers include the individual's assigned PCP. Further, to include covering providers, other primary care providers in the network are included, defined using either a list of provider ids or all physicians with a specialty of internal medicine, family practice, geriatric medicine, adolescent medicine and pediatrics, or both (e.g., using a list to include specific OB/GYN providers in addition to all providers with primary care specialties).

The CPT procedure code on the selected services is then used to identify:
-- PCC Services Total
-- PCC Services, Visits and
-- PCC Services Other.
The CPT procedure codes assigned to these categories are included in the column PCC_TYPE in the attachment table IMAP_TOS_PROC. Values of "Visit" and "Other" are used. Blank entries for a procedure code indicate that they are not included as a PCC service.

ER Service Costs. These services include professional and facility emergency room services.
-- Professional ER Services are identified as having values of 1803 thru 1805 in IMAP_TOS
-- Facility ER Services are identified as having values of 801 and 802 in IMAP_TOS

Hospital Costs. Includes the facility cost of an inpatient stay and services provided by an outpatient facility other than those defined elsewhere (e.g., ER, Lab, Radiology, Other). These services include professional and facility emergency room services.
-- Inpatient Acute Services are identified as having a value of 601 in IMAP_TOS
-- Non-Inpatient Acute Services are identified as having a value of 703 in IMAP_TOS
-- Other Outpatient Hospital Services are identified as having values of 901 thru 1399 in IMAP_TOS

Laboratory Services. These services include professional and facility laboratory services, other than those professional services assigned to Primary Care Core.
-- Professional Lab Services are identified as having values of 2101-2118 (Professional, Lab) or 2501-2511 (Professional, Pathology) in IMAP_TOS
-- Facility LAB Services are identified as having values of 1001 thru 1005 in IMAP_TOS

Radiology Services, Diagnostic. These services include diagnostic professional and facility radiology services, other than those professional services assigned to Primary Care Core:
-- Professional Radiology, MRI, CT Scan Services are identified as having values of 2901 thru 2903 in IMAP_TOS
-- Facility Radiology, MRI, CT Scan Services are identified as having values of 1201, 1203, 1204 in IMAP_TOS
-- Professional Radiology, Other Diagnostic Services are identified as having values of 2905, 2906, 2907, 2908 in IMAP_TOS
-- Facility Radiology, Other Diagnostic Services are identified as having values of 1202, 1206, 1207, 1208 in IMAP_TOS
-- Note that Therapeutic Radiology is included in Specialty Care Services, Medicine

Specialty Care Services. These services include those services not identified above and are categorized as follows (including TOS_I values in IMAP_TOS):
Specialty Care, Other Diagnostic Testing
-- 1701-1733 (Professional, Diagnostic)
Specialty Care, Evaluation & Management
-- 1601-1609 (Professional, Consult)
-- 2001-2013 (Professional, Inpatient Visit)
-- 2401-2411 (Professional, Office Visit)
-- 2717-2719 (Professional, Home Visit)
-- 2729-2731 (Professional, Domiciliary/Rest Home Visit)
-- 2801-2807 (Professional, Preventive Medicine)
-- Excludes any services assigned to Primary Care Core
Specialty Care, Medicine
-- 1401-1405 (Professional, Allergy Tests)
-- 1901-1901 (Professional, Immunizations / Injection)
-- 2909-2915 (Professional, Therapeutic Radiology)
Specialty Care, Surgery
-- 3001-3214 (Professional, Surgery)
Specialty Care, Other
-- 101-131 (Ancillary, DME)
-- 201-211 (Ancillary, Drug Admin)
-- 301-307 (Ancillary, Home Health)
-- 401-403, 431 (Ancillary, Services and Supplies)
-- 405-414 (Ancillary, Med and Surg Supplies)
-- 416-424 (Ancillary, Orthotics)
-- 425-429, 432 (Ancillary, Supplies)
-- 433-436 (Ancillary, Oxygen/Resp)
-- 437-446 (Ancillary, Prosthetics)
-- 448-449 (Ancillary, Vision)
-- 450-459 (Ancillary, Rpt/Trking)
-- 501-503 (Ancillary, Transportation)

-- 1501-1599 (Professional, Anesthesia)
-- 2203-2212 (Professional, Mental Health)
-- 2302-2317 (Professional, Obstetrics)
-- 2601-2625 (Professional, Phys Medicine/Rehab)
-- 2701-2715, 2721-2728 (Professional, Professional Other)

III. Utilization per 1,000

Encounters are used for all utilization counts for the utilization measures described below.

Evaluation and Management Visits. E&M Visit services by all professional providers and include the following TOS_I values from IMAP_TOS:
-- 1601-1609 (Professional, Consult)
-- 1803-1805 (Professional, ER)
-- 2001-2013 (Professional, Inpatient Visit)
-- 2401-2411 (Professional, Office Visit)
-- 2717-2719 (Professional, Home Visit)
-- 2729-2731 (Professional, Domiciliary/Rest Home Visit)
-- 2801-2807 (Professional, Preventive Medicine)

PCP Visits. PCP Visits include E&M visits rendered by a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Visits. Specialist Visits include E&M visits rendered by a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

Specialist Referrals. A Specialist Referral is indicated using E&M visits and indicates the first instance of the Provider for an E&M service for that member. A specialist is a provider other than a PCP or a PCP covering provider (see discussion above for PCC services).

ER Visits. Indicates an ER service encounter. ER services are defined by a TOS_I value of Facility Outpatient, ER (801, 802) or Professional, ER (1803, 1805).

Radiology Services, Diagnostic. Radiology utilization is defined as an encounter for the following Types of Service:
-- MRI/Cat Scans – Facility Outpatient (1201, 1203, 1204), Professional (2901, 2902, 2903)
-- Other Diagnostic Radiology – Facility Outpatient, Diag. Radiology (1202, 1206, 1207, 1208), Professional, Diagnostic Radiology, Nuclear Medicine (2905 thru 2908)

Laboratory Services. Laboratory utilization is defined as an encounter for the following Types of Service:
-- Facility Outpatient, Lab (1001, 1003, 1005)
-- Professional, Lab, (2101 thru 2118)
-- Professional, Pathology (2501 thru 2511)

Pharmacy Services. A pharmacy service prescription record.

If needed, provide specifications URL (preferred) or as an attachment:

URL:
Please supply the username and password:
Attachment: S9.7_RU_Categories-634369201486799996.xls

S9.8. Care Setting; *provides information on which care settings the measure encompasses.*

Ambulatory Care : Ambulatory Surgery Center (ASC)
Ambulatory Care : Clinic/Urgent Care
Ambulatory Care : Clinician Office
Emergency Medical Services

Ambulance
Home Health
Hospice
Hospital/Acute Care Facility
Imaging Facility
Laboratory

S10.Adjustments for Comparability (Resource Use Measure Module 4)
External factors can mingle and affect or confound a measure's result. Confounding occurs if an extraneous factor causes or influences the outcome (e.g., higher resource use) and is associated with the exposure of interest (e.g., episode of diabetes with multiple co-morbidities). Measure developers often include steps to adjust the measure to increase comparability of results among providers, employers, and health plans.

S10.1. Risk adjustment method
Define risk adjustment variables and describe the conceptual, statistical, or other relevant aspects of the model and provide rationale for this methodology.

The attachment for S2 and responses to S5 above provided a description of the approach used by ERG to assign a risk score and risk level to an individual. The attachment for S5, "S5_Population_DataDictionary" and tab "ERG Risk Categories" describe the risk ranges used to assign an individual's ERG risk score to an ERG risk level. The ERG Risk Level determined from an individual's ERG risk score defines the "risk adjustment" unit used for the submitted measures. A higher ERG Risk Level indicates a higher level of risk and a greater expectation around the medical and pharmacy services required for an individual's health care for the 12-month measure reporting period.

Risk adjustment is an important step in resource use measurement. Measures of the cost of care for an organization or provider can be impacted by the underlying risk and severity of the patients they enroll or manage. Case-mix or risk adjustment addresses these differences and supports more consistent and equitable comparisons. These approaches allow a focus on differences in resource use deriving from differences in the practice of medicine rather than differences in the mix of patients.

The level of risk for a patient is used to support risk adjustment. The risk adjustment approach includes three important steps:
-- Compute the observed experience for the provider being measured, across all patients to be included in the comparison;
-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ERG Risk Level. For a peers benchmark, average cost across all peers for the ERG risk level can be computed;
-- Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of patients by ERG risk level. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The attachment S10_Risk Adjustment Method Example Population.xls provides an example comparing the cost of care performance of two internists using ERG risk levels to create a comparison of overall cost PMPM.

In the last column of the example "Relative Cost of Care Ratio" a relative cost ratio less than 1.00 indicates that the observed cost PMPM for a provider is less than his peers. As shown, Dr. Jones cost is lower than peers and Dr. Smith is higher cost than peers. An additional report using the same measure information could summarize results by type of service, or specific utilization such as the use of a specific diagnostic test or treatment, providing greater insights into the factors behind differences in resource use. The risk adjustment for these measures would use the same approach as described here for total cost.

If needed, provide supplemental information via a web URL (preferred) or attachment with the risk adjustment specifications.

URL:
Please supply the username and password:

Attachment: S10_Risk Adjustment Method Example Population.xls

S10.2. Stratification Method
Detail the stratification method including all variables, codes, logic or definitions required to stratify the measure and rationale for this methodology

As described in the attachments for S2 and S5 and the responses for S8, S9 and S10.1, ERG risk and ERG Risk Level are used to stratify individuals for risk adjustment. The methodology can be applied across all individuals. As a guideline, results can be stratified by geographic area or by Payer type, if relevant, where separate measures are created for each strata. The underlying methodologies would be equivalent for each strata, however, benchmarks and comparisons would be made separately by strata.

S10.3. Costing Method
Detail the costing method including the source of cost information, steps to capture, apply or estimate cost information, and provide rationale for this methodology.

The measure does not specify the specific costing method to be used for cost of care resource use measures. The financial amounts used should be complete and valid, reflecting the actual payment or costs associated with the service or a standard-priced resource cost amount. As a guideline, the financial amount used in resource measurement should reflect all payments for a service, including those made to the provider by payer, patient and other entities. The allowed or equivalent payment is an example

S11. Measure Reporting (Resource Use Measure Module 5)
The measure developer must determine which of the following Measure Reporting functions: attribution approach, peer group, outliers and thresholds, sample size, and benchmarking and comparative estimates, are submitted as measure specifications or as guidelines. Specifications limit user options and flexibility and must be strictly adhered to; whereas guidelines are well thought out guidance to users while allowing for user flexibility. If the measure developer determines that the requested specification approach is better suited as guidelines, please select and submit guidelines, otherwise specifications must be provided.

S11.1. Detail attribution approach
Detail the attribution rule(s) used for attributing costs to providers and rationale for this methodology (e.g., a proportion of total measure cost or frequency of visits during the measure's measurement period) and provide rationale for this methodology.

Attributing patients to appropriate physicians and groups is a challenging step in cost measurement.
As a guideline, some principles are involved in determining a valid approach to be used in assigning patients:
-- The approach must be valid conceptually. It must be defensible, understandable and accepted by providers, health plans, and other users of the measurement results;
-- The approach must be supported by readily available information, including the outputs from an episode grouping;
-- The approach should be robust across applications – working well for different sources of health plan data, patient populations and over time;
-- The approach should be flexible and consider the characteristics of the specialists being compared and the nature and severity of their patients and episodes;
-- Population-based approaches should be supported. A population, or panel-based approach is sometimes used when measuring performance for primary care physicians (PCPs), in particular where providers are performing a gatekeeper function for a population of members. In this case, responsibility for a member's care may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member during the time period.
-- "Sufficient" evidence of the provider's responsibility for the patient should exist.

As a guideline, the following approach can be used for attribution.
Physician Attribution using a Primary Care, Population-based Approach. As noted above, a "population" or "panel" based approach is sometimes used when measuring performance for peer groups comprised of primary care physicians. In particular, this approach is often considered where the PCPs are performing a gatekeeper function for a population of

members. In this case, responsibility for a member's qualified patients may be attributed to the member's PCP — whether or not the PCP provided any of the services for that member.

This approach involves:
-- Identification of a PCP for each member. This identification can often be obtained from the member's eligibility record which can include a notation of their assigned PCP for a period of time. Alternatively, a PCP can be "imputed" for a member based on that primary care specialist providing the greatest number of services or service costs for selected primary care services. When imputing, the list of eligible providers is typically limited to those physicians involved in primary care. Using either approach, a member is linked to a PCP for a defined period of time.

Physician Attribution – Other Issues. Some general issues around episode attribution remain. The first involves tie-breakers. For example, if two physicians own the same number of patient visits with a member within a period of time, the physician with the greatest amount of primary care core services costs could be selected.
A second issue involves setting appropriate thresholds to determine sufficient activity. As noted above, most activity-based attribution approaches involve some screening of the winning provider to ensure that they owned sufficient activity relative to their peers and to other providers during the course of the time period.

S11.2.Identify and define peer group
Identify the peer group and detail how peer group is identified and provide rationale for this methodology

Guidelines : Peer groups define the group of physicians being compared. For example, a common practice in physician measurement is to assess the actual costs for those patients attributed to an individual physician or practice and compare actual costs to peer results, risk adjusted to support more valid comparisons. The peer values use in these comparisons will be influenced by the selection of providers included in the peer group.

In defining a peer group for cost of care measurement, most organizations will include physicians from the same specialty or area of expertise. For organizations with a network covering broad geographic area, some distinction by provider geography can also be used. Internal medicine, cardiology, or general surgery within a certain geographic area are examples of a peer group. Although not directly related to defining a group of providers as peers, many organizations provide separate measurements by line of business, separating results and peer comparisons by commercial, Medicare and Medicaid products.

S11.3. Level of Analysis:

Clinician : Group/Practice
Clinician : Individual
Clinician : Team
Facility
Health Plan
Integrated Delivery System
Population : County or City
Population : National
Population : Regional

S11.4.Detail measure outliers or thresholds
Detail any threshold or outlier rules and decisions based on measure resource use and provide rationale for this methodology

Guidelines : Outlier episodes – as a guideline, high outlier cost patients should be included, but all costs truncated at the high outlier cost threshold used for the patient (a technique called "winsorization"). Where costs by type of service are used in measurement, individual service costs can be pro-rated to reflect the truncated total cost for a high cost outlier patient.

S11.5.Detail sample size requirements
Detail the sample size requirement including rules associated with the type of measure

Guidelines : The choice of sample size is less important using techniques that include statistical methods that

find only statistically significant difference. If your choice of sample size is low, you will not find many cases that are statistically significantly different. A sample size of 30 is chosen because this is when the normal distribution is a good approximation of the student's t distribution. However, the choice of sample size is less critical when using tests of statistical significance.

S11.6.Define benchmarking or comparative estimates
Detail steps to produce benchmarking and comparative estimates and provide rationale for this methodology

Guidelines : The response to section S10.1 includes examples on how to compare the results for a physician with that of their peers or with external best practice benchmarks. As a guideline, in making comparative estimates, the following considerations should be made:
-- As described in S10.1, comparative results should be risk adjusted to support more valid comparisons;
-- Differences in fee schedules and contracts – for some comparisons using cost of care, differences between actual practice and the benchmark can be influenced by different unit pricing assumptions. In these cases standard pricing or general adjustments to cost levels can be made; and
-- Practice styles and service utilization can differ between geographic areas and also between physicians in different specialties. Although comparisons across areas and specialties can provide insights, proper care should be taken in interpreting and communicating results.

S12.Type of Score:

Continuous variable
Count
Rate/Proportion
Ratio

If available, please provide a sample report:

S12_sample_score_report_POP.pdf

S12.1. Interpretation of Score.
(Classifies interpretation of score (s) according to whether higher or lower resource use amounts is associated with a higher or lower score, a score falling within a defined interval, or a passing score, etc)

For the continuous cost measures (also a rate), an increase in costs can be interpreted as an increase in the resources used to diagnose, manage and treat the patients in question. This score provides a representation of the weighted utilization expended, where the weights are based on the cost assigned to each individual service.

For the counts of utilization measures per 1,000 (also a rate), an increase in utilization can be interpreted as an increase in the resources used to diagnose, manage and treat the patients in question. This score provides a representation of un-weighted utilization. Counts of utilization measures are most useful when the services being aggregated are similar (e.g., inpatient admits, E&M visits, MRI services).

The risk adjusted observed to expected cost or utilization ratio (O/E ratio) includes three important steps:
-- Compute the observed experience for the provider being measured, across all patients to be included in the comparison;
-- Compute the experience for peers or a best practice benchmark. Compute this experience at the level of the risk adjustment, in this case ERG Risk Level. For a peers benchmark, average cost PMPM or use per 1,000 across all peers for the ERG Risk Level can be computed;
-- Compare the observed experience with the risk adjusted peers or benchmark experience – often called the "expected" result. This expected result is adjusted to reflect both the peers/benchmark levels of performance and also the provider's own case mix of patients by condition and level of severity. The ratio of observed to expected results can be termed the relative cost ratio and is a risk adjusted measure.

The O/E ratio (relative resource use ratio) can be interpreted based on its magnitude and relationship to a peer average or

other guidelines. A relative cost ratio less than 1.00 indicates that the observed resource use per episode for a provider is less than his peers. A relative cost ratio greater than 1.00 indicates that the observed resource use for a provider is greater than his risk adjusted peers.

S12.2. Detail Score Estimation
Detail steps to estimate measure score.

The measures described in this submission include continuous cost measures, counts of utilization, rates and proportions (per episode), and the ratio of observed to expected results, based on risk adjusted comparisons. The continuous cost measures, counts of utilization, and rates per episode are described in detail in S9.5. The details involved in computing the O/E ratio measure is provided in S10.1.

S12.3. Describe discriminating results approach
Detail methods for discriminating differences (reporting with descriptive statistics--e.g., distribution, confidence intervals)

In all of these measures we end up with an O/E ratio for a provider. In order to determine the statistical accuracy of this measure we start by measuring the variance of this metric:
Var(O/E)
The Variance of this metric has been estimated by the following expression in a number of journal articles[1]:
Var(O/E)=(Sum(Var(Oi))/[Sum(Ei)]2
Where Var(Oi) is the variance for each of the physician's episodes across all episodes in it's statistical unit for the peer group.
Then the standard error (SE) for this measurement is Sqrt(Var(O/E).
Finally, a 95% confidence interval could be calculated by:
(O/E-1.96*SE, O/E+1.96*SE)
Alternatively, a 90% confidence interval could be calculated by: (O/E-1.64*SE, O/E+1.64*SE)

[1] Adams et al. BMC Health Services Research 2010, 10:57 http://www.biomedcentral.com/1472-6963/10/57

TESTING/ANALYSIS	
Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. See guidance on measure testing.	**Eval Rating**
TESTING ATTACHMENT (5MB or less) or URL: *If needed, attach supplemental documentation (Save file as: SA_Reliability_Validity Testing) All fields of the submission form that are supplemented within the attachment must include a summary of important information included in the attachment and its intended purpose, including any references to page numbers, tables, text, etc.* URL: Please supply the username and password: Attachment: SA_Reliability_Validity Testing_POP.xls	
SA1. Reliability Testing *For each module tested or for the overall measure score:* **SA1.1. Data/sample** *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)* Different samples of data are used in testing ETG, ERG and the Resource Use Measures described in this submission.	**2a2** **H☐** **M☐**

The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-- 4 million member sample used for validity and reliability of the ETG/ERG methodology and the software used for ETG/ERG processing;
-- 250,000 member sample, with manipulated data for content validation testing of the post-ETG/ERG processing associated with Resource Utilization measures (measures described in S9.5);
-- 7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA1.2. Analytic Methods
(Describe method of reliability testing and rationale)

Reliability refers to the consistency of a measure. A measure is considered reliable when the same result is produced repeatedly. Reliability of ETG/ERG and Resource Utilization Measures are judged based upon an internal consistency reliability approach. The first level of internal consistency reliability focuses on high-level parallel processing tests and regressions performed by internal Quality Assurance (QA) teams. This level focuses on assessment of results compared to a baseline set of expected results developed based upon the experience of the benchmark described above in SA1.1.

The second level of internal consistency reliability involves detailed parallel processing comparisons between ETG/ERG and Resource Use Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel reliability testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing reliable results using a variety of processing configuration options and data input scenarios.

As an example, the text below provides the Table of Contents for an ETG testing plan for ETG Version 7.0. A similar plan is used for ERG testing. The plan includes processes around data used, test cases created, comparison of software results with those produced by a SAS prototype (to determine matching across parallel implementations of the methodology), and a review by clinical analysts to assess face validity. A similar testing approach is used for the resource use measures that are processed following ETG grouping.
ETG TEST PLAN DOCUMENT – EXAMPLE TABLE OF CONTENTS
SECTION 1—OVERVIEW
1.1 PURPOSE OF TEST PLAN DOCUMENT
1.2 TESTING APPROACH AND DELIVERABLES
1.3 SCOPE OF TESTING
1.4 DATA
1.5 ETG GROUPER
SECTION 2—BENCHMARK TEST CASES
2.1 ACCOUNTING OF GROUPED VS. UNGROUPED RECORDS
2.2 DISTRIBUTION BY ETG
2.3 DISTRIBUTION BY MPC
2.4 DISTRIBUTION BY EPISODE COMPLETENESS
2.5 DISTRIBUTION BY OUTLIERS
2.6 EPISODE AGE/GENDER PROFILE
SECTION 3—FEATURE-RELATED TEST CASES
3.1 COMPARISON OF SOFTWARE TO PROTOTYPE
3.2 SEVERITY ADJUSTMENT
3.3 COMPLICATIONS
3.4 COMORBIDITIES
3.5 TREATMENT INDICATORS
3.6 EPISODE INDICATORS
SECTION 4—REVISION HISTORY

L☐
I☐

Finally, the results are applied to the healthcare data of different organizations to assess both the ability of the organization's data to support the measurements and also the consistency of results across the organizations. This assessment of reliability also provides evidence that the measures are being applied in a consistent and valid way.

SA1.3.Testing Results
(reliability statistics, assessment of adequacy in the context of norms for the test conducted)

The extensive testing of ETG/ERG produces volumes of results across the test cases and other concepts described above. In terms of validity and assessing the reliability of the implementation, testing of the measurement software with the parallel SAS prototype involves iterations until a high degree of matching of results is observed (over 99.9%). The statistic used in this testing is the exact match of the grouping of records and assignment of resource measures. The difference in the result for each measure between the methodology and prototype is calculated and differences equal to zero are considered an exact match.

SA1.4.Finding statement(s)—*(i.e., is the measure deemed reliable, limitations identified)*

As noted in SA1.3, the findings on reliability and validity suggest the measures could be applied in a consistent way, the results matched well to clinical expectations, and the results from the measurement software were consistent with those produced by a parallel process using prototype implementation of the methodologies.

SA2.Validity Testing
For each module tested or for the overall measure score:

SA2.1. Data/Sample
(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)

Different samples of data are used in testing ETG/ERG and the Resource Use Measures described in this submission. The general source of information is the Ingenix National health care services benchmark database. This database describes enrollment, medical and pharmacy services, and providers for a population of more than 25 million covered lives. The data used in the testing described in this submission was primarily for commercial non-elderly individuals and covered the years 2006 thru 2010, depending on the test. The primary test databases used to support the tests described in the SA section are as follows:
-- 4 million member sample used for validity and reliability of the ETG/ERG methodology and the software used for ETG/ERG processing;
-- 250,000 member sample, with manipulated data for content validation testing of the post-ETG/ERG processing associated with Resource Utilization measures (measures described in S9.5);
-- 7 million member sample from 9 health care organizations used for reliability assessment (consistency across data sources). This sample was also used to support the empirical estimates for the Importance section of this submission (IM1)

SA2.2.Analytic Method
(Describe method of validity testing and rationale; if face validity, describe systematic assessment)

Also, please see our responses to SA1 which relate to both reliability and validity.

2b2

Validity determines if the output of the measure is accurate. The measure must be valid in order for the results to be accurately applied and interpreted. Validity of a measure is not determined by a single statistic, but by evaluating the complete result of the measures and demonstrating the relationship between the result and the intended purpose of the measure. Validity of ETG/ERGs and Resource Use Utilization Measures are judged based upon both content validity and face validity.

Content validation testing involves detailed parallel processing comparisons between ETG/ERG and Resource Use Utilization Measure software and SAS-based software prototypes. Software prototypes are developed and maintained by analysts familiar with the detailed methodology of the measures for the purpose of Content Validation (CV). This form of parallel testing requires that the results of both the software and prototype match exactly and are executing the logic in accordance with methodological specifications. Observed differences in the output are researched and resolved

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prior to releasing the software for use. Multiple parallel processing comparisons are performed to assure that the software is producing valid results using a variety of processing configuration options and data input scenarios. The statistic used in this testing is the exact match of the grouping of records and assignment of resource measures. The difference in the result for each measure between the methodology and prototype is calculated and differences equal to zero are considered an exact match. The face validity approach assesses if the measure result is reasonable and functioning according to expectations. This form of validation is most typically performed when modifications to the methodology intentionally change the result of the measure. When this occurs a pre- and post-modification parallel run is created and changes in the measure output are validated for accuracy at face value. **SA2.3.Testing Results** *(statistical results, assessment of adequacy in the context of norms for the test conducted; if face validity, describe results of systematic assessment)* Please see our responses to SA1 which relate to both reliability and validity. **SA2.4. Finding statement(s)—(***i.e., is the measure deemed reliable, limitations identified)* Please see our responses to SA1 which relate to both reliability and validity.	
SA3.Testing for Measure Exclusions **SA3.1. Describe how the impact of exclusions (if specified) is transparent as required in the criteria** In terms of resource use measure construction following ETG/ERG grouping, no additional data inclusion or exclusion are applied. **SA3.2. Data/sample for analysis of exclusions** *(Description of the data or sample including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included)* Not Applicable for ERG and the non-condition specific measures. **SA3.3. Analytic Method** *(Describe type of analysis and rationale for examining exclusions, including exclusion related to patient preference)* Not Applicable for ERG and the non-condition specific measures. **SA3.4. Results** *(statistical results for analysis of exclusions, e.g., frequency, variability, sensitivity analyses)* Not Applicable for ERG and the non-condition specific measures. **SA3.5. Finding statement(s)--** *(i.e., is the measure deemed reliable, limitations identified)* Not Applicable for ERG and the non-condition specific measures. **SA4. Testing Population** *Which populations were included in the testing data? (Check all that apply)* Commercial	**2b3** **H☐** **M☐** **L☐** **I☐**
SA5. Risk adjustment strategy *Refer to items S10.1 and S10.2 to rate this criterion.*	**2b4** **H☐**

	M☐ L☐ I☐
SA6. Data analysis and scoring methods *Refer to items S12-S12.3 to rate this criterion.*	**2b5** H☐ M☐ L☐ I☐
SA7. Multiple data sources *Refer to S7 & all SA1 items to evaluate this criterion.*	**2b6** H☐ M☐ L☐ I☐ NA☐
SA6. Stratification of Disparities (if applicable) *Refer to item S10.2 to rate this criterion.*	**2c** H☐ M☐ L☐ I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Scientific Acceptability of Measure Properties?*	
Steering Committee: Overall, was the criterion, *Scientific Acceptability of Measure Properties*, **met?** **Rationale:**	**Y**☐ **N**☐
USABILITY	
Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.	**Eval Rating**
Meaningful, Understandable, and Useful Information **U1. Current Use:** Internal quality improvement Payment Public reporting (disclosure to performance results to the public at large) Quality improvement with external benchmarking **U1.1. Use in Public Reporting Initiative Use in Public Reporting.** *Disclosure of performance results to the public at large (If used in a public reporting program, provide name of program(s), locations, Web page URL(s). If not publicly reported in a national or community program, state the plans to achieve public reporting, potential reporting programs or commitments, and timeline, e.g., within 3 years of endorsement)* Several users of ETGs, ERGs and Resource Use Measures rely on the analysis to support Public Reporting initiatives. Examples include: -- Health Care Organization #1: Measuring Provider Efficiency -- HCO #1 ranks providers based on efficiency by ETG using a single provider ETG overview. Using COGNOS reporting capabilities the organization is able to drill down into procedure and drug level comparisons. -- Health Care Organization #2: Corporate Wellness Programs	**3a** H☐ M☐ L☐ I☐

-- HCO #2 uses ETG output to analyze utilization patterns and identify potential diseases and populations to target for intervention. ERGs are used to adjust the average and comparison population expenditures and Specialty profiles are created using both ETG and ERG results. ERG scores are used to identify patients who could be potential high utilizers.
-- Health Care Organization #3: Physician Profiling and Clinical Benchmarking
-- HCO #3 has embarked upon an initiative to use ETG information for clinical reporting and benchmarking. ERG output complements the ETG information for underwriting and physician profiling programs as well.
-- Health Care Organization #4: Provider Specialty Profiling and Predictive Modeling
-- HCO #4 utilizes Resource Use Measures and ETG to identify variations in practice patterns, measure performance and examine utilization and disease management. The primary focus is on high cost specialties and ETGs are used to identify the top 5 conditions to support specialty profiles and cost comparisons and drill downs. ERG scores are used to risk adjust PCP profiles to adjust for patient severity.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request.

U1.2. Use in QI
(If used in improvement programs, provide name of program(s), locations, Web page URL(s)).

Examples of ETGs, ERGs and Resource Use Measures in action within health care industry quality improvement initiatives include:
-- Health Care Organization #5: Internal Quality Improvement – Disease Management
-- HCO #5 utilizes 30 months of medical and pharmacy data totaling more than 17 million claim lines to support identification of member risk and stratification of members for care management teams. ETG and ERG groupers are embedded within their claims datamart with other sources of data and support the identification of clinical care gaps and impactable dollars for quality improvement.
-- Health Care Organization #6: Employer Group Utilization Reports to Identify Provider Variance
-- HCO #6 generates Employer or Account Group Utilization Reports which includes a global view of ETGs for the population. These reports are used to identify the top 5 ETGs where variance is the greatest to target specific procedures for a particular ETG in order to improve quality for the Employer group.
-- Health Care Organization #7: Cesarean Section Study
-- HCO #7 conducted a study on Cesarean Section, Infertility and multiple births using ETGs. Providers with high rates of Cesarean Section were identified and compared based upon severity indices. The study determined that multiple births were a significant contributor to a market's cost and procedure variances. The study further identified infertility treatment specialists who need improvement based upon the comparison to their peers of best practices and procedures.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request

U1.3. Use for other Accountability Functions (payment, certification, accreditation)
(If used in a public accountability program, provide name of program(s), locations, Web page URL(s).

Other examples of industry use of ETGs, ERGs and Resource Use Measures include Provider Pay for Excellence programs and Member Cost Analysis Tools. Specific examples include:
-- Health Care Organization #8: Provider Analytics Team
-- HCO #8 leverages the power of ETGs and Resource Use Measures to support their internal Provider Analytics team. This team manages the Provider Profiling program to support the Medical Directors' high-level physician review and network physician meetings as well as bi-annual provider profiling reports. In addition to provider profiling the Provider Analytics team uses ETG and Resource Use Measures to Impute PCP information to identify gaps in care, support physician group award programs and Patient Centered Medical Home projects.
-- Health Care Organization #9: Member Cost Analysis Tools
-- HCO #9 has created a patient website with cost calculation tools to provide detailed treatment costs for the patient based upon ETG analysis. The website includes tips on how to reduce costs as well as a pharmacy co-pay calculator. Users may access median cost reports for an ETG as well as cost ranges for procedures based upon CPT codes, pharmaceuticals and office visits. The website also provides comparison data for providers based upon performance indices.

Please note that Health Care Organization names were not provided to protect the confidentiality of our users. HCO names for reference purposes are available upon request.

U2. Testing of Interpretability *(Provide a rationale for why the measure performance results are meaningful, understandable, and useful to the intended audience(s) for both public reporting and quality improvement).* **U2.1. If understanding or usefulness was demonstrated** *(e.g., through systematic feedback from users, focus group, cognitive testing, analysis of quality improvement initiatives) describe the data, methods, and results.* The assessment of the usability of the results from ETG-based and ERG-based measures of resource use is primarily from two entities: the ETG Medical Advisory Board and the Ingenix User Forums around these measures. The Medical Advisory Board is comprised of medical directors from healthcare organizations that employ episode based measures to assess resource use. Input and feedback from these clinicians inform both the ETG and ERG methodologies themselves and also how they are used in creating and sharing provider measurement results. The Ingenix User Forums include technical experts from organizations that use ETG, ERG and non-condition resource use measures. Similar to the Medical Advisory Board, input and feedback from this group informs these methodologies, but primarily is focused on how results are used to create and share provider measurement results.	**3b** H☐ M☐ L☐ NA☐
U2.2. Resource use data and result can be decomposed for transparency and understanding. *Refer to items S11 -S12.3.*	**3c** H☐ M☐ L☐ I☐
U3. If there are similar or related measures (either same measure focus or target population) measures (both the same measure focus and same target population), list the NQF # and title of all related and/or similar measures. **U3.1. If this measure has EITHER the same measure focus OR the same target population as NQF-endorsed measure(s): Are the measure specifications completely harmonized?** **U3.2. If the measure specifications are not completely harmonized identify the differences, rationale, and impact on interpretability and data collection burden.** *Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)*	**3d** H☐ M☐ L☐ I☐ NA☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Usability*?	
Steering Committee: Overall, to what extent was the criterion, *Usability*, **met?** **Rationale:**	H☐ M☐ L☐
FEASIBILITY	
Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement.	Eval Rating
F1. Data Elements Generated as Byproduct of Care Processes *How are the data elements needed to compute measure scores generated? Data used in the measure are:*	**4a** H☐

Generated by and used by healthcare personnel during the provision of care, e.g., blood pressure, lab value, medical condition Coded by someone other than person obtaining original information (e.g., DRG, ICD-9 codes on claims)	M☐ L☐ I☐
F2. Electronic Sources *Are the data elements needed for the measure as specified available electronically? (Elements that are needed to compute measure scores are in defined, computer-readable fields)* ALL data elements in electronic claims **F2.1. If ALL data elements are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources.**	**4b** H☐ M☐ L☐ I☐
F3. Susceptibility to Inaccuracies, Errors, or Unintended Consequences *Identify susceptibility to inaccuracies, errors, or unintended consequences of the measurement identified during testing and/or operational use and strategies to minimize or prevent. If audited, provide results.* The main source of inaccuracies relate to small sample size. There are lower limits on the number of patients for a given provider or specialty that are allowed for inclusion in the analysis. Sample sizes that are determined to be too small are eliminated from the analysis. These situations will occur infrequently, as the sample sizes that are customarily dealt with are very large. A methodology for applying statistical techniques to determine confidence intervals of the results has been created and can be applied to gauge the accuracy of the analysis. In addition, sample size is less of an issue when multiple episode types are combined for a single metric.	**4c** H☐ M☐ L☐ I☐
F4. Data Collection Strategy *Describe what you have learned/modified as a result of testing regarding barriers to operational use of the measure (e.g., availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, cost of proprietary measures).* The measure is in use beyond internal QI. Please see the section on Usability.	**4d** H☐ M☐ L☐ I☐
TAP/Workgroup: What are the strengths and weaknesses in relation to the subcriteria for *Feasibility*?	
Steering Committee: Overall, to what extent was the criterion, *Feasibility*, met? **Rationale:**	H☐ M☐ L☐
RECOMMENDATION	
Steering Committee: Do you recommend for endorsement? **Comments:**	Y☐ N☐ A☐
CONTACT INFORMATION	
Co.1 **Measure Steward (Intellectual Property Owner)** Co.1 **Organization**	

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Co.2 Point of Contact

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Measure Developer If different from Measure Steward

Co.3 Organization

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Co.5 Submitter If different from Measure Steward POC

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Co.6 Additional organizations that sponsored/participated in measure development

ADDITIONAL INFORMATION

Workgroup/Expert Panel involved in measure development
Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

Measure Developer/Steward Updates and Ongoing Maintenance
Ad.2 Year the measure was first released:

Ad.3 Month and Year of most recent revision:

Ad.4 What is your frequency for review/update of this measure?

Ad.5 When is the next scheduled review/update for this measure?

Ad.6 Copyright statement/disclaimers:

Information submitted is confidential/proprietary to Ingenix, copyright 2011

Ad. 7 Date of Submission (*MM/DD/YY*)**:**

04/18/2011

INGENIX

GENERAL METHODS DOCUMENT
Building Episodes with Episode Treatment Groups (ETG) and Assessing Risk with Episode Risk Groups (ERG)

This document provides an overview of two Ingenix methodologies important to supporting resource use and cost of care measures. The first methodology, Episode Treatment Groups (ETG) groups individual medical and pharmacy services to unique episodes of care defining a condition for a patient. The second methodology, Episode Risk Groups (ERG) measures the relative health risk for an individual based on their mix of episodes of care. ETG is used extensively to support episode-based measurement of cost of care. ERG is employed in supporting population-based cost measurement, including the non-condition specific resources use measures included in this submission. The first section of this document describes ETG, followed by an overview of ERG.

Episode Treatment Groups (ETG) Construction Logic

ETG is an episode grouping methodology that identifies a unique clinical condition for a patient and the services involved in diagnosing, managing and treating that condition. ETG organizes routinely-collected professional, inpatient, outpatient and ancillary services, including pharmaceutical services, into episodes of care. ETG evaluates each claim service record with respect to provider type, procedure and diagnoses codes and other information to assign the record to an appropriate episode. In doing this, all conditions and episodes are considered for a patient, including concurrently occurring conditions.

ETG covers the breadth of clinical medicine. Examples of ETG based conditions include diabetes, asthma and chronic sinusitis. Each episode is further assigned a condition-specific severity level, supporting case-mix adjusted comparisons within and across conditions.

ETG uses as input data information from administrative medical and pharmacy claim service records and encounters describing the individual services provided to a patient. ETG also uses information describing each patient, including age and gender and time enrolled with a health plan or other organization.

The Episode Building Process

The ETG episode building process has four important steps:

1. Assign a Record Type to each service record, including the identification of Anchor Records
2. Build Episodes from Anchor Records
3. Group Ancillary Records to Episodes
4. Finalize the Episodes (determine if complete/incomplete; determine outlier status; assign severity, comorbidities, treatments and complicating factors to the episode)

Step 1: Assign Record Type

In building an episode the first step involves assigning a Record Type to each service record. The Record Type assigned to a record is determined by the Provider Type, Procedure Code and/or Revenue Code Service, and National Drug Code (NDC) (if any), on the record. Provider Type values are based on the mapping of individual provider specialties to one of three values recognized by ETG: Clinician, Facility and Other. The Provider Type values and their definitions are as follows:

Provider Type	Definition
Clinician	Providers who make diagnoses and recommend treatment
Facility	Acute and long term care providers such as short-term hospitals, skilled nursing facilities, and psychiatric or chemical dependency facilities

Other/Non-Clinician	All other healthcare providers

Service records including a NDC code are assigned a Pharmacy Record Type. For other services, ETG assigns one of the following Record Types to the service record using Provider Type and the procedure/revenue code:

Record Type	Record Type Value	Anchor or Non-Anchor
Management	A record submitted by a clinician for services related to the evaluation of a patient's condition.	Anchor
Surgery	A record submitted by a clinician for surgical or related procedures.	Anchor
Ancillary	A record submitted by any provider for laboratory, radiological or similar services.	Non-Anchor
Facility	A record submitted by a treatment facility for **room & board** services.	Anchor
Pharmacy	A record for a prescription drug service.	Non-Anchor

Most management records contain evaluation and management CPT-4 codes. Surgery records are primarily procedural CPT-4 codes. Facility records are room and board revenue codes billed by a facility (also referred to as a confinement). Pharmacy records are claims containing a NDC or certain HCPCS codes related to the administration of a drug. Record Types of management, surgery and facility are considered *anchor* records. The identification of an anchor record is significant because it indicates that a clinician has evaluated a patient, and has decided on the types of services required to further identify and treat the patient's condition. Non-anchor records describe *ancillary* services that aid in evaluating and treating the patient, such as x-rays and laboratory services.

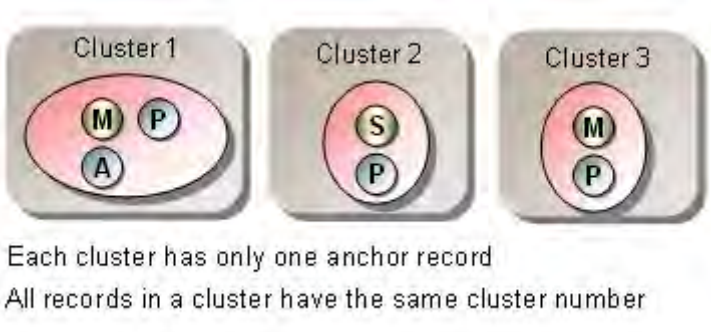
Step 2: Build Episodes from Anchor Records

Only anchor records can start or continue an episode.

Anchor records can do the following:

- Begin a *cluster* that can open a new episode or join an existing episode
- Extend an episode (time-wise) – providing evidence that the episode has not yet completed
- Create one or more or *phantom* clusters – when there are multiple diagnosis codes on the same anchor record
- Determine if episodes incur complications, comorbidities and significant surgery/treatment

Each anchor record forms a cluster. A cluster is the basic unit of an episode. Each cluster is comprised of an anchor record and zero, one, or more ancillary and pharmacy records. Each episode consists of one or more clusters. The illustration below demonstrates this concept, showing management (M), ancillary (A) and pharmacy (P) records within clusters.



The way in which records are grouped to an episode is governed mainly by the diagnosis, revenue, and procedure codes on the service record. Each ICD-9-CM, CPT-4/HCPCS, and revenue code has been mapped to ETG concepts through extensively vetted and continually updated clinical tables. (ICD-9 procedure codes are not used in grouping.)

Diagnosis Codes

The software relies heavily on the diagnosis codes to help identify discrete episodes. The diagnosis identifies the condition being treated, which broadly translates to an ETG. Each diagnosis code is identified with a given diagnosis class. There are three diagnosis classes:

- Specific: These are ICD-9 diagnosis codes that indicate a specific disease. This code represents a disease or condition (as opposed to a sign or symptom) and is specific enough to be linked to a single ETG. ICD-9 Diagnosis code 250.40 (diabetes with renal manifestations) is a specific diagnosis code. It is primary to, and only eligible for, an episode of Diabetes.
- Non-Specific: These ICD-9 diagnosis codes represent a disease or condition (as opposed to a sign or symptom), but may not be specific enough to identify a single ETG. ICD-9 Diagnosis code 389.0 (conductive hearing loss) is a non-specific diagnosis code. It is primary to Hearing Disorders and incidental to several other conditions, such as Chronic Sinusitis.
- Sign and Symptom: These ICD-9 diagnosis codes represent signs and symptoms of disease as opposed to disease or condition. ICD-9 Diagnosis code 338.2 (chronic pain) is a sign & symptom diagnosis code. It is eligible for many ETGs due to its generic nature.

The software runs one member at a time and processes the anchor records with a 365-day moving window. The diagnosis codes are grouped in several distinct passes. This is done so that the grouper processes the more specific codes first, leaving the sign & symptom codes until later, when it is more likely that there is a more specific episode for these claims to join.

Each diagnosis code is matched with one or more ETG through a diagnosis eligibility table. The exception is 'E' codes which are not grouped. Each diagnosis code is further ranked, based on its strength of association with the ETG. The rank values are as follows: low, medium, high and primary. Low, medium, and high represent the strength of the match association. A primary rank describes conditions that define a disease and are the main codes that impact grouping decisions. The grouper first processes the specific and non-specific diagnosis codes so that concrete conditions/diseases are created. It then processes the sign and symptom diagnosis codes in reverse chronological order based on service dates to determine the best episode each of them can group to.

Procedure/Revenue Codes

In building episodes, the procedure or revenue code can help to identify the ETG to which a particular claim record can be assigned. A given procedure may be valid for several ETGs, though not equally so. A procedure eligibility table therefore ranks the valid ETGs for each procedure to give a better sense of how closely related the service is to each ETG. The ranking options are: Very Low, Low, Medium, and High, with High being the strongest rank.

The following table provides an example of a rhinoplasty surgical procedure and selected ETGs it is eligible for and the rank for each ETG.

ETG	Rank
Trauma to ear/nose/throat	High
Other inflammatory conditions of ear/nose/throat	High
Allergic rhinitis	Medium
Chronic sinusitis	Medium
Trauma of oral cavity	Medium
Open fracture or dislocation - head & face	Medium
Congenital & acquired anomalies of ear/nose/throat	Medium
Closed fracture or dislocation - head & face	Low
Cocaine or amphetamine dependence	Very Low
Other disorders of ear/nose/throat	Very Low

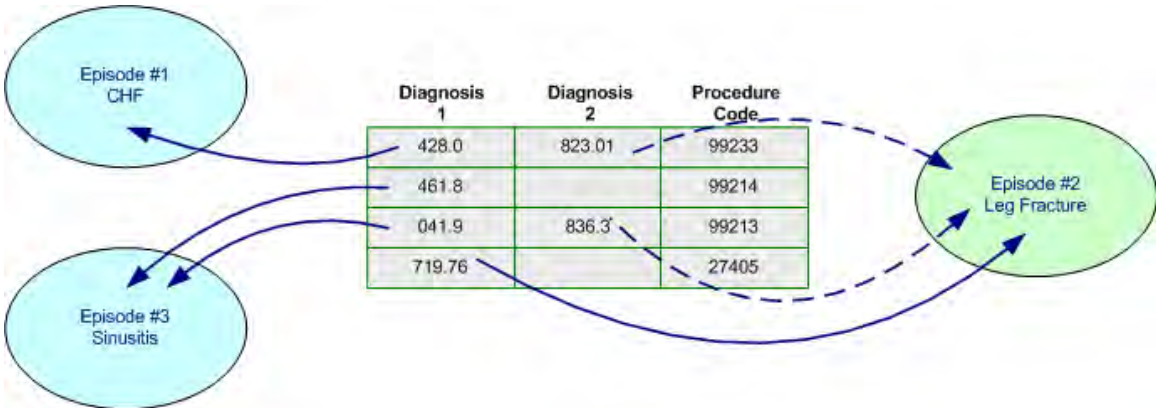
For a record to be eligible to start or join an episode, the diagnosis code and the procedure/revenue code must both be eligible for an ETG. Where an anchor record can be assigned to more than one observed

episode for a patent, the record is assigned to an episode according to the best combination of the procedure/revenue code and the diagnosis code.

- The ETG Online Clinical Knowledge Base application on the Ingenix website (www.ingenix.com/transparency) provides more information about the diagnosis and procedure associations to an ETG.

Clusters: Real and Phantom

Once the anchor record has been assigned to an episode using a diagnosis, the remaining diagnosis codes on the record, if any, are examined. If a remaining diagnosis would more appropriately belong to a different episode than the episode the anchor record is assigned to, the software starts a phantom cluster for a new episode. At this point, phantom clusters are episodes created that will not have any costs assigned to them. Subsequent service records for a patient will now have available additional episodes for potential grouping, so the software will be able to assign these subsequent services more accurately than it would without using phantoms. This allows the diagnostic information to be utilized fully to identify and track all of the conditions for which the member is being treated, yet still assign records to only one episode. The diagram below provides an illustration. The dotted line indicates a phantom episode was started, a straight line indicates a real episode was started. In the case of diagnosis code 719.76, it joined episode #2 which originated as a phantom episode, thereby converting it to a real episode.

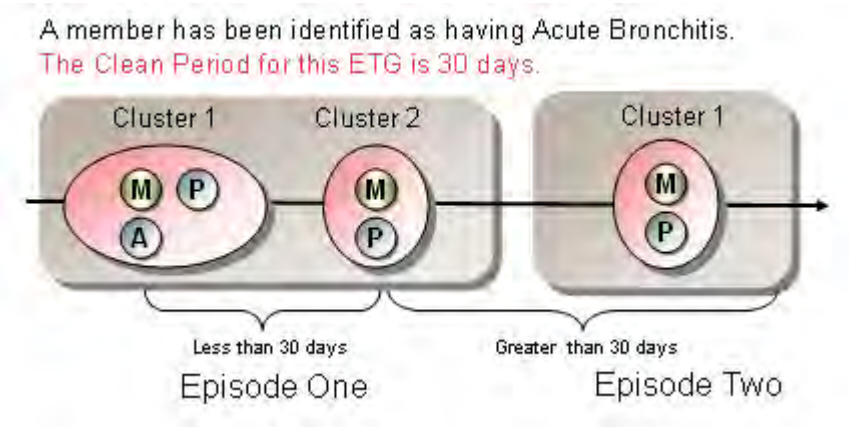


Time Windows: Clean Periods and Member Eligibility

Along with the clinical aspects of starting and grouping records to an episode, the method of episode completion is a crucial feature of ETG. The approach taken for the identification of a complete episode relies on a flexible, rather than a fixed length of time. There are no standard definitions of an episode's chronological length. The episode grouper continues to identify and track all clinical activity for an episode for as long as a condition is actively treated – a concept described as discrete dynamic clean periods. A clean period is defined as the absence of treatment for a specified period of time. Each ETG has its own unique clean period. For an acute condition the concept of a clean period is of most importance. For example, the clean period for Acute Bronchitis is 30 days. Once an episode has started for this ETG, anchor records clinically consistent for acute bronchitis group to this episode until such time as 30 days passes without any corresponding clinically consistent treatment. For Chronic Bronchitis, the clean period is 180 days, consistent with a more chronic illness. In some obvious instances, e.g. benign hypertension or diabetes, there is no clean period. The condition is basically life-long (chronic) and all clinically consistent treatments group to an episode of benign hypertension for as long as data are available.

The clean period window is dynamic in that each new anchor record that joins an episode moves the clean period window by extending the episode's dates. In this way, as long as a condition is consistently treated such that the date of each successive anchor record is less than or equal to the clean period date for the ETG, the episode can last forever.

The following diagram provides an illustration of this concept for an acute condition.



In this example, two episodes of **Acute Bronchitis** are created.

- Three office visits occurred for the treatment of acute bronchitis (record type M)
- The time frame between the second office visit and the third office visit was greater than 30 days, the clean period of this ETG. Therefore, a second episode was created for this condition

If the example above had been for a chronic condition, such as benign hypertension, all services would be grouped into a single episode since chronic conditions do not necessarily have an end to their clean period. To allow for analysis on chronic conditions, we offer 5 options for users to parse the episode into annual increments:

1. User chooses any month to begin year long episodes
2. Year long episodes will start from the beginning of the grouped data
3. Year long episodes will start from the member's eligible start date
4. Year long episodes will end at the end of the grouped data
5. Year long episodes will end at the member's eligible end date

Step 3: Group Ancillary Records

Non-anchor records represent services that are incidental to the direct evaluation, management and treatment of a patient. There are two types of non-anchor records: pharmacy records and ancillary records (such as laboratory tests, x-rays, and the facility component of ambulatory surgery centers services). Each non-anchor record links to only one cluster and eventually becomes part of the episode that the cluster is finally grouped to.

Ancillary records can do the following:

- Join an episode
- Convert a phantom episode into a real episode

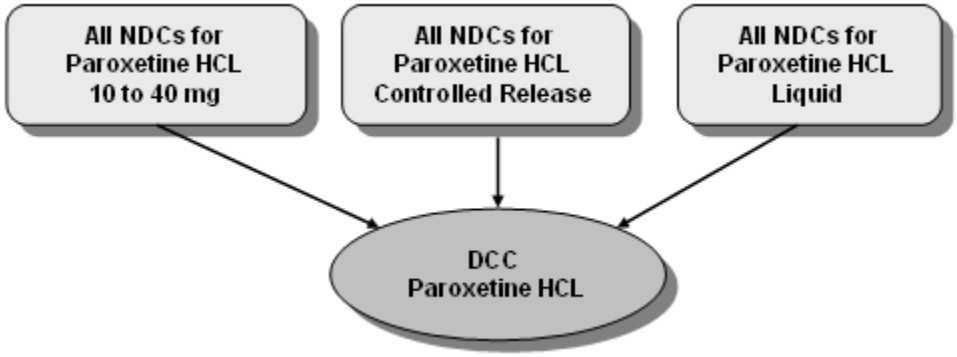
When the grouper assigns an ancillary record to an episode, it uses the ancillary record's diagnosis and procedure/revenue codes. It first evaluates diagnosis codes classified as *specific and nonspecific* to determine if these records can join an episode and then evaluates diagnosis codes classified as *sign and symptoms*. The ancillary record must occur within the clean period time window around an existing episode in order to be eligible to group to an existing episode. An ancillary record cannot extend an episode's length it can only join an episode.

It is possible for an ancillary claim record to be medically inappropriate for any episode or condition for a member. If an ancillary record is not eligible to join an open episode it is then evaluated to determine if it can be assigned to a preventive ETG (screening and immunizations). If an ancillary record cannot be assigned to a valid ETG or a preventive ETG, it is identified as an orphan record.

For drug records, the methodology evaluates each pharmacy record against the episodes for which the patient is being treated. The NDC code assigned to the pharmacy record provides the clinical information to support this evaluation. Just as with the procedure and diagnosis codes, a drug eligibility table identifies ETGs to which an NDC can be associated and the strength of that association (low, medium, high), allowing the grouper to assign the drug claim record to the most clinically appropriate episode. HCPCS Level II procedure codes which represent a drug and its administration (e.g., injectables) are also considered to be pharmacy records, and are grouped in the same way. Due to the large number of NDCs defined for pharmacy services, the ETG methodology uses a drug

classification hierarchy to support grouping. Each drug is associated with a Drug Classification Code (DCC) which represents a drug, or a specific dosage form of a drug. For example, the NDCs for all strengths of the antidepressant Paroxetine maps to the DCC of Paroxetine. The DCC concept assigned to the pharmacy services then supports grouping, not the NDC.

The following diagram illustrates this drug hierarchy.



Like ancillary records, drug records cannot extend an episode's length; they can only join an episode. A drug record must occur within an episode's clean period (pre and post) in order to be eligible to group to it.

Step 4: Finalize the Episode

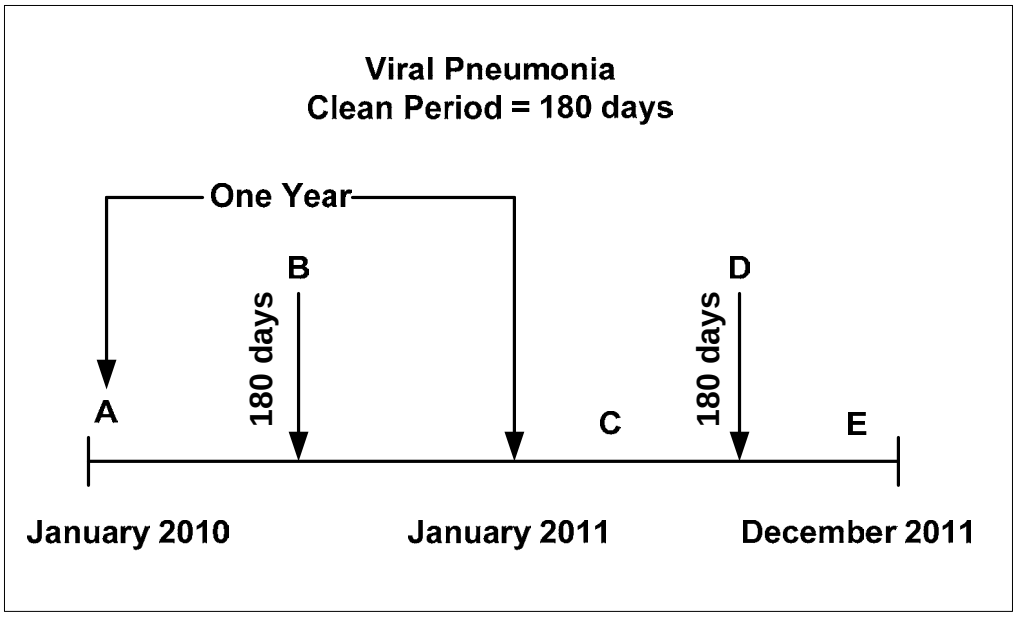
After all claim records have grouped to an episode, the grouper then has all of the information it needs to finalize the episode.

Episode Completeness

The notion of a complete episode is complex in the reality of service data. For example, assume the grouping start date is January 1, 2010. Does an episode for an acute condition with its first anchor record on January 3, 2010 begin with this claim or is the episode in progress? The episode of the acute condition might have begun sometime earlier (prior to January 1, 2010) but the data to identify the exact begin date are not available. The opposite is also true. With data available from January 1, 2009 through December 31, 2010, can it be known if a record incurred on December 21st for an existing episode is the end of the episode? The answer to both questions is that under certain circumstances it cannot be known whether a claim service record is actually the true beginning or the true end of an episode. A distinction must be made between episodes which are to be considered complete from those whose completeness cannot be determined.

A clean start is defined as a situation where the true beginning date for an episode is known. The ETG methodology identifies a clean start by comparing the incurred date of the first anchor record of an episode with the beginning date of the overall service data range used in the grouping (or a member's beginning eligibility date, if later), with the episode's ETG clean period. If that anchor record date starts after the number of pre-episode clean period days, the episode is considered to have a clean start. If it occurs within the clean period days, it is considered to have an unknown start. The same methodology is true for a clean finish. A clean finish uses the same number of clean period days to determine a known finish. If the last anchor record occurs prior to the clean period days, the episode is determined to have a clean finish. If the last anchor record occurs within the clean period days, it has an unknown finish.

The following diagram illustrates this concept. In this example, anchor records for this episode occur at dates A, B, C, D and E. Note that treatment for this episode spans well over one year.



Assume that the time frame from each anchor record to the next is less than 180 days.

• The anchor record at date A is an unknown start.

• The anchor records at dates B and C (if either were the first anchor records in this episode) represent a clean start.

• The anchor records at dates D and E (if either were the last anchor records in this episode) represent an unknown finish.

The Episode Type identifies the completeness of an episode. Each acute episode is assessed for its status as a full year episode, and if it has a clean start and/or a clean finish. The episode's start and end dates are compared against the clean period days. From this information, the Episode Type can be determined.

The following table identifies the episode type values and whether they are considered complete or incomplete.

Episode Type	Description	Completeness Status
0	Clean start, clean finish	Complete
1	Clean start, unknown finish (full year)	Complete
2	Unknown start, clean finish (full year)	Complete
3	Unknown start, unknown finish (full year)	Complete
4	Clean start, unknown finish	Incomplete
5	Unknown start, clean finish	Incomplete
6	Unknown start, unknown finish	Incomplete
7	Incomplete annual episode	Incomplete

To account for chronic conditions, the ETG methodology utilizes different logic than the clean/unknown starts and finishes approach described above. ETG does this since chronic conditions are life-long going forward. Further, to support proper episode-to-episode comparisons, the grouper limits the length of each episode for a chronic condition to one year. Such episodes which extend beyond one year and are subsequently limited to one year for analytical purposes are referred to as chronic annual episodes. As mentioned above, the grouper provides different configurable options on how to decide the starting point for chronic episodes: start month (a static month), grouping start date, grouping end date, eligibility start date and eligibility end date.

The grouper uses that selection and looks forward or back 365 days, collects all anchor records within that timeframe and assigns them to an episode. It does this in segments of 365 days. It then collects the non-anchor records and assigns them to the appropriate annual episode. To determine, within an annual year, if a chronic annual episode is considered complete, the grouper determines the member's enrollment during that time span: if the member is eligible for the entire year, that episode is considered complete (episode type 0); if not, the episode is considered incomplete (episode type 7).

The start date and end date for chronic annual episodes is based on the configurable selection made and is a full year date span. It does not reflect the date of the first and last anchor records within the episode, as acute episodes do.

Assign Complications/Condition Status, Comorbidities and Treatments to Episodes

The ETG methodology also identifies complication, comorbidity and treatment factors observed for each episode. After core grouping, episodes are evaluated to determine if they have any complicating factors, if there are any comorbidities

associated with the episode's condition, and if the activity within the episode contains any treatment indicators. This information is reflected in the ETG number, allowing one to see specific characteristics of each episode. The first 6 digits are the base class, a unique number identifying the ETG; the 7th, 8th and 9th digits are the flags for with or without complication, with or without comorbidity and with or without treatments. The following table provides an illustration of the ETG numbers for Diabetes.

Base ETG	ETG Number	ETG Long Description
163000	163000000	Diabetes, w/o complication, w/o comorbidity, w/o surgery
163000	163000001	Diabetes, w/o complication, w/o comorbidity, with surgery
163000	163000010	Diabetes, w/o complication, with comorbidity, w/o surgery
163000	163000011	Diabetes, w/o complication, with comorbidity, with surgery
163000	163000100	Diabetes, with complication, w/o comorbidity, w/o surgery
163000	163000101	Diabetes, with complication, w/o comorbidity, with surgery
163000	163000110	Diabetes, with complication, with comorbidity, w/o surgery
163000	163000111	Diabetes, with complication, with comorbidity, with surgery

Identifying the condition status/complications for an episode provides specificity of the episode's clinical condition, any complications associated with the episode, and the disease progression, when applicable. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as condition status codes. For example, condition statuses for Diabetes include Diabetes Type 1 and Diabetes Type 2. Examples of condition statuses that specify complications of diabetes are Diabetic Coma and Diabetic Ketoacidosis.

Condition status codes are identified by diagnosis codes on anchor records, are ETG-specific and must occur within an episode in order for the episode to be designated as *with complication*. For example, the diagnosis of diabetic coma would not be a condition status code for an episode of chronic bronchitis. It would, however, be a condition status code for an episode of diabetes. In addition to flagging the ETG as *with complication*, the grouper provides an optional output that lists each condition status that was identified within an episode.

A comorbidity is defined as the presence of more than one disease or health condition in a member at a given time. The ETG methodology categorizes some diagnosis codes into groupings of similar diagnoses, referred to as comorbidity codes. For example, the comorbidity *Chronic bronchitis* is a compilation of the various diagnosis codes designated as such (e.g. Bronchiectasis, Chronic bronchitis NOS, etc.). The grouper identifies comorbidities by evaluating diagnosis codes on the records designated as anchor records. It keeps track of all of a member's comorbidities, gives each comorbidity an active period (approximately two years) and uses that information to determine what episodes can be labeled as *with comorbidity*.

Comorbidities are ETG-specific. For example, the comorbidity of Chronic Bronchitis would not be a comorbidity for an episode of Lymphoma. It would, however, be a comorbidity for an episode of Congestive Heart Failure. Any comorbidity that has an active period that occurs during an eligible episode's time frame is considered a comorbidity for that episode.

Treatment indicators are categorizations of services such as defining surgeries and active management procedures for malignant neoplasms (chemotherapy and radiation therapy services). These categories are a grouping of similar procedures. For example, the treatment indicator for Chemotherapy is a compilation of the procedure codes and revenue codes that are classified as chemotherapy services.

When flagging the ETG as *with or without surgery*, the ETG methodology provides more specificity for certain conditions. For malignant neoplasms, the grouper will also designate if an episode incurred active management services. For cardiology conditions, the grouper will also designate if an episode incurred these specific defining surgeries: angioplasty, CABG and valve surgery. The exact nature of the treatment will be specified by the value of the treatment indicator digit. The procedure and/or revenue codes categorized as a treatment indicator must occur within an episode in order for the episode to be flagged as such.

Given the ETG numbering scheme, where the first six digits define the base condition and the remaining digits describe treatment and other clinical factors, users of the ETG outputs have flexibility in how the grouped results are applied. For example, if the desire is to measure at the condition level, episodes are combined for analysis using the first six digits of the ETG number (the first six digits identify the base ETG). If the combination of

condition and the presence (or not) of a significant surgery are desired to support comparisons, users would combine episodes using the first six digits and the ninth digit of the ETG number. As described below, severity levels can also be used in addition to support comparisons.

Severity Adjusting Episodes

Condition status factors, co-morbidities and patient demographics are used in determining the severity of an ETG episode. The ETG methodology takes advantage of the relevant condition status and co-morbidity factors when determining an episode's severity. In general, these factors indicate a higher risk patient who may require more extensive treatment for a condition. The result is a severity score and severity level for each episode. The higher the severity score, the more resources are expected relative to other condition episodes.

The condition status and co-morbidity factors found to have an impact on the required resources for condition episodes are included in the severity model. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and co-morbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

A separate set of weights is computed for each ETG condition (e.g., Diabetes). There are separate age/gender weights for elderly (age 65 and older) and non-elderly weights.

After condition statuses and comorbidities have been assigned to an episode, the ETG methodology can determine the severity score and severity level for each episode. Each contributing factor to an episode is given a weight: a demographic weight (age & gender), condition status and comorbidities weight, additional weights if there are interactions between multiple complications and interactions between multiple comorbidities (interaction weight), and weights for multiple complications and/or multiple comorbidities (multiple count weights). These weights are then summarized to generate an overall severity score for the episode.

Based on the severity score, the severity level indicates a ranking of where the specific episode is relative to the population of all episodes within that base ETG. There are four potential severity levels, where the value 1 indicates a less severe episode and the value 4 indicates the most severe episode. Not all ETGs are severity adjusted and not all ETGs have 4 severity levels. All episodes for ETGs that are not severity adjusted have a severity score of 1.00 and a severity level of 1.

Episode Risk Groups (ERG) Construction Logic

ERGs describe the relative health risk for a member in terms of current or future health care expenditures. ERG uses the episodes of care created by ETG as building blocks, including what condition episodes are observed and their severity. The nature and mix of episodes provide a clinical profile for a member that can serve as a marker of their current and future need for medical care. The ERG grouper produces two clinically-based risk scores: a retrospective risk score and a prospective risk score. Retrospective risk assessment uses risk markers for a member for a base year to produce a measure of risk for the same year. Prospective risk assessment uses risk markers for a base year to measure risk for a future year.

A high-level overview of the ERG logic is as follows:

1. Translate ETGs into ERGs
2. Generate ERG Profile (a member's demographic characteristics and observed mix of ERG)
3. Calculate ERG Risk Score

Step 1: Translate ETGs into ERGs

The results from an ETG grouping of 12 months of medical and pharmacy services provide the inputs for ERGs. In particular, service records that have been grouped into ETGs for a single year are used as the condition identifiers for the member. The ETG base class and the Severity Level assigned to each claim record are elements used to associate an ETG to an ERG. Base ETG and Severity Level play an important role in assigning ERGs to an individual. As a rule, ERGs are not differentiated using a treatment indicator. However, the active management status of malignant neoplasm ETGs (triggered by the presence of radiation therapy or chemotherapy) is the exception. ERG assignment is not dependent on episode completion status or outlier status. ERG assignment does not vary with the number of episodes or ETGs observed for a member within the same ERG. Members with single or multiple episodes within an ERG receive identical assignments.

The following table provides an example of how the ETG values for Diabetes are translated into an ERG. The Base ETGs (163000 for Diabetes and 901300 for Diabetes Rx Agents, e.g., insulin) describe the observed condition. The Severity Level denotes the level of episode severity, with greater severity indicating a higher level of expected resources required. The different combinations of ETG and severity level trigger an ERG marker. Note that hierarchies are applied to ensure that only one ERG marker from a related clinical family is triggered. The hierarchy below is 0202 (for Diabetes), with a Priority value for each Base ETG and Severity Level. The lower value indicates a higher ranked Priority. Only the Base ETG and Severity Level combination with the lowest value for Priority is retained if more than one combination in the Hierarchy is observed.

Base ETG	Severity Level	ERG	Hierarchy	Priority	ERG Description
163000	1	02.021	0202	03	Diabetes, w/o significant complication/comorbidity
163000	2	02.022	0202	02	Diabetes, with significant complication/comorbidity, I
163000	3	02.022	0202	02	Diabetes, with significant complication/comorbidity, I
163000	4	02.023	0202	01	Diabetes, with significant complication/comorbidity, II
901300	0	02.021	0202	97	Diabetes, w/o significant complication/comorbidity

In summary, an individual's ETG episodes and their severity determine their ERGs. Hierarchies are employed to ensure only the most significant episode in the hierarchy is used to trigger an ERG. With the exception of malignant neoplasm ETGs, medical treatments observed within the episode are not used in determining an individual's ERGs.

The attachment "S5_Code_Table_POP" and tab "ERG-ETG List" include the entire mapping and hierarchies used to translate ETGs into ERGs.

Step 2: Generate ERG Profile

A member's age, gender and mix of ERGs are used to create their ERG profile. Every member is assigned to an age-sex group, using ten age groups: 0-5, 6-11, 12-18, 19-34, 35-44, 45-54, 55-64, 65-74, 75-84 and greater than

84. Members without claims will have no episodes and no ERGs. For these members, risk is based solely on age and gender. Members with claims are assigned to one or more ERGs depending on their mix of episodes of care.

ERG Timing

The ERG models were developed using up to 12 months of data to measure relative health risk for the same 12 month prediction period (retrospective risk) or a future 12 month prediction period (prospective risk).

ERG uses ETG assignments for medical and pharmacy services in the latest 12 month period of the ETG grouping. This 12 month period is called the experience period—the period of time during which markers of member health risk are collected and used to measure retrospective and prospective risk. If more than 12 months of claims are grouped, ERG only uses the most recent 12 months of data.

Step 3: Calculate ERG Risk

Calculating risk involves the assignment of a weight to each ERG and demographic marker of risk. These weights describe the contribution to risk of being in a specific age-sex group or having a particular medical condition included in an ERG. The model of risk can be defined generally as:

$$RiskP_i = \sum a_s * AGESEX_{i,s} + \sum b_e * ERG_{i,e}$$

$$RiskR_i = \sum c_e * ERG_{i,e}$$

where $RiskP_i$ and $RiskR_i$ are the ERG prospective and retrospective risk scores for person i; $AGESEX_{i,s}$ and $ERG_{i,e}$ indicate their age-sex group (s); and ERG assignments (e), and the a's, b's and c's are the risk weights. The age-sex and ERG markers are set to 1 if the marker is observed for an individual, 0 if not. Each member has their own profile of age-sex and ERGs. However, for each ERG model, the risk weights are pre-defined and are the same for all individuals. A person's risk score is the sum of these risk weights for each marker observed.

The ERG development data were obtained from the Ingenix Impact National Database, which includes information from over 40 health plans in nine different geographic census regions. The risk weights for Episode Risk Groups (and the pure age-gender model) were created using multiple linear regression and recent enrollment and medical and pharmacy claims data. The risk weights represent the relative costs per member per month (PMPM) associated with being in a specific age-gender group or having a particular medical condition included in an ERG.

Input Data/Model Outcome

The weights associated with the ERG risk markers vary depending on both the availability of data for use as input and the services to be included in predicted risk. A population which has been grouped with pharmacy data included will likely produce a somewhat different portrait of risk than the same population without pharmacy data. To obtain the most precise measures of risk, ERG offers 2 model options (medical or medical and pharmacy) depending on whether pharmacy claims are available for a given member. The ERG risk markers included in these model options are identical, however the ERG risk weights differ according to which model option is selected.
In most applications of ERG, the risk associated with the cost of all health care services, including both medical and pharmacy services is desired. However, in some applications predicting risk for only medical services may be important. To support this flexibility, ERG also offers options related to the risk outcome: medical and pharmacy services, or medical services only.

Expenditure Thresholds

Expenditure threshold describes the level at which a higher-cost member's annual expenditures might be truncated for an application (truncation refers to capping a member's annual costs at some level prior to analysis). ERG offers three options for annual member threshold levels: $25,000, $100,000, and $250,000. As with the other model options described above, the ERG risk markers included in threshold options are identical, however the ERG risk weights differ. In particular, the risk weights for the three options were derived using different threshold assumptions for the members included in the database used for developing the models. The selection of the expenditure threshold to use in the assessment of relative resource use depends on the application. As a default, most applications of resource use measurement for the submitted measures employ the $100,000 threshold model.

Length of Enrollment

A member's length of enrollment may affect the number and mix of episodes of care observed. This will ultimately affect the ERG risk markers assigned and risk scores generated by the ERG models. Partial enrollment reflects the number of days a member was enrolled during the experience period and a risk weight assignment for the ERG array is based on that length of time. All ERG models utilize partial enrollment to determine the weights used in computing risk.

With this approach, ERG will apply 1 of 4 separate sets of risk weights that correspond with the member's length of enrollment during the 12-month experience period. The enrollment periods are categorized as follows:

Enrollment Period	Days
1-3 months	1-91
4-6 months	92-183
7-9 months	184-274
10-12 months	275-365/366

Risk will also be impacted by whether the member is an elderly or non-elderly individual, due to the different implications of a disease or comorbidity on the overall level of risk for these members. Empirical testing during ERG development supported this premise. As a result, separate sets of ERG weights are used for individuals under 65 than for those aged 65 or greater. Although different weights are used, the same set of risk markers are employed for elderly and non-elderly individuals.

The input data, model outcome, and expenditure threshold data elements are supplied in the member demographics data as input into ERG. The length of enrollment is determined during ERG processing, using the supplied member eligibility dates.

ERG Risk Models and Features

ERG provides significant flexibility for supporting a variety of business applications. The table below identifies each risk model and describes the model's timing, threshold levels, Input/Output options and business uses. As a guideline, the retrospective ERG risk model, $100,000 threshold, is used to support the risk adjustment for the submitted measures. The “Medical/Medical-RX” model weightings are applied for individuals without a pharmacy benefit or without general pharmacy data availability. The “Medical-RX/Medical-RX” model weightings are applied for individuals with a pharmacy benefit/with general pharmacy data availability.

ERG Risk Model	Timing	Thresholds	Input/Output	Business Applications
Prospective Risk Model	12-0-12	25,000 100,000 250,000	Medical/Medical -RX Medical-RX/ Medical-RX	Predicting risk that begins immediately after the claims experience period. Setting payment rates and for risk stratification to support care intervention and disease management.
Retrospective	12	25,000 100,000 250,000	Medical/Medical -RX Medical-RX/Medical-RX	Producing risk for the claims experience period. Comparisons of provider and health plan performance such as physician profiling.

The following table shows a simplistic example of how ERG risk scores are computed for a single member.

ETG	ETG Severity Level	ERG	ERG Description	Retrospective Risk Weight	Prospective Risk Weight
438800 (Asthma)	1	10.041	Asthma, chronic obstructive pulmonary disease, I	0.1537	0.1967
473100 (Infection of stomach & esophagus)	2	01.011	Lower cost infectious diseases	0.0574	0.0372
			Females, 12 to 18	N/A	0.1569
Total Risk Score				**0.4078**	**0.3908**

This example describes a female, age 14, observed to have two unique episodes of care, covering two ETGs: asthma and infection of stomach & esophagus. These ETGs map to two unique ERGs. The member's age, gender and ERGs describe the profile of risk. The sum of the weights assigned to these risk markers provides the overall risk scores.

NQF Resource Use Measure submission

For question S5- Data Dictionary/Code Tables

The content contained in this document is proprietary and confidential

Measure Non-Condition Specific (Population)

This table describes the relationships between ETGs and the associated ERG weights. Please also refer the general overview of ETG and ERG referenced in S2. Note that Treatment values are used for malignant neoplasm episodes to determine an ERG assignment. The values of 0 and 1 (w/o surgery and w/surgery) are categorized as "without active management" while the values of 2 and 3 (chemotherapy and radiation therapy) are categorized as "with active management". With active management episodes are used to indicate a more advanced stage of cancer and are mapped to a higher risk-weighted ERG.

As an example of how the ETG values are translated into an ERG. The Base ETGs for Diabetes (163000 for Diabetes and 901300 for Diabetes Rx Agents, e.g., insulin) describe the observed condition. The Severity Level denote the level of episode severity, with greater severity indicating a higher level of expected resources required (ETG defines 4 levels of severity for Diabetes). The different combinations of ETG and severity level trigger an ERG marker. Note that hierarchies are applied to ensure that only one ERG marker from a related clinical family is triggered. One of these hierarchies is 0202 (for Diabetes) and is defined by assigning a Priority value for each Base ETG and Severity Level in the hierarchy. A lower value indicates a higher ranked Priority. Only the Base ETG and Severity Level combination with the lowest value for Priority is retained if more than one episode with a combination in the Hierarchy is observed.

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
130100		1	01.041	0101	03	AIDS	AIDS/HIV, I
130100		2	01.043	0101	01	AIDS	AIDS/HIV, with significant complication/comorbidity
130100		3	01.043	0101	01	AIDS	AIDS/HIV, with significant complication/comorbidity
130200		1	01.042	0101	04	HIV sero-positive w/o AIDS	AIDS/HIV, II
130400		1	01.033	0102	02	Septicemia	Non-HIV major infectious diseases, III
130400		2	01.036	0102	01	Septicemia	Non-HIV major infectious diseases, with significant complication/comorbidity
130400		3	01.036	0102	01	Septicemia	Non-HIV major infectious diseases, with significant complication/comorbidity
130600		1	01.011	0101	10	Other infectious diseases	Lower cost infectious diseases
130600		2	01.011	0101	10	Other infectious diseases	Lower cost infectious diseases
130600		3	01.021	0101	09	Other infectious diseases	Other moderate cost infectious diseases
130600		4	01.032	0101	06	Other infectious diseases	Non-HIV major infectious diseases, II
130800		1	01.031	0101	08	Immunodeficiencies	Non-HIV major infectious diseases, I
130800		2	01.031	0101	06	Immunodeficiencies	Non-HIV major infectious diseases, I
130800		3	01.035	0101	05	Immunodeficiencies	Non-HIV major infectious diseases, V
139900		1	01.011	all		Infectious diseases signs & symptoms	Lower cost infectious diseases
162000		1	02.051	0209	01	Lipidoses (Gauchers Disease, Fabry Disease, Mucolipidosis I-III)	Other higher cost endocrinology, I
162100		1	02.011	0201	03	Hyper-functioning thyroid gland	Lower cost endocrinology, I
162200		1	02.011	0201	03	Hypo-functioning thyroid gland	Lower cost endocrinology, I
162300		1	02.011	ign		Non-toxic goiter	Lower cost endocrinology, I
162400	0	1	02.041	0201	02	Malignant neoplasm of thyroid gland	Other moderate cost endocrinology
162400	1	1	02.041	0201	02	Malignant neoplasm of thyroid gland	Other moderate cost endocrinology
162400	2	1	02.071	0201	01	Malignant neoplasm of thyroid gland	Malignant neoplasm, thyroid & parathyroid, with active mgmt
162400	3	1	02.071	0201	01	Malignant neoplasm of thyroid gland	Malignant neoplasm, thyroid & parathyroid, with active mgmt
162500		1	02.011	0201	03	Non-malignant neoplasm of thyroid gland	Lower cost endocrinology, I
162600		1	02.011	0201	03	Other diseases of thyroid gland	Lower cost endocrinology, I
163000		1	02.021	0202	03	Diabetes	Diabetes, w/o significant complication/comorbidity
163000		2	02.022	0202	02	Diabetes	Diabetes, with significant complication/comorbidity, I
163000		3	02.022	0202	02	Diabetes	Diabetes, with significant complication/comorbidity, I
163000		4	02.023	0202	01	Diabetes	Diabetes, with significant complication/comorbidity, II
901300		0	02.021	0202	97	Ongoing Rx Tx wo Prov intervention - Diabetes mellitus treatment	Diabetes, w/o significant complication/comorbidity
163100	0	1	02.053	0203	02	Malignant neoplasm of pancreatic gland	Other higher cost endocrinology, III
163100	1	1	02.053	0203	02	Malignant neoplasm of pancreatic gland	Other higher cost endocrinology, III
163100	2	1	02.061	0203	01	Malignant neoplasm of pancreatic gland	Malignant neoplasm, pancreas/pituitary/adrenal, with active mgmt
163100	3	1	02.061	0203	01	Malignant neoplasm of pancreatic gland	Malignant neoplasm, pancreas/pituitary/adrenal, with active mgmt
163200		1	02.011	0203	04	Non-malignant neoplasm of pancreas	Lower cost endocrinology, I
163300	0	1	02.051	0204	02	Malignant neoplasm of pituitary gland	Other higher cost endocrinology, I
163300	1	1	02.051	0204	02	Malignant neoplasm of pituitary gland	Other higher cost endocrinology, I
163300	2	1	02.061	0204	01	Malignant neoplasm of pituitary gland	Malignant neoplasm, pancreas/pituitary/adrenal, with active mgmt
163300	3	1	02.061	0204	01	Malignant neoplasm of pituitary gland	Malignant neoplasm, pancreas/pituitary/adrenal, with active mgmt
163400		1	02.041	0204	05	Non-malignant neoplasm of pituitary gland	Other moderate cost endocrinology
163400		2	02.052	0204	04	Non-malignant neoplasm of pituitary gland	Other higher cost endocrinology, II
163400		3	02.053	0204	03	Non-malignant neoplasm of pituitary gland	Other higher cost endocrinology, III
163500		1	02.041	0205	03	Hyper-functioning adrenal gland	Other moderate cost endocrinology
163600		1	02.012	0205	04	Hypo-functioning adrenal gland	Lower cost endocrinology, II
163700	0	1	02.051	0205	02	Malignant neoplasm of adrenal gland	Other higher cost endocrinology, I
163700	1	1	02.051	0205	02	Malignant neoplasm of adrenal gland	Other higher cost endocrinology, I
163700	2	1	02.061	0205	01	Malignant neoplasm of adrenal gland	Malignant neoplasm, pancreas/pituitary/adrenal, with active mgmt
163700	3	1	02.061	0205	01	Malignant neoplasm of adrenal gland	Malignant neoplasm, pancreas/pituitary/adrenal, with active mgmt
163800		1	02.041	0205	03	Non-malignant neoplasm of adrenal gland	Other moderate cost endocrinology

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
163900		1	02.041	0206	03	Hyper-functioning parathyroid gland	Other moderate cost endocrinology
164000		1	02.041	0206	03	Hypo-functioning parathyroid gland	Other moderate cost endocrinology
164100	0	1	02.051	0206	02	Malignant neoplasm of parathyroid gland	Other higher cost endocrinology, I
164100	1	1	02.051	0206	02	Malignant neoplasm of parathyroid gland	Other higher cost endocrinology, I
164100	2	1	02.071	0206	01	Malignant neoplasm of parathyroid gland	Malignant neoplasm, thyroid & parathyroid, with active mgmt
164100	3	1	02.071	0206	01	Malignant neoplasm of parathyroid gland	Malignant neoplasm, thyroid & parathyroid, with active mgmt
164200		1	02.011	0206	04	Non-malignant neoplasm of parathyroid gland	Lower cost endocrinology, I
164300		1	02.011	0210	02	Female sex gland disorders	Lower cost endocrinology, I
164300		2	02.041	0210	01	Female sex gland disorders	Other moderate cost endocrinology
164400		1	02.011	0215	02	Male sex gland disorders	Lower cost endocrinology, I
164500		1	02.041	0211	02	Nutritional deficiency	Other moderate cost endocrinology
164500		2	02.052	0211	01	Nutritional deficiency	Other higher cost endocrinology, II
164600		1	02.011	ign		Gout	Lower cost endocrinology, I
164700		1	02.031	0209	02	Hyperlipidemia, other	Hyperlipidemia, excluding lipidoses
164800		1	02.011	0212	02	Obesity	Lower cost endocrinology, I
164800		2	02.041	0212	01	Obesity	Other moderate cost endocrinology
164900		1	02.011	0213	02	Dehydration	Lower cost endocrinology, I
164900		2	02.041	0213	01	Dehydration	Other moderate cost endocrinology
165100		1	02.011	0214	03	Other metabolic disorders	Lower cost endocrinology, I
165100		2	02.041	0214	02	Other metabolic disorders	Other moderate cost endocrinology
165100		3	02.052	0214	01	Other metabolic disorders	Other higher cost endocrinology, II
165200		1	02.053	ign		Cystic fibrosis	Other higher cost endocrinology, III
165300		1	02.041	ign		Other diseases of endocrine glands	Other moderate cost endocrinology
169900		1	02.011	all		Endocrine disease signs & symptoms	Lower cost endocrinology, I
206800		1	03.011	0302	02	Agranulocytosis	Lower cost hematology
206800		2	03.051	0302	01	Agranulocytosis	Other higher cost hematology
206800		3	03.051	0302	01	Agranulocytosis	Other higher cost hematology
206900		1	03.011	0303	03	Thrombocytopenia	Lower cost hematology
206900		2	03.022	0303	01	Thrombocytopenia	Other moderate cost hematology, II
206900		3	03.023	0303	02	Thrombocytopenia	Other moderate cost hematology, III
207000		1	03.041	ign		Hemophilia	Hemophilia
207200	0	1	03.031	0301	04	Leukemia	Neoplastic blood diseases & leukemia, I
207200	0	2	03.032	0301	03	Leukemia	Neoplastic blood diseases & leukemia, II
207200	0	3	03.032	0301	03	Leukemia	Neoplastic blood diseases & leukemia, II
207200	0	4	03.032	0301	03	Leukemia	Neoplastic blood diseases & leukemia, II
207200	1	1	03.031	0301	04	Leukemia	Neoplastic blood diseases & leukemia, I
207200	1	2	03.032	0301	03	Leukemia	Neoplastic blood diseases & leukemia, II
207200	1	3	03.032	0301	03	Leukemia	Neoplastic blood diseases & leukemia, II
207200	1	4	03.032	0301	03	Leukemia	Neoplastic blood diseases & leukemia, II
207200	2	1	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	2	2	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	2	3	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	2	4	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	3	1	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	3	2	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	3	3	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207200	3	4	03.034	0301	01	Leukemia	Neoplastic blood diseases & leukemia, IV
207300	0	1	03.031	0301	04	Other malignancies of blood & lymphatic systems	Neoplastic blood diseases & leukemia, I
207300	1	1	03.031	0301	04	Other malignancies of blood & lymphatic systems	Neoplastic blood diseases & leukemia, I
207300	2	1	03.034	0301	01	Other malignancies of blood & lymphatic systems	Neoplastic blood diseases & leukemia, IV
207300	3	1	03.034	0301	01	Other malignancies of blood & lymphatic systems	Neoplastic blood diseases & leukemia, IV
207400		1	03.061	ign		Sickle-cell anemia	Sickle-cell anemia
207600		1	03.023	0304	02	Myelodysplastic syndromes	Other moderate cost hematology, III
207600		2	03.051	0304	01	Myelodysplastic syndromes	Other higher cost hematology
207800	0	1	03.031	0301	04	Lymphoma	Neoplastic blood diseases & leukemia, I
207800	1	1	03.031	0301	04	Lymphoma	Neoplastic blood diseases & leukemia, I
207800	2	1	03.033	0301	02	Lymphoma	Neoplastic blood diseases & leukemia, III
207800	3	1	03.033	0301	02	Lymphoma	Neoplastic blood diseases & leukemia, III
207900	0	1	03.032	0301	03	Multiple myeloma	Neoplastic blood diseases & leukemia, II
207900	1	1	03.032	0301	03	Multiple myeloma	Neoplastic blood diseases & leukemia, II
207900	2	1	03.034	0301	01	Multiple myeloma	Neoplastic blood diseases & leukemia, IV
207900	3	1	03.034	0301	01	Multiple myeloma	Neoplastic blood diseases & leukemia, IV
208000		1	03.021	0305	02	Anemia of chronic diseases	Other moderate cost hematology, I
208000		2	03.022	0305	01	Anemia of chronic diseases	Other moderate cost hematology, II

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
208200		1	03.011	0306	02	Iron deficiency anemia	Lower cost hematology
208200		2	03.021	0306	01	Iron deficiency anemia	Other moderate cost hematology, I
208200		3	03.021	0306	01	Iron deficiency anemia	Other moderate cost hematology, I
208900		1	03.011	0306	02	Other hematologic diseases	Lower cost hematology
209900		1	03.011	all		Hematology signs & symptoms	Lower cost hematology
238800		1	04.031	0401	06	Mood disorder, depressed	Mood disorder, depressed, w/o significant complication/comorbidity
238800		2	04.033	0401	04	Mood disorder, depressed	Mood disorder, depressed, with significant complication/comorbidity
238800		3	04.033	0401	04	Mood disorder, depressed	Mood disorder, depressed, with significant complication/comorbidity
238900		1	04.032	0401	05	Mood disorder, bipolar	Mood disorder, bipolar, w/o significant complication/comorbidity
238900		2	04.034	0401	03	Mood disorder, bipolar	Mood disorder, bipolar, with significant complication/comorbidity
238900		3	04.034	0401	03	Mood disorder, bipolar	Mood disorder, bipolar, with significant complication/comorbidity
239000		1	04.021	ign		Dementia	Other moderate cost psychiatry
239100		1	04.021	ign		Organic drug or metabolic disorders	Other moderate cost psychiatry
239200		1	04.042	ign		Autism & child psychoses	Child psychiatric disorders, II
239300		1	04.051	0401	02	Psychotic & schizophrenic disorders	Psychotic & schizophrenic disorders, w/o significant complication/comorbidity
239300		2	04.051	0401	02	Psychotic & schizophrenic disorders	Psychotic & schizophrenic disorders, w/o significant complication/comorbidity
239300		3	04.052	0401	01	Psychotic & schizophrenic disorders	Psychotic & schizophrenic disorders, with significant complication/comorbidity
239400		1	04.012	ign		Personality disorder	Lower cost psychiatry, II
239700		1	04.021	ign		Eating disorder	Other moderate cost psychiatry
239800		1	04.012	0401	08	Anxiety disorder or phobias	Lower cost psychiatry, II
239800		2	04.012	0401	08	Anxiety disorder or phobias	Lower cost psychiatry, II
239800		3	04.012	0401	08	Anxiety disorder or phobias	Lower cost psychiatry, II
240000		1	04.011	ign		Psychosexual disorder	Lower cost psychiatry, I
240100		1	04.041	ign		Attention deficit disorder	Child psychiatric disorders, I
240200		1	04.042	ign		Development disorder	Child psychiatric disorders, II
240300		1	04.012	ign		Somatoform disorder	Lower cost psychiatry, II
240400		1	04.021	ign		Mental retardation	Other moderate cost psychiatry
240400		2	04.021	ign		Mental retardation	Other moderate cost psychiatry
240600		1	04.012	0401	08	Other neuropsychological or behavioral disorders	Lower cost psychiatry, II
249900		1	04.011	all		Psychiatric diseases signs & symptoms	Lower cost psychiatry, I
271100		1	05.011	ign		Cocaine or amphetamine dependence	Lower cost substance abuse
271200		1	05.011	ign		Acute alcohol intoxication	Lower cost substance abuse
271400		1	05.021	ign		Alcohol dependence	Other moderate & higher cost substance abuse
271500		1	05.021	ign		Opioid or barbiturate dependence	Other moderate & higher cost substance abuse
271600		1	05.011	all		Other drug dependence	Lower cost substance abuse
314000		1	06.011	ign		Viral meningitis	Lower cost neurology
314100		1	06.041	ign		Bacterial & fungal meningitis	Other higher cost neurology, I
314200		1	06.031	ign		Viral encephalitis	Other moderate cost neurology, I
314300		1	06.041	ign		Nonviral encephalitis	Other higher cost neurology, I
314400		1	06.041	ign		Parasitic encephalitis	Other higher cost neurology, I
314500		1	06.011	ign		Toxic encephalitis	Lower cost neurology
314700		1	06.041	0604	01	Brain abscess	Other higher cost neurology, I
314800		1	06.041	0604	01	Spinal abscess	Other higher cost neurology, I
315000		1	06.032	ign		Inflammation of central nervous system, other	Other moderate cost neurology, II
315100		1	06.062	0601	02	Multiple sclerosis	Multiple sclerosis & ALS, II
315200		1	06.051	0608	02	Epilepsy	Epilepsy, I
315200		2	06.052	0608	01	Epilepsy	Epilepsy, II
315300	0	1	06.072	0602	01	Malignant central nervous system metastases	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315300	1	1	06.072	0602	01	Malignant central nervous system metastases	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315300	2	1	06.072	0602	01	Malignant central nervous system metastases	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315300	3	1	06.072	0602	01	Malignant central nervous system metastases	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315400	0	1	06.071	0602	02	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, w/o metastases, with active mgmt
315400	0	2	06.071	0602	02	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, w/o metastases, with active mgmt
315400	0	3	06.071	0602	02	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, w/o metastases, with active mgmt
315400	1	1	06.071	0602	02	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, w/o metastases, with active mgmt
315400	1	2	06.071	0602	02	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, w/o metastases, with active mgmt
315400	1	3	06.071	0602	02	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, w/o metastases, with active mgmt
315400	2	1	06.072	0602	01	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315400	2	2	06.072	0602	01	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315400	2	3	06.072	0602	01	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315400	3	1	06.072	0602	01	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315400	3	2	06.072	0602	01	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315400	3	3	06.072	0602	01	Malignant neoplasm of central nervous system	Malignant neoplasm, central nervous system, with metastases, with active mgmt
315600		1	06.032	0602	03	Non-malignant neoplasm of central nervous system	Other moderate cost neurology, II

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
316000		1	06.031	0603	04	Cerebral vascular disease	Other moderate cost neurology, I
316000		2	06.032	0603	03	Cerebral vascular disease	Other moderate cost neurology, II
316000		3	06.042	0603	02	Cerebral vascular disease	Other higher cost neurology, II
316000		4	06.041	0603	01	Cerebral vascular disease	Other higher cost neurology, I
316300		1	06.011	0604	04	Brain trauma	Lower cost neurology
316300		2	06.031	0604	03	Brain trauma	Other moderate cost neurology, I
316400		1	06.032	0601	05	Alzheimer's disease	Other moderate cost neurology, II
316500		1	06.011	0604	04	Spinal trauma	Lower cost neurology
316500		2	06.032	0604	02	Spinal trauma	Other moderate cost neurology, II
316500		3	06.032	0604	02	Spinal trauma	Other moderate cost neurology, II
316600		1	06.062	0601	02	Amyotrophic lateral sclerosis	Multiple sclerosis & ALS, II
316700		1	06.031	0601	06	Hereditary & degenerative diseases of central nervous system, other	Other moderate cost neurology, I
316700		2	06.041	0601	03	Hereditary & degenerative diseases of central nervous system, other	Other higher cost neurology, I
316700		3	06.041	0601	03	Hereditary & degenerative diseases of central nervous system, other	Other higher cost neurology, I
316700		4	06.042	0601	01	Hereditary & degenerative diseases of central nervous system, other	Other higher cost neurology, II
316800		1	06.041	0601	03	Parkinson's disease	Other higher cost neurology, I
316900		1	06.021	0605	02	Migraine headache	Migraine headache, w/o significant complication/comorbidity
316900		2	06.021	0605	02	Migraine headache	Migraine headache, w/o significant complication/comorbidity
316900		3	06.022	0605	01	Migraine headache	Migraine headache, with significant complication/comorbidity
317100		1	06.031	0606	03	Congenital disorders of central nervous system	Other moderate cost neurology, I
317100		2	06.041	0606	02	Congenital disorders of central nervous system	Other higher cost neurology, I
317100		3	06.042	0606	01	Congenital disorders of central nervous system	Other higher cost neurology, II
317300		1	06.031	ign		Inflammation of cranial nerves	Other moderate cost neurology, I
317500		1	06.031	0607	02	Carpal tunnel syndrome	Other moderate cost neurology, I
317700		1	06.031	0607	02	Inflammation of non-cranial nerves, except carpal tunnel	Other moderate cost neurology, I
317700		2	06.041	0607	01	Inflammation of non-cranial nerves, except carpal tunnel	Other higher cost neurology, I
317900		1	06.031	ign		Peripheral nerve neoplasm	Other moderate cost neurology, I
318100		1	06.031	ign		Traumatic disorders of cranial nerves	Other moderate cost neurology, I
318300		1	06.031	ign		Traumatic disorders of non-cranial nerves	Other moderate cost neurology, I
318400		1	06.032	ign		Congenital disorders of peripheral nerves	Other moderate cost neurology, II
318600		1	06.032	ign		Other neurological diseases	Other moderate cost neurology, II
319900		1	06.011	all		Neurological diseases signs & symptoms	Lower cost neurology
350100		1	07.021	ign		Internal eye infection	Other moderate cost ophthalmology
350300		1	07.011	ign		External eye infection, except conjunctivitis	Lower cost ophthalmology
350400		1	07.011	ign		Conjunctivitis	Lower cost ophthalmology
350600		1	07.011	ign		Inflammatory eye disease	Lower cost ophthalmology
350800	0	1	07.061	0701	01	Malignant neoplasm of eye, internal	Malignant neoplasm, eye
350800	1	1	07.061	0701	01	Malignant neoplasm of eye, internal	Malignant neoplasm, eye
350800	2	1	07.061	0701	01	Malignant neoplasm of eye, internal	Malignant neoplasm, eye
350800	3	1	07.061	0701	01	Malignant neoplasm of eye, internal	Malignant neoplasm, eye
350900	0	1	07.061	0701	01	Malignant neoplasm of eye, external	Malignant neoplasm, eye
350900	1	1	07.061	0701	01	Malignant neoplasm of eye, external	Malignant neoplasm, eye
351000		1	07.011	0701	02	Non-malignant neoplasm of eye, internal	Lower cost ophthalmology
351100		1	07.011	0701	02	Non-malignant neoplasm of eye, external	Lower cost ophthalmology
351500		1	07.031	ign		Glaucoma	Glaucoma
351500		2	07.031	ign		Glaucoma	Glaucoma
351700		1	07.041	ign		Cataract	Cataract
351900		1	07.011	ign		Trauma of eye	Lower cost ophthalmology
352100		1	07.011	ign		Congenital anomaly of eye	Lower cost ophthalmology
352400		1	07.051	0704	01	Diabetic retinopathy	Diabetic retinopathy
352600		1	07.021	0704	02	Non-diabetic vascular retinopathy	Other moderate cost ophthalmology
352800		1	07.011	0704	03	Other vascular disorders of eye except retinopathies	Lower cost ophthalmology
353000		1	07.021	ign		Macular degeneration	Other moderate cost ophthalmology
353200		1	07.011	ign		Non-macular degeneration	Lower cost ophthalmology
353600		1	07.011	ign		Visual disturbances	Lower cost ophthalmology
353600		2	07.011	ign		Visual disturbances	Lower cost ophthalmology
353700		1	07.011	all		Other & unspecified diseases & disorders of eye & adnexa	Lower cost ophthalmology
385000		1	08.061	0801	01	Heart or heart/lung transplant	Heart and/or lung transplant
386500		1	08.041	0801	16	Ischemic heart disease	Ischemic heart disease, heart failure, cardiomyopathy, I
386500		2	08.042	0801	14	Ischemic heart disease	Ischemic heart disease, heart failure, cardiomyopathy, II
386500		3	08.044	0801	09	Ischemic heart disease	Ischemic heart disease, heart failure, cardiomyopathy, IV
386500		4	08.044	0801	04	Ischemic heart disease	Ischemic heart disease, heart failure, cardiomyopathy, IV
386600		1	08.071	ign		Pulmonary heart disease	Pulmonary heart disease
386800		1	08.043	0801	11	Congestive heart failure	Ischemic heart disease, heart failure, cardiomyopathy, III

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
386800		2	08.045	0801	07	Congestive heart failure	Ischemic heart disease, heart failure, cardiomyopathy, V
386800		3	08.046	0801	06	Congestive heart failure	Ischemic heart disease, heart failure, cardiomyopathy, VI
386800		4	08.046	0801	02	Congestive heart failure	Ischemic heart disease, heart failure, cardiomyopathy, VI
386900		1	08.042	0801	12	Cardiomyopathy	Ischemic heart disease, heart failure, cardiomyopathy, II
386900		2	08.043	0801	08	Cardiomyopathy	Ischemic heart disease, heart failure, cardiomyopathy, III
386900		3	08.045	0801	03	Cardiomyopathy	Ischemic heart disease, heart failure, cardiomyopathy, V
387000		1	08.021	0812	02	Aortic aneurysm	Other moderate cost cardiology, I
387000		2	08.031	0812	01	Aortic aneurysm	Other higher cost cardiology, I
387100		1	08.042	0801	10	Heart failure, diastolic	Ischemic heart disease, heart failure, cardiomyopathy, II
387100		2	08.046	0801	05	Heart failure, diastolic	Ischemic heart disease, heart failure, cardiomyopathy, VI
387200		1	08.021	0811	02	Cardiac infection	Other moderate cost cardiology, I
387200		2	08.031	0811	01	Cardiac infection	Other higher cost cardiology, I
387200		3	08.031	0811	01	Cardiac infection	Other higher cost cardiology, I
387400		1	08.012	0803	02	Valvular disorder	Lower cost cardiology, II
387400		2	08.012	0803	02	Valvular disorder	Lower cost cardiology, II
387400		3	08.021	0803	01	Valvular disorder	Other moderate cost cardiology, I
387400		4	08.021	0803	01	Valvular disorder	Other moderate cost cardiology, I
387500		1	08.021	ign		Severe ventricular rhythms	Other moderate cost cardiology, I
387600		1	08.021	ign		Severe heart block	Other moderate cost cardiology, I
387700		1	08.011	0804	02	Other conduction disorders	Lower cost cardiology, I
387700		2	08.021	0804	01	Other conduction disorders	Other moderate cost cardiology, I
387700		3	08.021	0804	01	Other conduction disorders	Other moderate cost cardiology, I
387800		1	08.021	0810	02	Atrial fibrillation & flutter	Other moderate cost cardiology, I
387800		2	08.021	0810	02	Atrial fibrillation & flutter	Other moderate cost cardiology, I
387800		3	08.022	0810	01	Atrial fibrillation & flutter	Other moderate cost cardiology, II
388100		1	08.051	0801	18	Hypertension	Hypertension, w/o complication/comorbidity
388100		2	08.051	0801	17	Hypertension	Hypertension, w/o complication/comorbidity
388100		3	08.052	0801	15	Hypertension	Hypertension, with complication/comorbidity
388100		4	08.053	0801	13	Hypertension	Hypertension, with significant complication/comorbidity
388300		1	08.021	0805	02	Cardiac congenital disorder	Other moderate cost cardiology, I
388300		2	08.021	0805	02	Cardiac congenital disorder	Other moderate cost cardiology, I
388300		3	08.032	0805	01	Cardiac congenital disorder	Other higher cost cardiology, II
388600		1	08.021	ign		Cardiac trauma	Other moderate cost cardiology, I
388700		1	08.021	ign		Other cardiac diseases	Other moderate cost cardiology, I
389000		1	08.021	0806	02	Arterial inflammation	Other moderate cost cardiology, I
389000		2	08.021	0806	02	Arterial inflammation	Other moderate cost cardiology, I
389000		3	08.031	0806	01	Arterial inflammation	Other higher cost cardiology, I
389200		1	08.022	ign		Arterial embolism/thrombosis	Other moderate cost cardiology, II
389500		1	08.021	0807	03	Non-cerebral, non-coronary atherosclerosis	Other moderate cost cardiology, I
389500		2	08.022	0807	02	Non-cerebral, non-coronary atherosclerosis	Other moderate cost cardiology, II
389500		3	08.032	0807	01	Non-cerebral, non-coronary atherosclerosis	Other higher cost cardiology, II
389700		1	08.022	ign		Arterial aneurysm, except aorta	Other moderate cost cardiology, II
389800		1	08.012	0808	02	Other non-inflammatory arterial diseases	Lower cost cardiology, II
389800		2	08.022	0808	01	Other non-inflammatory arterial diseases	Other moderate cost cardiology, II
390100		1	08.022	ign		Arterial trauma	Other moderate cost cardiology, II
390300		1	08.022	0809	02	Embolism & thrombosis of veins	Other moderate cost cardiology, II
390300		2	08.031	0809	01	Embolism & thrombosis of veins	Other higher cost cardiology, I
390400		1	08.021	ign		Disorders of lymphatic channels	Other moderate cost cardiology, I
390500		1	08.021	ign		Phlebitis & thrombophlebitis of veins	Other moderate cost cardiology, I
390600		1	08.012	ign		Varicose veins of lower extremity	Lower cost cardiology, II
390700		1	08.011	ign		Other minor inflammatory diseases of veins	Lower cost cardiology, I
390900		1	08.011	ign		Venous trauma	Lower cost cardiology, I
391000		1	08.021	ign		Other diseases of veins	Other moderate cost cardiology, I
399900		1	08.011	all		Cardiovascular diseases signs & symptoms	Lower cost cardiology, I
402000		1	09.012	ign		Infections of oral cavity	Lower cost ear/nose/throat, II
402200		1	09.012	ign		Inflammation of oral cavity	Lower cost ear/nose/throat, II
402400		1	09.012	ign		Trauma of oral cavity	Lower cost ear/nose/throat, II
402600		1	09.011	ign		Other diseases of oral cavity	Lower cost ear/nose/throat, I
402900		1	09.011	0904	02	Otitis media	Lower cost ear/nose/throat, I
402900		2	09.011	0904	02	Otitis media	Lower cost ear/nose/throat, I
402900		3	09.012	0904	01	Otitis media	Lower cost ear/nose/throat, II
403100		1	09.011	ign		Tonsillitis, adenoiditis or pharyngitis	Lower cost ear/nose/throat, I
403200		1	09.011	0903	03	Allergic rhinitis	Lower cost ear/nose/throat, I
403300		1	09.011	0903	03	Acute sinusitis	Lower cost ear/nose/throat, I

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
403500		1	09.012	0903	02	Chronic sinusitis	Lower cost ear/nose/throat, II
403500		2	09.021	0903	01	Chronic sinusitis	Other moderate cost ear/nose/throat
403500		3	09.021	0903	01	Chronic sinusitis	Other moderate cost ear/nose/throat
403700		1	09.011	0905	02	Other infections of ear/nose/throat	Lower cost ear/nose/throat, I
404100		1	09.011	0902	02	Other inflammatory conditions of ear/nose/throat	Lower cost ear/nose/throat, I
404100		2	09.021	0902	01	Other inflammatory conditions of ear/nose/throat	Other moderate cost ear/nose/throat
404300	0	1	09.031	0901	02	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, I
404300	0	2	09.031	0901	02	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, I
404300	1	1	09.031	0901	02	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, I
404300	1	2	09.031	0901	02	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, I
404300	2	1	09.032	0901	01	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, II
404300	2	2	09.032	0901	01	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, II
404300	3	1	09.032	0901	01	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, II
404300	3	2	09.032	0901	01	Malignant neoplasm of ear/nose/throat	Malignant neoplasm, ear/nose/throat, II
404500		1	09.021	0901	03	Non-malignant neoplasm of ear/nose/throat	Other moderate cost ear/nose/throat
404700		1	09.021	ign		Congenital & acquired anomalies of ear/nose/throat	Other moderate cost ear/nose/throat
404900		1	09.011	ign		Hearing disorders	Lower cost ear/nose/throat, I
405100		1	09.012	ign		Trauma to ear/nose/throat	Lower cost ear/nose/throat, II
405300		1	09.021	0905	01	Other disorders of ear/nose/throat	Other moderate cost ear/nose/throat
409900		1	09.011	all		Otolaryngology diseases signs & symptoms	Lower cost ear/nose/throat, I
437000		1	08.061	0801	01	Lung transplant	Heart and/or lung transplant
437200		1	10.011	1001	03	Viral pneumonia	Lower cost pulmonology, I
437200		2	10.012	1001	02	Viral pneumonia	Lower cost pulmonology, II
437200		3	10.021	1001	01	Viral pneumonia	Other moderate cost pulmonology
437400		1	10.011	1002	04	Bacterial lung infections	Lower cost pulmonology, I
437400		2	10.021	1002	03	Bacterial lung infections	Other moderate cost pulmonology
437400		3	10.061	1002	02	Bacterial lung infections	Other higher cost pulmonology, I
437400		4	10.062	1002	01	Bacterial lung infections	Other higher cost pulmonology, II
437600		1	10.021	1003	02	Fungal & other pneumonia	Other moderate cost pulmonology
437600		2	10.062	1003	01	Fungal & other pneumonia	Other higher cost pulmonology, II
437800		1	10.011	1004	02	Pulmonary tuberculosis	Lower cost pulmonology, I
437800		2	10.021	1004	01	Pulmonary tuberculosis	Other moderate cost pulmonology
437800		3	10.021	1004	01	Pulmonary tuberculosis	Other moderate cost pulmonology
438000		1	10.012	1006	03	Disseminated tuberculosis	Lower cost pulmonology, II
438000		2	10.021	1006	02	Disseminated tuberculosis	Other moderate cost pulmonology
438000		3	10.062	1006	01	Disseminated tuberculosis	Other higher cost pulmonology, II
438300		1	10.031	1005	06	Acute bronchitis	Acute bronchitis
438500		1	10.012	ign		Minor infectious pulmonary diseases, other than acute bronchitis	Lower cost pulmonology, II
438800		1	10.041	1005	05	Asthma	Asthma, chronic obstructive pulmonary disease, I
438800		2	10.042	1005	03	Asthma	Asthma, chronic obstructive pulmonary disease, II
438800		3	10.042	1005	03	Asthma	Asthma, chronic obstructive pulmonary disease, II
438800		4	10.043	1005	02	Asthma	Asthma, chronic obstructive pulmonary disease, III
439300		1	10.042	1005	03	Chronic obstructive pulmonary disease	Asthma, chronic obstructive pulmonary disease, II
439300		2	10.043	1005	02	Chronic obstructive pulmonary disease	Asthma, chronic obstructive pulmonary disease, III
439300		3	10.043	1005	02	Chronic obstructive pulmonary disease	Asthma, chronic obstructive pulmonary disease, III
439300		4	10.044	1005	01	Chronic obstructive pulmonary disease	Asthma, chronic obstructive pulmonary disease, IV
439700		1	10.021	1007	03	Occupational & environmental pulmonary diseases	Other moderate cost pulmonology
439700		2	10.061	1007	02	Occupational & environmental pulmonary diseases	Other higher cost pulmonology, I
439700		3	10.062	1007	01	Occupational & environmental pulmonary diseases	Other higher cost pulmonology, II
439800		1	10.021	ign		Other inflammatory lung diseases	Other moderate cost pulmonology
440000	0	1	10.052	1008	02	Malignant lung metastases	Malignant neoplasm, pulmonary, w/o active mgmt, with significant complication/comorbidity
440000	1	1	10.052	1008	02	Malignant lung metastases	Malignant neoplasm, pulmonary, w/o active mgmt, with significant complication/comorbidity
440000	2	1	10.053	1008	01	Malignant lung metastases	Malignant neoplasm, pulmonary, with active mgmt
440000	3	1	10.053	1008	01	Malignant lung metastases	Malignant neoplasm, pulmonary, with active mgmt
440100	0	1	10.051	1008	03	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, w/o active mgmt, w/o significant complication/comorbidity
440100	0	2	10.052	1008	02	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, w/o active mgmt, with significant complication/comorbidity
440100	0	3	10.052	1008	02	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, w/o active mgmt, with significant complication/comorbidity
440100	1	1	10.051	1008	03	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, w/o active mgmt, w/o significant complication/comorbidity
440100	1	2	10.052	1008	02	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, w/o active mgmt, with significant complication/comorbidity
440100	1	3	10.052	1008	02	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, w/o active mgmt, with significant complication/comorbidity
440100	2	1	10.053	1008	01	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, with active mgmt
440100	2	2	10.053	1008	01	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, with active mgmt
440100	2	3	10.053	1008	01	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, with active mgmt
440100	3	1	10.053	1008	01	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, with active mgmt

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
440100	3	2	10.053	1008	01	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, with active mgmt
440100	3	3	10.053	1008	01	Malignant neoplasm of pulmonary system	Malignant neoplasm, pulmonary, with active mgmt
440300		1	10.061	1008	04	Non-malignant neoplasm of pulmonary system	Other higher cost pulmonology, I
440400		1	10.012	ign		Chest trauma, open	Lower cost pulmonology, II
440600		1	10.012	ign		Chest trauma, closed	Lower cost pulmonology, II
440800		1	10.061	ign		Pulmonary congenital anomalies	Other higher cost pulmonology, I
441000		1	10.061	ign		Pulmonary embolism	Other higher cost pulmonology, I
441200		1	10.061	ign		Acute respiratory distress syndrome	Other higher cost pulmonology, I
441500		1	10.012	ign		Other pulmonary disorders	Lower cost pulmonology, II
449900		1	10.012	all		Pulmonology diseases signs & symptoms	Lower cost pulmonology, II
473100		1	11.011	1102	02	Infection of stomach & esophagus	Lower cost gastroenterology, I
473100		2	11.011	1102	02	Infection of stomach & esophagus	Lower cost gastroenterology, I
473100		3	11.013	1102	01	Infection of stomach & esophagus	Lower cost gastroenterology, III
473300		1	11.013	1103	02	Inflammation of esophagus	Lower cost gastroenterology, III
473300		2	11.013	1103	02	Inflammation of esophagus	Lower cost gastroenterology, III
473300		3	11.021	1103	01	Inflammation of esophagus	Other moderate cost gastroenterology, I
473500		1	11.011	1104	03	Gastritis &/or duodenitis	Lower cost gastroenterology, I
473500		2	11.013	1104	02	Gastritis &/or duodenitis	Lower cost gastroenterology, III
473500		3	11.021	1104	01	Gastritis &/or duodenitis	Other moderate cost gastroenterology, I
473800		1	11.013	1105	02	Ulcer	Lower cost gastroenterology, III
473800		2	11.013	1105	02	Ulcer	Lower cost gastroenterology, III
473800		3	11.022	1105	01	Ulcer	Other moderate cost gastroenterology, II
474000	0	1	11.052	1101	03	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, II
474000	0	2	11.052	1101	03	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, II
474000	1	1	11.052	1101	03	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, II
474000	1	2	11.052	1101	03	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, II
474000	2	1	11.053	1101	02	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, III
474000	2	2	11.054	1101	01	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, IV
474000	3	1	11.053	1101	02	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, III
474000	3	2	11.054	1101	01	Malignant neoplasm of stomach & esophagus	Malignant neoplasm, gastroenterology, IV
474200		1	11.013	1101	05	Non-malignant neoplasm of stomach & esophagus	Lower cost gastroenterology, III
474400		1	11.012	ign		Trauma of stomach or esophagus	Lower cost gastroenterology, II
474500		1	11.021	ign		Anomaly of stomach or esophagus	Other moderate cost gastroenterology, I
474700		1	11.061	ign		Appendicitis	Appendicitis
474900		1	11.011	1106	04	Diverticulitis & diverticulosis	Lower cost gastroenterology, I
474900		2	11.012	1106	03	Diverticulitis & diverticulosis	Lower cost gastroenterology, II
474900		3	11.013	1106	02	Diverticulitis & diverticulosis	Lower cost gastroenterology, III
474900		4	11.022	1106	01	Diverticulitis & diverticulosis	Other moderate cost gastroenterology, II
475000		1	11.011	ign		Other infectious diseases of intestines & abdomen	Lower cost gastroenterology, I
475200		1	11.022	1107	02	Other inflammation of intestines & abdomen	Other moderate cost gastroenterology, II
475200		2	11.042	1107	01	Other inflammation of intestines & abdomen	Other higher cost gastroenterology, II
475300		1	11.021	1108	02	Inflammatory bowel disease	Other moderate cost gastroenterology, I
475300		2	11.041	1108	01	Inflammatory bowel disease	Other higher cost gastroenterology, I
475300		3	11.041	1108	01	Inflammatory bowel disease	Other higher cost gastroenterology, I
475400	0	1	11.051	1101	04	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, I
475400	0	2	11.052	1101	03	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, II
475400	0	3	11.053	1101	02	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, III
475400	1	1	11.051	1101	04	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, I
475400	1	2	11.052	1101	03	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, II
475400	1	3	11.053	1101	02	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, III
475400	2	1	11.053	1101	02	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, III
475400	2	2	11.054	1101	01	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, IV
475400	2	3	11.054	1101	01	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, IV
475400	3	1	11.053	1101	02	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, III
475400	3	2	11.054	1101	01	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, IV
475400	3	3	11.054	1101	01	Malignant neoplasm of large intestine	Malignant neoplasm, gastroenterology, IV
475500	0	1	11.052	1101	03	Malignant neoplasm of small intestine & abdomen	Malignant neoplasm, gastroenterology, II
475500	1	1	11.052	1101	03	Malignant neoplasm of small intestine & abdomen	Malignant neoplasm, gastroenterology, II
475500	2	1	11.053	1101	02	Malignant neoplasm of small intestine & abdomen	Malignant neoplasm, gastroenterology, III
475500	3	1	11.053	1101	02	Malignant neoplasm of small intestine & abdomen	Malignant neoplasm, gastroenterology, III
475600		1	11.011	1101	06	Non-malignant neoplasm of intestines & abdomen	Lower cost gastroenterology, I
475600		2	11.013	1101	05	Non-malignant neoplasm of intestines & abdomen	Lower cost gastroenterology, III
475800		1	11.012	ign		Trauma of intestines & abdomen	Lower cost gastroenterology, II
476000		1	11.021	ign		Congenital anomalies of intestines & abdomen	Other moderate cost gastroenterology, I

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
476100		1	11.022	ign		Vascular diseases of intestines & abdomen	Other moderate cost gastroenterology, II
476300		1	11.022	1109	01	Bowel obstruction	Other moderate cost gastroenterology, II
476300		2	11.022	1109	01	Bowel obstruction	Other moderate cost gastroenterology, II
476400		1	11.013	1112	01	Irritable bowel syndrome	Lower cost gastroenterology, III
476600		1	11.031	1111	01	Hernias, except hiatal	Hernia
476600		2	11.031	1111	01	Hernias, except hiatal	Hernia
476600		3	11.031	1111	01	Hernias, except hiatal	Hernia
476800		1	11.031	1111	01	Hiatal hernia	Hernia
476900		1	11.013	ign		Other diseases of intestines & abdomen	Lower cost gastroenterology, III
477100		1	11.013	ign		Infection of rectum or anus	Lower cost gastroenterology, III
477400		1	11.011	ign		Hemorrhoids	Lower cost gastroenterology, I
477400		2	11.011	ign		Hemorrhoids	Lower cost gastroenterology, I
477600		1	11.013	ign		Inflammation of rectum or anus	Lower cost gastroenterology, III
477800	0	1	11.051	1101	04	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, I
477800	0	2	11.052	1101	03	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, II
477800	0	3	11.053	1101	02	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, III
477800	1	1	11.051	1101	04	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, I
477800	1	2	11.052	1101	03	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, II
477800	1	3	11.053	1101	02	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, III
477800	2	1	11.053	1101	02	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, III
477800	2	2	11.054	1101	01	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, IV
477800	2	3	11.054	1101	01	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, IV
477800	3	1	11.053	1101	02	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, III
477800	3	2	11.054	1101	01	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, IV
477800	3	3	11.054	1101	01	Malignant neoplasm of rectum or anus	Malignant neoplasm, gastroenterology, IV
478000		1	11.011	1101	06	Non-malignant neoplasm of rectum or anus	Lower cost gastroenterology, I
478300		1	11.012	ign		Trauma of rectum or anus, closed	Lower cost gastroenterology, II
478500		1	11.011	ign		Other diseases & disorders of rectum & anus	Lower cost gastroenterology, I
479900		1	11.011	all		Gastroenterology diseases signs & symptoms	Lower cost gastroenterology, I
521000		1	12.041	ign		Liver transplant	Liver transplant
521400		1	12.011	1201	04	Infectious hepatitis	Lower cost hepatology, I
521400		2	12.022	1201	03	Infectious hepatitis	Other moderate cost hepatology, II
521400		3	12.031	1201	01	Infectious hepatitis	Other higher cost hepatology, I
521600		1	12.011	1201	04	Non-infectious hepatitis	Lower cost hepatology, I
521600		2	12.012	1201	02	Non-infectious hepatitis	Lower cost hepatology, II
521800		1	12.032	ign		Cirrhosis	Other higher cost hepatology, II
521900		1	12.021	ign		Acute pancreatitis	Other moderate cost hepatology, I
522000		1	12.032	ign		Chronic pancreatitis	Other higher cost hepatology, II
522300		1	12.012	ign		Cholelithiasis	Lower cost hepatology, II
522300		2	12.021	ign		Cholelithiasis	Other moderate cost hepatology, I
522300		3	12.021	ign		Cholelithiasis	Other moderate cost hepatology, I
522400	0	1	12.051	1202	01	Malignant liver metastases	Malignant neoplasm, hepatobiliary system
522400	1	1	12.051	1202	01	Malignant liver metastases	Malignant neoplasm, hepatobiliary system
522400	2	1	12.051	1202	01	Malignant liver metastases	Malignant neoplasm, hepatobiliary system
522400	3	1	12.051	1202	01	Malignant liver metastases	Malignant neoplasm, hepatobiliary system
522500	0	1	12.051	1202	01	Malignant neoplasm of hepatobiliary system	Malignant neoplasm, hepatobiliary system
522500	1	1	12.051	1202	01	Malignant neoplasm of hepatobiliary system	Malignant neoplasm, hepatobiliary system
522500	2	1	12.051	1202	01	Malignant neoplasm of hepatobiliary system	Malignant neoplasm, hepatobiliary system
522500	3	1	12.051	1202	01	Malignant neoplasm of hepatobiliary system	Malignant neoplasm, hepatobiliary system
522700		1	12.031	1202	02	Non-malignant neoplasm of hepatobiliary system	Other higher cost hepatology, I
523000		1	12.021	ign		Trauma of hepatobiliary system	Other moderate cost hepatology, I
523000		2	12.021	ign		Trauma of hepatobiliary system	Other moderate cost hepatology, I
523200		1	12.011	ign		Other diseases of hepatobiliary system	Lower cost hepatology, I
529900		1	12.011	all		Hepatology diseases signs & symptoms	Lower cost hepatology, I
555000		1	13.031	1301	01	Kidney transplant	Kidney transplant
555200		1	13.051	1301	05	Acute renal failure	Acute renal failure
555400		1	13.041	1301	06	Chronic renal failure	Chronic renal failure, I
555400		2	13.042	1301	03	Chronic renal failure	Chronic renal failure, II
555400		3	13.042	1301	03	Chronic renal failure	Chronic renal failure, II
555400		4	13.043	1301	02	Chronic renal failure	Chronic renal failure, III
555600		1	13.021	1302	01	Acute renal inflammation	Other moderate cost nephrology
555800		1	13.021	1302	01	Chronic renal inflammation	Other moderate cost nephrology
556000		1	13.021	1302	01	Nephrotic syndrome	Other moderate cost nephrology
556000		2	13.021	1302	01	Nephrotic syndrome	Other moderate cost nephrology

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
556100		1	13.011	1302	02	Other renal conditions	Lower cost nephrology
559900		1	13.011	all		Nephrology diseases signs & symptoms	Lower cost nephrology
587100		1	14.012	ign		Infection of upper genitourinary system	Lower cost urology, II
587200		1	14.011	ign		Sexually transmitted diseases, primary	Lower cost urology, I
587300		1	14.011	ign		Sexually transmitted diseases, disseminated	Lower cost urology, I
587400		1	14.011	1402	02	Infection of lower genitourinary system, not sexually transmitted	Lower cost urology, I
587400		2	14.011	1402	02	Infection of lower genitourinary system, not sexually transmitted	Lower cost urology, I
587400		3	14.021	1402	01	Infection of lower genitourinary system, not sexually transmitted	Other moderate cost urology
587800		1	14.021	1405	01	Kidney stones	Other moderate cost urology
587800		2	14.021	1405	01	Kidney stones	Other moderate cost urology
587800		3	14.021	1405	01	Kidney stones	Other moderate cost urology
588000		1	14.012	1403	02	Inflammation of genitourinary system, except kidney stones	Lower cost urology, II
588000		2	14.021	1403	01	Inflammation of genitourinary system, except kidney stones	Other moderate cost urology
588000		3	14.021	1403	01	Inflammation of genitourinary system, except kidney stones	Other moderate cost urology
588200	0	1	14.031	1401	04	Malignant neoplasm of prostate	Malignant neoplasm, urology, I
588200	0	2	14.031	1401	04	Malignant neoplasm of prostate	Malignant neoplasm, urology, I
588200	0	3	14.032	1401	03	Malignant neoplasm of prostate	Malignant neoplasm, urology, II
588200	1	1	14.031	1401	04	Malignant neoplasm of prostate	Malignant neoplasm, urology, I
588200	1	2	14.031	1401	04	Malignant neoplasm of prostate	Malignant neoplasm, urology, I
588200	1	3	14.032	1401	03	Malignant neoplasm of prostate	Malignant neoplasm, urology, II
588200	2	1	14.032	1401	03	Malignant neoplasm of prostate	Malignant neoplasm, urology, II
588200	2	2	14.033	1401	02	Malignant neoplasm of prostate	Malignant neoplasm, urology, III
588200	2	3	14.034	1401	01	Malignant neoplasm of prostate	Malignant neoplasm, urology, IV
588200	3	1	14.032	1401	03	Malignant neoplasm of prostate	Malignant neoplasm, urology, II
588200	3	2	14.033	1401	02	Malignant neoplasm of prostate	Malignant neoplasm, urology, III
588200	3	3	14.034	1401	01	Malignant neoplasm of prostate	Malignant neoplasm, urology, IV
588400		1	14.011	1401	06	Non-malignant neoplasm of prostate	Lower cost urology, I
588400		2	14.012	1401	05	Non-malignant neoplasm of prostate	Lower cost urology, II
588600	0	1	14.031	1401	04	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, I
588600	0	2	14.032	1401	03	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, II
588600	1	1	14.031	1401	04	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, I
588600	1	2	14.032	1401	03	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, II
588600	2	1	14.033	1401	02	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, III
588600	2	2	14.034	1401	01	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, IV
588600	3	1	14.033	1401	02	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, III
588600	3	2	14.034	1401	01	Malignant neoplasm of genitourinary system, except prostate	Malignant neoplasm, urology, IV
588800		1	14.012	1401	05	Non-malignant neoplasm of genitourinary system, except prostate	Lower cost urology, II
589000		1	14.011	ign		Trauma to genitourinary system	Lower cost urology, I
589200		1	14.011	1404	03	Urinary incontinence	Lower cost urology, I
589200		2	14.012	1404	02	Urinary incontinence	Lower cost urology, II
589200		3	14.012	1404	02	Urinary incontinence	Lower cost urology, II
589200		4	14.021	1404	01	Urinary incontinence	Other moderate cost urology
589300		1	14.011	ign		Male infertility	Lower cost urology, I
589500		1	14.011	ign		Other diseases of genitourinary system	Lower cost urology, I
589900		1	14.011	all		Urological diseases signs & symptoms	Lower cost urology, I
601100		1	15.011	1501	02	Pregnancy, with delivery	Normal pregnancy, delivery, I
601100		2	15.011	1501	02	Pregnancy, with delivery	Normal pregnancy, delivery, I
601100		3	15.012	1501	01	Pregnancy, with delivery	Normal pregnancy, delivery, II
602100		1	15.032	1501	03	Ectopic pregnancy	Other moderate cost obstetrics, II
602200		1	15.032	1501	03	Spontaneous abortion	Other moderate cost obstetrics, II
602300		1	15.031	1501	05	Induced abortion	Other moderate cost obstetrics, I
602400		1	15.021	1501	04	Pregnancy, not yet delivered	Normal pregnancy, non-delivery
633200		1	16.021	ign		Infection of ovary &/or fallopian tubes	Other moderate cost gynecology, I
633500		1	16.021	ign		Infection of uterus	Other moderate cost gynecology, I
633700		1	16.011	ign		Infection of cervix	Lower cost gynecology, I
633900		1	16.011	ign		Monilial infection of vagina (yeast)	Lower cost gynecology, I
634000		1	16.011	ign		Infection of vagina except monilial	Lower cost gynecology, I
634200		1	16.022	ign		Endometriosis	Other moderate cost gynecology, II
634300		1	16.011	ign		Inflammatory condition of female genital tract, except endometriosis	Lower cost gynecology, I
634400	0	1	16.035	1601	07	Malignant neoplasm of cervix	Malignant neoplasm, breast/female genital tract, w/o active mgmt, w/o significant complication/comorbidity, I
634400	1	1	16.035	1601	07	Malignant neoplasm of cervix	Malignant neoplasm, breast/female genital tract, w/o active mgmt, w/o significant complication/comorbidity, I
634400	2	1	16.033	1601	02	Malignant neoplasm of cervix	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, II
634400	3	1	16.033	1601	02	Malignant neoplasm of cervix	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, II
634500	0	1	16.034	1601	05	Malignant neoplasm of ovaries	Malignant neoplasm, breast/female genital tract, w/o active mgmt, with significant complication/comorbidity

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
634500	1	1	16.034	1601	05	Malignant neoplasm of ovaries	Malignant neoplasm, breast/female genital tract, w/o active mgmt, with significant complication/comorbidity
634500	2	1	16.031	1601	01	Malignant neoplasm of ovaries	Malignant neoplasm, breast/female genital tract, with active mgmt, with significant complication/comorbidity
634500	3	1	16.031	1601	01	Malignant neoplasm of ovaries	Malignant neoplasm, breast/female genital tract, with active mgmt, with significant complication/comorbidity
634600	0	1	16.036	1601	06	Malignant neoplasm of uterus	Malignant neoplasm, breast/female genital tract, w/o active mgmt, w/o significant complication/comorbidity, II
634600	1	1	16.036	1601	06	Malignant neoplasm of uterus	Malignant neoplasm, breast/female genital tract, w/o active mgmt, w/o significant complication/comorbidity, II
634600	2	1	16.033	1601	02	Malignant neoplasm of uterus	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, II
634600	3	1	16.033	1601	02	Malignant neoplasm of uterus	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, II
634700		1	16.012	1601	09	Non-malignant neoplasm of female genital tract	Lower cost gynecology, II
634700		2	16.021	1601	08	Non-malignant neoplasm of female genital tract	Other moderate cost gynecology, I
634700		3	16.021	1601	08	Non-malignant neoplasm of female genital tract	Other moderate cost gynecology, I
634700		4	16.021	1601	08	Non-malignant neoplasm of female genital tract	Other moderate cost gynecology, I
634900		1	16.011	ign		Conditions associated with menstruation	Lower cost gynecology, I
634900		2	16.011	ign		Conditions associated with menstruation	Lower cost gynecology, I
635100		1	16.023	ign		Conditions associated with infertility	Other moderate cost gynecology, III
635300		1	16.012	ign		Other diseases of female genital tract	Lower cost gynecology, II
635600	0	1	16.036	1601	06	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, w/o active mgmt, w/o significant complication/comorbidity, II
635600	0	2	16.034	1601	05	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, w/o active mgmt, with significant complication/comorbidity
635600	0	3	16.034	1601	05	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, w/o active mgmt, with significant complication/comorbidity
635600	1	1	16.036	1601	06	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, w/o active mgmt, w/o significant complication/comorbidity, II
635600	1	2	16.034	1601	05	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, w/o active mgmt, with significant complication/comorbidity
635600	1	3	16.034	1601	05	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, w/o active mgmt, with significant complication/comorbidity
635600	2	1	16.032	1601	03	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, I
635600	2	2	16.033	1601	02	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, II
635600	2	3	16.031	1601	01	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, with active mgmt, with significant complication/comorbidity
635600	3	1	16.032	1601	03	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, I
635600	3	2	16.033	1601	02	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, with active mgmt, w/o significant complication/comorbidity, II
635600	3	3	16.031	1601	01	Malignant neoplasm of breast	Malignant neoplasm, breast/female genital tract, with active mgmt, with significant complication/comorbidity
635800		1	16.011	1601	10	Non-malignant neoplasm of breast	Lower cost gynecology, I
635800		2	16.012	1601	09	Non-malignant neoplasm of breast	Lower cost gynecology, II
636000		1	16.011	ign		Other disorders of breast	Lower cost gynecology, I
639900		1	16.011	ign		Gynecological signs & symptoms	Lower cost gynecology, I
666700		1	17.011	1709	01	Acne	Lower cost dermatology, I
666800		1	17.011	ign		Contact dermatitis	Lower cost dermatology, I
666900		1	17.012	1701	02	Psoriasis	Lower cost dermatology, II
666900		2	17.022	1701	01	Psoriasis	Other moderate cost dermatology, II
667000		1	17.021	1702	03	Chronic skin ulcers	Other moderate cost dermatology, I
667000		2	17.022	1702	02	Chronic skin ulcers	Other moderate cost dermatology, II
667000		3	17.031	1702	01	Chronic skin ulcers	Other higher cost dermatology
667200		1	17.011	1703	02	Bacterial infection of skin	Lower cost dermatology, I
667200		2	17.012	1703	01	Bacterial infection of skin	Lower cost dermatology, II
667200		3	17.012	1703	01	Bacterial infection of skin	Lower cost dermatology, II
667300		1	17.011	ign		Viral skin infection	Lower cost dermatology, I
667500		1	17.011	1710	01	Fungal skin infection	Lower cost dermatology, I
667600		1	17.011	ign		Parasitic skin infection	Lower cost dermatology, I
667800		1	17.011	1704	02	Other inflammation of skin	Lower cost dermatology, I
667800		2	17.011	1704	02	Other inflammation of skin	Lower cost dermatology, I
667800		3	17.011	1704	02	Other inflammation of skin	Lower cost dermatology, I
667800		4	17.012	1704	01	Other inflammation of skin	Lower cost dermatology, II
668000	0	1	17.012	1705	03	Malignant neoplasm of skin, major	Lower cost dermatology, II
668000	0	2	17.012	1705	03	Malignant neoplasm of skin, major	Lower cost dermatology, II
668000	0	3	17.012	1705	03	Malignant neoplasm of skin, major	Lower cost dermatology, II
668000	1	1	17.012	1705	03	Malignant neoplasm of skin, major	Lower cost dermatology, II
668000	1	2	17.012	1705	03	Malignant neoplasm of skin, major	Lower cost dermatology, II
668000	1	3	17.012	1705	03	Malignant neoplasm of skin, major	Lower cost dermatology, II
668000	2	1	17.022	1705	02	Malignant neoplasm of skin, major	Other moderate cost dermatology, II
668000	2	2	17.031	1705	01	Malignant neoplasm of skin, major	Other higher cost dermatology
668000	2	3	17.031	1705	01	Malignant neoplasm of skin, major	Other higher cost dermatology
668000	3	1	17.022	1705	02	Malignant neoplasm of skin, major	Other moderate cost dermatology, II
668000	3	2	17.031	1705	01	Malignant neoplasm of skin, major	Other higher cost dermatology
668000	3	3	17.031	1705	01	Malignant neoplasm of skin, major	Other higher cost dermatology
668100	0	1	17.012	1705	03	Malignant neoplasm of skin, minor	Lower cost dermatology, II
668100	1	1	17.012	1705	03	Malignant neoplasm of skin, minor	Lower cost dermatology, II
668200		1	17.011	1705	04	Non-malignant neoplasm of skin	Lower cost dermatology, I
668200		2	17.011	1705	04	Non-malignant neoplasm of skin	Lower cost dermatology, I

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
668700		1	17.011	1706	02	Burns	Lower cost dermatology, I
668700		2	17.012	1706	01	Burns	Lower cost dermatology, II
668700		3	17.012	1706	01	Burns	Lower cost dermatology, II
668901		1	17.011	1707	03	Open wound - foot & ankle	Lower cost dermatology, I
668901		2	17.012	1707	02	Open wound - foot & ankle	Lower cost dermatology, II
668902		1	17.011	1707	03	Open wound - lower leg	Lower cost dermatology, I
668902		2	17.012	1707	02	Open wound - lower leg	Lower cost dermatology, II
668903		1	17.011	1707	03	Open wound - hip & thigh	Lower cost dermatology, I
668903		2	17.012	1707	02	Open wound - hip & thigh	Lower cost dermatology, II
668904		1	17.011	1707	03	Open wound - hand & forearm	Lower cost dermatology, I
668904		2	17.011	1707	03	Open wound - hand & forearm	Lower cost dermatology, I
668905		1	17.011	1707	03	Open wound - elbow & upper arm	Lower cost dermatology, I
668905		2	17.012	1707	02	Open wound - elbow & upper arm	Lower cost dermatology, II
668906		1	17.012	1707	02	Open wound - shoulder	Lower cost dermatology, II
668907		1	17.011	1707	03	Open wound - head & face	Lower cost dermatology, I
668907		2	17.011	1707	03	Open wound - head & face	Lower cost dermatology, I
668909		1	17.012	1707	02	Open wound - trunk	Lower cost dermatology, II
668909		2	17.021	1707	01	Open wound - trunk	Other moderate cost dermatology, I
668912		1	17.011	1707	03	Open wound - unspecified	Lower cost dermatology, I
669001		1	17.011	1708	03	Skin trauma, except burn & open wound - foot & ankle	Lower cost dermatology, I
669001		2	17.021	1708	01	Skin trauma, except burn & open wound - foot & ankle	Other moderate cost dermatology, I
669002		1	17.011	1708	03	Skin trauma, except burn & open wound - lower leg	Lower cost dermatology, I
669002		2	17.021	1708	01	Skin trauma, except burn & open wound - lower leg	Other moderate cost dermatology, I
669003		1	17.011	1708	03	Skin trauma, except burn & open wound - hip & thigh	Lower cost dermatology, I
669003		2	17.021	1708	01	Skin trauma, except burn & open wound - hip & thigh	Other moderate cost dermatology, I
669004		1	17.011	1708	03	Skin trauma, except burn & open wound - hand & forearm	Lower cost dermatology, I
669005		1	17.011	1708	03	Skin trauma, except burn & open wound - elbow & upper arm	Lower cost dermatology, I
669006		1	17.011	1708	03	Skin trauma, except burn & open wound - shoulder	Lower cost dermatology, I
669007		1	17.011	1708	03	Skin trauma, except burn & open wound - head & face	Lower cost dermatology, I
669007		2	17.011	1708	03	Skin trauma, except burn & open wound - head & face	Lower cost dermatology, I
669007		3	17.012	1708	02	Skin trauma, except burn & open wound - head & face	Lower cost dermatology, II
669009		1	17.011	1708	03	Skin trauma, except burn & open wound - trunk	Lower cost dermatology, I
669009		2	17.012	1708	02	Skin trauma, except burn & open wound - trunk	Lower cost dermatology, II
669009		3	17.021	1708	01	Skin trauma, except burn & open wound - trunk	Other moderate cost dermatology, I
669010		1	17.011	1708	03	Skin trauma, except burn & open wound - other	Lower cost dermatology, I
669010		2	17.011	1708	03	Skin trauma, except burn & open wound - other	Lower cost dermatology, I
669012		1	17.011	1708	03	Skin trauma, except burn & open wound - unspecified	Lower cost dermatology, I
669100		1	17.011	ign		Other skin disorders	Lower cost dermatology, I
669900		1	17.011	all		Dermatological signs & symptoms	Lower cost dermatology, I
711101		1	18.042	ign		Infection of bone & joint - foot & ankle	Other higher cost orthopedics, II
711102		1	18.042	ign		Infection of bone & joint - knee & lower leg	Other higher cost orthopedics, II
711103		1	18.042	ign		Infection of bone & joint - thigh, hip & pelvis	Other higher cost orthopedics, II
711104		1	18.042	ign		Infection of bone & joint - hand, wrist & forearm	Other higher cost orthopedics, II
711105		1	18.042	ign		Infection of bone & joint - elbow & upper arm	Other higher cost orthopedics, II
711106		1	18.042	ign		Infection of bone & joint - shoulder	Other higher cost orthopedics, II
711112		1	18.042	ign		Infection of bone & joint - unspecified	Other higher cost orthopedics, II
711200		1	18.041	1805	02	Juvenile rheumatoid arthritis	Other higher cost orthopedics, I
711400		1	18.051	1805	01	Adult rheumatoid arthritis	Adult rheumatoid arthritis
711400		2	18.051	1805	01	Adult rheumatoid arthritis	Adult rheumatoid arthritis
711600		1	18.041	1801	01	Lupus	Other higher cost orthopedics, I
711600		2	18.041	1801	01	Lupus	Other higher cost orthopedics, I
711700		1	18.041	ign		Autoimmune rheumatologic diseases, except lupus	Other higher cost orthopedics, I
711901		1	18.031	1802	03	Major joint inflammation - foot & ankle	Joint degeneration & major joint inflammation, I
711902		1	18.031	1802	03	Major joint inflammation - knee & lower leg	Joint degeneration & major joint inflammation, I
711903		1	18.033	1802	01	Major joint inflammation - thigh, hip & pelvis	Joint degeneration & major joint inflammation, III
711904		1	18.031	1802	03	Major joint inflammation - hand, wrist & forearm	Joint degeneration & major joint inflammation, I
711905		1	18.031	1802	03	Major joint inflammation - elbow & upper arm	Joint degeneration & major joint inflammation, I
711906		1	18.032	1802	02	Major joint inflammation - shoulder	Joint degeneration & major joint inflammation, II
711908		1	18.031	1802	03	Major joint inflammation - back	Joint degeneration & major joint inflammation, I
711910		1	18.031	1802	03	Major joint inflammation - other	Joint degeneration & major joint inflammation, I
711912		1	18.032	1802	02	Major joint inflammation - unspecified	Joint degeneration & major joint inflammation, II
712000		1	18.011	1812	01	Osteoporosis	Lower cost orthopedics, I
712201		1	18.031	1802	03	Joint degeneration, localized - foot & ankle	Joint degeneration & major joint inflammation, I
712202		1	18.032	1802	02	Joint degeneration, localized - knee & lower leg	Joint degeneration & major joint inflammation, II

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
712202		2	18.032	1802	02	Joint degeneration, localized - knee & lower leg	Joint degeneration & major joint inflammation, II
712202		3	18.033	1802	01	Joint degeneration, localized - knee & lower leg	Joint degeneration & major joint inflammation, III
712203		1	18.031	1802	03	Joint degeneration, localized - thigh, hip & pelvis	Joint degeneration & major joint inflammation, I
712203		2	18.033	1802	01	Joint degeneration, localized - thigh, hip & pelvis	Joint degeneration & major joint inflammation, III
712203		3	18.033	1802	01	Joint degeneration, localized - thigh, hip & pelvis	Joint degeneration & major joint inflammation, III
712204		1	18.031	1802	03	Joint degeneration, localized - hand, wrist & forearm	Joint degeneration & major joint inflammation, I
712205		1	18.031	1802	03	Joint degeneration, localized - elbow & upper arm	Joint degeneration & major joint inflammation, I
712206		1	18.031	1802	03	Joint degeneration, localized - shoulder	Joint degeneration & major joint inflammation, I
712208		1	18.031	1802	03	Joint degeneration, localized - back	Joint degeneration & major joint inflammation, I
712208		2	18.032	1802	02	Joint degeneration, localized - back	Joint degeneration & major joint inflammation, II
712208		3	18.033	1802	01	Joint degeneration, localized - back	Joint degeneration & major joint inflammation, III
712211		1	18.031	1802	03	Joint degeneration, localized - neck	Joint degeneration & major joint inflammation, I
712211		2	18.031	1802	03	Joint degeneration, localized - neck	Joint degeneration & major joint inflammation, I
712211		3	18.032	1802	02	Joint degeneration, localized - neck	Joint degeneration & major joint inflammation, II
712212		1	18.031	1802	03	Joint degeneration, localized - unspecified	Joint degeneration & major joint inflammation, I
712901		1	18.024	1807	02	Open fracture or dislocation of lower extremity - foot & ankle	Orthopedic trauma, fracture or dislocation, IV
712902		1	18.024	1807	02	Open fracture or dislocation of lower extremity - knee & lower leg	Orthopedic trauma, fracture or dislocation, IV
712903		1	18.025	1807	01	Open fracture or dislocation - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, V
712904		1	18.023	1807	03	Open fracture or dislocation of upper extremity - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, III
712905		1	18.024	1807	02	Open fracture or dislocation of upper extremity - elbow & upper arm	Orthopedic trauma, fracture or dislocation, IV
712906		1	18.023	1807	03	Open fracture or dislocation of upper extremity - shoulder	Orthopedic trauma, fracture or dislocation, III
712907		1	18.023	1807	03	Open fracture or dislocation - head & face	Orthopedic trauma, fracture or dislocation, III
712909		1	18.024	1807	02	Open fracture or dislocation - trunk	Orthopedic trauma, fracture or dislocation, IV
713101		1	18.023	1807	03	Closed fracture or dislocation of lower extremity - foot & ankle	Orthopedic trauma, fracture or dislocation, III
713101		2	18.023	1807	03	Closed fracture or dislocation of lower extremity - foot & ankle	Orthopedic trauma, fracture or dislocation, III
713101		3	18.023	1807	03	Closed fracture or dislocation of lower extremity - foot & ankle	Orthopedic trauma, fracture or dislocation, III
713102		1	18.023	1807	03	Closed fracture or dislocation of lower extremity - knee & lower leg	Orthopedic trauma, fracture or dislocation, III
713103		1	18.024	1807	02	Closed fracture or dislocation - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, IV
713103		2	18.025	1807	01	Closed fracture or dislocation - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, V
713103		3	18.025	1807	01	Closed fracture or dislocation - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, V
713104		1	18.021	1807	05	Closed fracture or dislocation of upper extremity - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, I
713104		2	18.021	1807	05	Closed fracture or dislocation of upper extremity - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, I
713104		3	18.023	1807	03	Closed fracture or dislocation of upper extremity - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, III
713105		1	18.021	1807	05	Closed fracture or dislocation of upper extremity - elbow & upper arm	Orthopedic trauma, fracture or dislocation, I
713105		2	18.023	1807	03	Closed fracture or dislocation of upper extremity - elbow & upper arm	Orthopedic trauma, fracture or dislocation, III
713105		3	18.024	1807	02	Closed fracture or dislocation of upper extremity - elbow & upper arm	Orthopedic trauma, fracture or dislocation, IV
713106		1	18.023	1807	03	Closed fracture or dislocation of upper extremity - shoulder	Orthopedic trauma, fracture or dislocation, III
713107		1	18.023	1807	03	Closed fracture or dislocation - head & face	Orthopedic trauma, fracture or dislocation, III
713109		1	18.023	1807	03	Closed fracture or dislocation of trunk	Orthopedic trauma, fracture or dislocation, III
713600	0	1	18.062	1804	01	Malignant bone metastases	Malignant neoplasm, bone & connective tissue, II
713600	1	1	18.062	1804	01	Malignant bone metastases	Malignant neoplasm, bone & connective tissue, II
713600	2	1	18.062	1804	01	Malignant bone metastases	Malignant neoplasm, bone & connective tissue, II
713600	3	1	18.062	1804	01	Malignant bone metastases	Malignant neoplasm, bone & connective tissue, II
713800	0	1	18.061	1804	02	Malignant neoplasm of bone & connective tissue, head & neck	Malignant neoplasm, bone & connective tissue, I
713800	1	1	18.061	1804	02	Malignant neoplasm of bone & connective tissue, head & neck	Malignant neoplasm, bone & connective tissue, I
713800	2	1	18.062	1804	01	Malignant neoplasm of bone & connective tissue, head & neck	Malignant neoplasm, bone & connective tissue, II
713800	3	1	18.062	1804	01	Malignant neoplasm of bone & connective tissue, head & neck	Malignant neoplasm, bone & connective tissue, II
713900	0	1	18.061	1804	02	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, I
713900	0	2	18.061	1804	02	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, I
713900	1	1	18.061	1804	02	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, I
713900	1	2	18.061	1804	02	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, I
713900	2	1	18.062	1804	01	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, II
713900	2	2	18.062	1804	01	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, II
713900	3	1	18.062	1804	01	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, II
713900	3	2	18.062	1804	01	Malignant neoplasm of bone & connective tissue, other than head & neck	Malignant neoplasm, bone & connective tissue, II
714000		1	18.012	1804	03	Non-malignant neoplasm of bone & connective tissue, head & neck	Lower cost orthopedics, II
714100		1	18.012	1804	03	Non-malignant neoplasm of bone & connective tissue, other than head & neck	Lower cost orthopedics, II
714301		1	18.023	1807	03	Joint derangement - foot & ankle	Orthopedic trauma, fracture or dislocation, III
714302		1	18.023	1807	03	Joint derangement - knee & lower leg	Orthopedic trauma, fracture or dislocation, III
714302		2	18.023	1807	03	Joint derangement - knee & lower leg	Orthopedic trauma, fracture or dislocation, III
714303		1	18.024	1807	02	Joint derangement - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, IV
714304		1	18.023	1807	03	Joint derangement - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, III
714305		1	18.024	1807	02	Joint derangement - elbow & upper arm	Orthopedic trauma, fracture or dislocation, IV
714306		1	18.024	1807	02	Joint derangement - shoulder	Orthopedic trauma, fracture or dislocation, IV

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
714312		1	18.024	1807	02	Joint derangement - unspecified	Orthopedic trauma, fracture or dislocation, IV
714501		1	18.024	1807	02	Major trauma, other than fracture or dislocation - foot & ankle	Orthopedic trauma, fracture or dislocation, IV
714502		1	18.024	1807	02	Major trauma, other than fracture or dislocation - knee & lower leg	Orthopedic trauma, fracture or dislocation, IV
714503		1	18.024	1807	02	Major trauma, other than fracture or dislocation - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, IV
714504		1	18.023	1807	03	Major trauma, other than fracture or dislocation - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, III
714505		1	18.023	1807	03	Major trauma, other than fracture or dislocation - elbow & upper arm	Orthopedic trauma, fracture or dislocation, III
714506		1	18.024	1807	02	Major trauma, other than fracture or dislocation - shoulder	Orthopedic trauma, fracture or dislocation, IV
714509		1	18.025	1807	01	Major trauma, other than fracture or dislocation - trunk	Orthopedic trauma, fracture or dislocation, V
714512		1	18.025	1807	01	Major trauma, other than fracture or dislocation - unspecified	Orthopedic trauma, fracture or dislocation, V
714601		1	18.022	1807	04	Minor orthopedic trauma - foot & ankle	Orthopedic trauma, fracture or dislocation, II
714602		1	18.022	1807	04	Minor orthopedic trauma - knee & lower leg	Orthopedic trauma, fracture or dislocation, II
714603		1	18.022	1807	04	Minor orthopedic trauma - thigh, hip & pelvis	Orthopedic trauma, fracture or dislocation, II
714604		1	18.022	1807	04	Minor orthopedic trauma - hand, wrist & forearm	Orthopedic trauma, fracture or dislocation, II
714605		1	18.022	1807	04	Minor orthopedic trauma - elbow & upper arm	Orthopedic trauma, fracture or dislocation, II
714606		1	18.022	1807	04	Minor orthopedic trauma - shoulder	Orthopedic trauma, fracture or dislocation, II
714607		1	18.022	1807	04	Minor orthopedic trauma - head & face	Orthopedic trauma, fracture or dislocation, II
714608		1	18.022	1807	04	Minor orthopedic trauma - back	Orthopedic trauma, fracture or dislocation, II
714609		1	18.022	1807	04	Minor orthopedic trauma - trunk	Orthopedic trauma, fracture or dislocation, II
714611		1	18.022	1807	04	Minor orthopedic trauma - neck	Orthopedic trauma, fracture or dislocation, II
714612		1	18.022	1807	04	Minor orthopedic trauma - unspecified	Orthopedic trauma, fracture or dislocation, II
714801		1	18.011	1808	02	Bursitis & tendinitis - foot & ankle	Lower cost orthopedics, I
714802		1	18.011	1808	02	Bursitis & tendinitis - knee & lower leg	Lower cost orthopedics, I
714803		1	18.011	1808	02	Bursitis & tendinitis - thigh, hip & pelvis	Lower cost orthopedics, I
714804		1	18.011	1808	02	Bursitis & tendinitis - hand, wrist & forearm	Lower cost orthopedics, I
714805		1	18.011	1808	02	Bursitis & tendinitis - elbow & upper arm	Lower cost orthopedics, I
714806		1	18.012	1808	01	Bursitis & tendinitis - shoulder	Lower cost orthopedics, II
714806		2	18.012	1808	01	Bursitis & tendinitis - shoulder	Lower cost orthopedics, II
714812		1	18.011	1808	02	Bursitis & tendinitis - unspecified	Lower cost orthopedics, I
714901		1	18.011	ign		Other minor orthopedic disorders - foot & ankle	Lower cost orthopedics, I
714902		1	18.011	ign		Other minor orthopedic disorders - knee & lower leg	Lower cost orthopedics, I
714903		1	18.011	ign		Other minor orthopedic disorders - thigh, hip & pelvis	Lower cost orthopedics, I
714904		1	18.011	ign		Other minor orthopedic disorders - hand, wrist & forearm	Lower cost orthopedics, I
714905		1	18.011	ign		Other minor orthopedic disorders - elbow & upper arm	Lower cost orthopedics, I
714906		1	18.011	ign		Other minor orthopedic disorders - shoulder	Lower cost orthopedics, I
714908		1	18.011	ign		Other minor orthopedic disorders - back	Lower cost orthopedics, I
714911		1	18.011	ign		Other minor orthopedic disorders - neck	Lower cost orthopedics, I
714912		1	18.011	ign		Other minor orthopedic disorders - unspecified	Lower cost orthopedics, I
715101		1	18.012	1811	01	Orthopedic deformity - foot & ankle	Lower cost orthopedics, II
715101		2	18.012	1811	01	Orthopedic deformity - foot & ankle	Lower cost orthopedics, II
715102		1	18.012	1811	01	Orthopedic deformity - knee & lower leg	Lower cost orthopedics, II
715103		1	18.012	1811	01	Orthopedic deformity - thigh, hip & pelvis	Lower cost orthopedics, II
715104		1	18.012	1811	01	Orthopedic deformity - hand, wrist & forearm	Lower cost orthopedics, II
715105		1	18.012	1811	01	Orthopedic deformity - elbow & upper arm	Lower cost orthopedics, II
715106		1	18.012	1811	01	Orthopedic deformity - shoulder	Lower cost orthopedics, II
715107		1	18.012	1811	01	Orthopedic deformity - head & face	Lower cost orthopedics, II
715108		1	18.012	1811	01	Orthopedic deformity - back	Lower cost orthopedics, II
715109		1	18.012	1811	01	Orthopedic deformity - trunk	Lower cost orthopedics, II
715111		1	18.012	1811	01	Orthopedic deformity - neck	Lower cost orthopedics, II
715112		1	18.012	1811	01	Orthopedic deformity - unspecified	Lower cost orthopedics, II
719901		1	18.011	all		Orthopedic signs & symptoms - foot & ankle	Lower cost orthopedics, I
719902		1	18.011	all		Orthopedic signs & symptoms - knee & lower leg	Lower cost orthopedics, I
719903		1	18.011	all		Orthopedic signs & symptoms - thigh, hip & pelvis	Lower cost orthopedics, I
719904		1	18.011	all		Orthopedic signs & symptoms - hand, wrist & forearm	Lower cost orthopedics, I
719905		1	18.011	all		Orthopedic signs & symptoms - elbow & upper arm	Lower cost orthopedics, I
719906		1	18.011	all		Orthopedic signs & symptoms - shoulder	Lower cost orthopedics, I
719908		1	18.011	all		Orthopedic signs & symptoms - back	Lower cost orthopedics, I
719911		1	18.011	all		Orthopedic signs & symptoms - neck	Lower cost orthopedics, I
719912		1	18.011	all		Orthopedic signs & symptoms - unspecified	Lower cost orthopedics, I
748000		1	19.011	1901	04	Uncomplicated neonatal management	Other neonatal, I
748100		1	19.021	1901	01	Chromosomal anomalies	Other higher cost neonatal
748200		1	19.013	1901	02	Metabolic related disorders, antenatal origin	Other neonatal, III
748300		1	19.013	1901	02	Chemical dependency related disorders, antenatal origin	Other neonatal, III
748400		1	19.012	1901	03	Mechanical related disorders, antenatal origin	Other neonatal, II
748500		1	19.012	1901	03	Other disorders, antenatal origin	Other neonatal, II

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
748700		1	19.011	1901	04	Other neonatal disorders, perinatal origin	Other neonatal, I
748700		2	19.013	1901	02	Other neonatal disorders, perinatal origin	Other neonatal, III
749900		1	19.011	all		Neonatal diseases signs & symptoms	Other neonatal, I
821000		1	21.011	ign		Late effects & late complications	Late effects & complications
821100		1	21.021	ign		Environmental trauma	Environmental trauma
821200		1	21.031	2101	03	Poisonings & toxic effects of drugs	Poisonings & toxic effects of drugs, I
821200		2	21.032	2101	02	Poisonings & toxic effects of drugs	Poisonings & toxic effects of drugs, II
821200		3	21.033	2101	01	Poisonings & toxic effects of drugs	Poisonings & toxic effects of drugs, III
901000		1	01.051	0101	11	Ongoing Rx Tx wo Prov intervention - Non-HIV antiviral treatment	Viral diseases
901100		1	01.042	0101	04	Ongoing Rx Tx wo Prov intervention - HIV/AIDS antiviral treatment	AIDS/HIV, II
901200		1	01.034	0101	07	Ongoing Rx Tx wo Prov intervention - Leprosy treatment	Non-HIV major infectious diseases, IV
901400		1	02.011	ign		Ongoing Rx Tx wo Prov intervention - Hyperuricemia/gout treatment	Lower cost endocrinology, I
901500		1	02.011	0215	03	Ongoing Rx Tx wo Prov intervention - Impotence treatment	Lower cost endocrinology, I
901600		1	02.031	0209	02	Ongoing Rx Tx wo Prov intervention - Antihyperlipidemic treatment	Hyperlipidemia, excluding lipidoses
901700		1	02.012	0211	03	Ongoing Rx Tx wo Prov intervention - Nutritional treatment	Lower cost endocrinology, II
901800		1	02.012	0203	03	Ongoing Rx Tx wo Prov intervention - Pancreatic enzyme replacement treatment	Lower cost endocrinology, II
901900		1	RX.011	ign		Ongoing Rx Tx wo Prov intervention - Respiratory enzyme deficiency treatment	High cost pharmacy only
902000		1	02.011	0201	03	Ongoing Rx Tx wo Prov intervention - Thyroid hormone replacement treatment	Lower cost endocrinology, I
902100		1	02.012	0215	01	Ongoing Rx Tx wo Prov intervention - Testosterone replacement treatment	Lower cost endocrinology, II
902200		1	02.011	0212	02	Ongoing Rx Tx wo Prov intervention - Weight reduction treatment	Lower cost endocrinology, I
902300		1	RX.011	ign		Ongoing Rx Tx wo Prov intervention - Colony stimulating treatment	High cost pharmacy only
902400		1	04.012	0401	08	Ongoing Rx Tx wo Prov intervention - Anxiety/panic disorder treatment	Lower cost psychiatry, II
902500		1	04.012	0401	08	Ongoing Rx Tx wo Prov intervention - Depression treatment	Lower cost psychiatry, II
902600		1	04.012	0401	08	Ongoing Rx Tx wo Prov intervention - Mania/affective disorder treatment	Lower cost psychiatry, II
902700		1	04.021	0401	07	Ongoing Rx Tx wo Prov intervention - Psychosis/schizophrenia treatment	Other moderate cost psychiatry
902800		1	06.032	ign		Ongoing Rx Tx wo Prov intervention - Anticonvulsant treatment	Other moderate cost neurology, II
902900		1	06.032	0601	05	Ongoing Rx Tx wo Prov intervention - Alzheimer's disease treatment	Other moderate cost neurology, II
903000		1	06.021	0605	02	Ongoing Rx Tx wo Prov intervention - Migraine treatment	Migraine headache, w/o significant complication/comorbidity
903100		1	06.061	0601	04	Ongoing Rx Tx wo Prov intervention - Multiple sclerosis/ALS treatment	Multiple sclerosis & ALS, I
903200		1	06.032	0601	05	Ongoing Rx Tx wo Prov intervention - Parkinson's syndrome treatment	Other moderate cost neurology, II
903300		1	07.031	ign		Ongoing Rx Tx wo Prov intervention - Glaucoma treatment	Glaucoma
903400		1	08.021	ign		Ongoing Rx Tx wo Prov intervention - Anticoagulant treatment	Other moderate cost cardiology, I
903500		1	08.012	ign		Ongoing Rx Tx wo Prov intervention - Antiplatelet treatment	Lower cost cardiology, II
903600		1	08.021	0804	01	Ongoing Rx Tx wo Prov intervention - Antiarrhythmic treatment	Other moderate cost cardiology, I
903700		1	08.012	0801	19	Ongoing Rx Tx wo Prov intervention - Hypertension/heart disease treatment	Lower cost cardiology, II
903900		1	09.011	0903	03	Ongoing Rx Tx wo Prov intervention - Sinusitis/rhinitis treatment	Lower cost ear/nose/throat, I
904000		1	10.041	1005	07	Ongoing Rx Tx wo Prov intervention - Asthma treatment	Asthma, chronic obstructive pulmonary disease, I
904100		1	10.041	1005	07	Ongoing Rx Tx wo Prov intervention - Bronchodilator treatment	Asthma, chronic obstructive pulmonary disease, I
904200		1	10.042	1005	03	Ongoing Rx Tx wo Prov intervention - Emphysema/COPD treatment	Asthma, chronic obstructive pulmonary disease, II
904300		1	11.021	1108	03	Ongoing Rx Tx wo Prov intervention - Inflammatory bowel disease treatment	Other moderate cost gastroenterology, I
904400		1	11.013	1112	01	Ongoing Rx Tx wo Prov intervention - Irritable bowel disease treatment	Lower cost gastroenterology, III
904500		1	11.013	1105	03	Ongoing Rx Tx wo Prov intervention - Acid peptic disease treatment	Lower cost gastroenterology, III
904600		1	14.012	1401	05	Ongoing Rx Tx wo Prov intervention - Benign prostatic hypertrophy treatment	Lower cost urology, II
904700		1	14.012	ign		Ongoing Rx Tx wo Prov intervention - Incontinence treatment	Lower cost urology, II
901000		1	01.051	0101	11	Ongoing Rx Tx wo Prov intervention - Non-HIV antiviral treatment	Viral diseases
901100		1	01.042	0101	04	Ongoing Rx Tx wo Prov intervention - HIV/AIDS antiviral treatment	AIDS/HIV, II
901200		1	01.034	0101	07	Ongoing Rx Tx wo Prov intervention - Leprosy treatment	Non-HIV major infectious diseases, IV
901300		1	02.021	0202	97	Ongoing Rx Tx wo Prov intervention - Diabetes mellitus treatment	Diabetes, w/o significant complication/comorbidity
901400		1	02.011	ign		Ongoing Rx Tx wo Prov intervention - Hyperuricemia/gout treatment	Lower cost endocrinology, I
901500		1	02.011	0215	03	Ongoing Rx Tx wo Prov intervention - Impotence treatment	Lower cost endocrinology, I
901600		1	02.031	0209	02	Ongoing Rx Tx wo Prov intervention - Antihyperlipidemic treatment	Hyperlipidemia, excluding lipidoses
901700		1	02.012	0211	03	Ongoing Rx Tx wo Prov intervention - Nutritional treatment	Lower cost endocrinology, II
901800		1	02.012	0203	03	Ongoing Rx Tx wo Prov intervention - Pancreatic enzyme replacement treatment	Lower cost endocrinology, II
901900		1	RX.011	ign		Ongoing Rx Tx wo Prov intervention - Respiratory enzyme deficiency treatment	High cost pharmacy only
902000		1	02.011	0201	03	Ongoing Rx Tx wo Prov intervention - Thyroid hormone replacement treatment	Lower cost endocrinology, I
902100		1	02.012	0215	01	Ongoing Rx Tx wo Prov intervention - Testosterone replacement treatment	Lower cost endocrinology, II
902200		1	02.011	0212	02	Ongoing Rx Tx wo Prov intervention - Weight reduction treatment	Lower cost endocrinology, I
902300		1	RX.011	ign		Ongoing Rx Tx wo Prov intervention - Colony stimulating treatment	High cost pharmacy only
902400		1	04.012	0401	08	Ongoing Rx Tx wo Prov intervention - Anxiety/panic disorder treatment	Lower cost psychiatry, II
902500		1	04.012	0401	08	Ongoing Rx Tx wo Prov intervention - Depression treatment	Lower cost psychiatry, II
902600		1	04.012	0401	08	Ongoing Rx Tx wo Prov intervention - Mania/affective disorder treatment	Lower cost psychiatry, II
902700		1	04.021	0401	07	Ongoing Rx Tx wo Prov intervention - Psychosis/schizophrenia treatment	Other moderate cost psychiatry
902800		1	06.032	ign		Ongoing Rx Tx wo Prov intervention - Anticonvulsant treatment	Other moderate cost neurology, II
902900		1	06.032	0601	05	Ongoing Rx Tx wo Prov intervention - Alzheimer's disease treatment	Other moderate cost neurology, II

ETG	Treatment	Severity	ERG	hierarchy	priority	ETG Base 'Description	ERG Description
903000		1	06.021	0605	02	Ongoing Rx Tx wo Prov intervention - Migraine treatment	Migraine headache, w/o significant complication/comorbidity
903100		1	06.061	0601	04	Ongoing Rx Tx wo Prov intervention - Multiple sclerosis/ALS treatment	Multiple sclerosis & ALS, I
903200		1	06.032	0601	05	Ongoing Rx Tx wo Prov intervention - Parkinson's syndrome treatment	Other moderate cost neurology, II
903300		1	07.031	ign		Ongoing Rx Tx wo Prov intervention - Glaucoma treatment	Glaucoma
903400		1	08.021	ign		Ongoing Rx Tx wo Prov intervention - Anticoagulant treatment	Other moderate cost cardiology, I
903500		1	08.012	ign		Ongoing Rx Tx wo Prov intervention - Antiplatelet treatment	Lower cost cardiology, II
903600		1	08.021	0804	01	Ongoing Rx Tx wo Prov intervention - Antiarrhythmic treatment	Other moderate cost cardiology, I
903700		1	08.012	0801	19	Ongoing Rx Tx wo Prov intervention - Hypertension/heart disease treatment	Lower cost cardiology, II
903900		1	09.011	0903	03	Ongoing Rx Tx wo Prov intervention - Sinusitis/rhinitis treatment	Lower cost ear/nose/throat, I
904000		1	10.041	1005	07	Ongoing Rx Tx wo Prov intervention - Asthma treatment	Asthma, chronic obstructive pulmonary disease, I
904100		1	10.041	1005	07	Ongoing Rx Tx wo Prov intervention - Bronchodilator treatment	Asthma, chronic obstructive pulmonary disease, I
904200		1	10.042	1005	03	Ongoing Rx Tx wo Prov intervention - Emphysema/COPD treatment	Asthma, chronic obstructive pulmonary disease, II
904300		1	11.021	1108	03	Ongoing Rx Tx wo Prov intervention - Inflammatory bowel disease treatment	Other moderate cost gastroenterology, I
904400		1	11.013	1112	01	Ongoing Rx Tx wo Prov intervention - Irritable bowel disease treatment	Lower cost gastroenterology, III
904500		1	11.013	1105	03	Ongoing Rx Tx wo Prov intervention - Acid peptic disease treatment	Lower cost gastroenterology, III
904600		1	14.012	1401	05	Ongoing Rx Tx wo Prov intervention - Benign prostatic hypertrophy treatment	Lower cost urology, II
904700		1	14.012	ign		Ongoing Rx Tx wo Prov intervention - Incontinence treatment	Lower cost urology, II

NQF Resource Use Measure submission

For question S5- Data Dictionary/Code Tables

The content contained in this document is proprietary and confidential

Measure Non-Condition Specific (Population)

This table describes the the ERG Risk Categories. Please also refer the general overview of ETG and ERG referenced in S2.

RISK_CAT	RISK_CAT_DESC	RISKCAT_LV2	RISKCAT_LV2_DESC
0	0.00 - 0.0085	1	0.00 - 0.47
1	0.0085 - 0.0695	1	0.00 - 0.47
2	0.0695 - 0.13	1	0.00 - 0.47
3	0.13 - 0.188	1	0.00 - 0.47
4	0.188 - 0.251	1	0.00 - 0.47
5	0.251 - 0.313	1	0.00 - 0.47
6	0.313 - 0.376	1	0.00 - 0.47
7	0.376 - 0.47	1	0.00 - 0.47
8	0.47 - 0.627	2	0.47 - 0.94
9	0.627 - 0.783	2	0.47 - 0.94
10	0.783 - 0.94	2	0.47 - 0.94
11	0.94 - 1.097	3	0.94 - 1.88
12	1.097 - 1.253	3	0.94 - 1.88
13	1.253 - 1.567	3	0.94 - 1.88
14	1.567 - 1.88	3	0.94 - 1.88
15	1.88 - 2.507	4	1.88 - 3.76
16	2.507 - 3.1325	4	1.88 - 3.76
17	3.1325 - 3.76	4	1.88 - 3.76
18	3.76 - 4.70	5	3.76 - 9.40
19	4.70 - 6.27	5	3.76 - 9.40
20	6.27 - 9.40	5	3.76 - 9.40
21	9.40 - 12.53	6	> 9.40
22	12.53 - 18.80	6	> 9.40
23	18.80 - 25.10	6	> 9.40
24	25.10 - 31.33	6	> 9.40
25	> 31.33	6	> 9.40

NQF Resource Use Measure submission **MEDICAL CLAIM DATA ELEMENTS**
For question S6 - Answer: Ingenix Data Protocol

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

NQF Resource Use Measure submission **RA CLAIM DATA ELEMENTS**

For question S6 - Answer: Ingenix Data Protocol

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
Payment Date	date	10	
NDC Code	alphanum	11	
Prescribing Provider ID	alphanum	20	May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

NQF Resource Use Measure submission **MEMBER DATA ELEMENTS**
For question S6 - Answer: Ingenix Data Protocol
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Sex	alphanum	1	
Date of Birth	date	10	
Effective Date	date	10	Eligibility Begin Date
End Date	date	10	Eligibility End Date
Member Zip Code	alphanum	10	Supports geographic-based member analysis. May be omitted if not available or applicable.
Member State Code	alphanum	2	Supports geographic-based member analysis. May be omitted if not available or applicable.
Pharmacy Benefit Flag	alphanum	1	
PCP ID	alphanum	20	Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Product/Coverage Code Identifier	alphanum	30	Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

NQF Resource Use Measure submission **PROVIDER DATA ELEMENTS**
For question S6 - Answer: Ingenix Data Protocol
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
PCP Indicator	numeric	1	Indicates whether or not the Provider can serve as a PCP
Provider Zip Code	alphanum	10	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider State Code	alphanum	2	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider Affiliation	alphanum	30	Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

NQF Resource Use Measure submission **MEDICAL CLAIM DATA ELEMENTS**
For question S7.2 - Answer: Ingenix Data Source Reference
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
From/Admission Date	date	10	First Date of Service for inpatient records
To/Discharge Date	date	10	Last Date of Service for inpatient records
Payment Date	date	10	
ICD9 Diagnosis Code 1	alphanum	6	
ICD9 Diagnosis Code 2	alphanum	6	
ICD9 Diagnosis Code 3	alphanum	6	
ICD9 Diagnosis Code 4	alphanum	6	
ICD9 Diagnosis Code 5	alphanum	6	
ICD9 Procedure Code 1	alphanum	6	
ICD9 Procedure Code 2	alphanum	6	
ICD9 Procedure Code 3	alphanum	6	
ICD9 Procedure Code 4	alphanum	6	
ICD9 Procedure Code 5	alphanum	6	
ICD9 Procedure Code 6	alphanum	6	
Procedure Code	alphanum	15	CPT or HCPC Procedure Code
Revenue Code	alphanum	15	NUBC Revenue Code
Procedure Code Modifier	alphanum	4	CPT or HCPC Procedure Code Modifier
DRG Code	alphanum	4	Include map/crosswalk table
DRG Version	alphanum	3	Used to identify the DRG Grouper used for the claim (e.g., AP, APR, APS, CMS, MS)
Place of Service Code	alphanum	3	Include map/crosswalk table
Quantity	numeric	4	
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Service Category specific to the claim. Include map/crosswalk table.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

NQF Resource Use Measure submission **RX CLAIM DATA ELEMENTS**

For question S7.2 - Answer: Ingenix Data Source Reference

Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Date of Service	date	10	
Payment Date	date	10	
NDC Code	alphanum	11	
Prescribing Provider ID	alphanum	20	May be omitted if not available. DEA number may also be provided if able to link to the Provider ID.
Allowed Amount	numeric	10.2	Includes capitation and patient liability amounts
Requested/Billed Amount	numeric	10.2	
Payment Amount	numeric	10.2	Includes withhold amounts

NQF Resource Use Measure submission **MEMBER DATA ELEMENTS**
For question S7.2 - Answer: Ingenix Data Source Reference
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Member ID	alphanum	32	Unique Member Identifier
Sex	alphanum	1	
Date of Birth	date	10	
Effective Date	date	10	Eligibility Begin Date
End Date	date	10	Eligibility End Date
Member Zip Code	alphanum	10	Supports geographic-based member analysis. May be omitted if not available or applicable.
Member State Code	alphanum	2	Supports geographic-based member analysis. May be omitted if not available or applicable.
Pharmacy Benefit Flag	alphanum	1	
PCP ID	alphanum	20	Unique Provider Identifier of the Member's Primary Care Provider (if assigned)
Product/Coverage Code Identifier	alphanum	30	Supports product-based (e.g., Commercial, Medicare, Medicaid, HMO, PPO, etc) analysis. May be omitted if not available or applicable.

NQF Resource Use Measure submission **PROVIDER DATA ELEMENTS**
For question S7.2 - Answer: Ingenix Data Source Reference
The content contained in this document is proprietary and confidential
Measure: Cycle 1 Condition Submission for: Diabetes, CHF, AMI, Stroke, CAD, Non-Condition Specific/Population

Data Element Name	Field Type	Maximum Length	Data Element Comments
Provider ID	alphanum	20	Unique Provider Identifier
Provider Specialty	alphanum	30	Provider's Primary Specialty - used for Peer Group assignment. Include map/crosswalk table.
PCP Indicator	numeric	1	Indicates whether or not the Provider can serve as a PCP
Provider Zip Code	alphanum	10	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider State Code	alphanum	2	Supports geographic-based provider analysis. May be omitted if not available or applicable.
Provider Affiliation	alphanum	30	Provider's Affiliation/Group Practice - used to support Affiliation/Group Practice Peer Groups. May be omitted if not available or applicable.

NQF Resource Use Measure submission **ERG ENROLLMENT PERIODS**

For question S8_Clinical Logic

The content contained in this document is proprietary and confidential

Measure Non-Condition Specific (Population)

A member's length of enrollment may affect the number and mix of episodes of care observed. This will ultimately affect the ERG risk markers assigned and risk scores generated by the ERG models. Partial enrollment reflects the number of days a member was enrolled during the experience period and a risk weight assignment for the ERG array is based on that length of time. All ERG models utilize partial enrollment to determine the weights used in computing risk.

With this approach, ERG will apply 1 of 4 separate sets of risk weights that correspond with the member's length of enrollment during the 12-month experience period. The enrollment periods are categorized as follows:

Enrollment Period	Days
1-3 months	1-91
4-6 months	92-183
7-9 months	184-274
10-12 months	275-365/366

NQF Resource Use Measure submission

For question S10_Risk Adjustment Method Example

The content contained in this document is proprietary and confidential

Measure Non-Condition Specific (Population)

Internal Medicine, Medical Group A				
ERG Risk Level	**Number of Member Months**	**Observed Cost PMPM**	**Peers Cost PMPM**	**Relative Cost of Care Ratio**
Dr Smith	**By Risk Level**			
Risk Level 1	65	$30	$35	0.85
Risk Level 2	60	$45	$50	0.90
Risk Level 3	48	$75	$68	1.10
Risk Level 5	54	$110	$85	1.30
Risk Level 9	35	$160	$200	0.80
Risk Level 12	48	$400	$250	1.60
Risk Level 15	24	$1,500	$1,071	1.40
Risk Level 26	22	$3,000	$2,727	1.10
Dr Jones	**By Risk Level**			
Risk Level 1	55	$30	$35	0.85
Risk Level 2	60	$30	$50	0.60
Risk Level 4	57	$64	$65	0.98
Risk Level 5	40	$94	$85	1.10
Risk Level 9	25	$190	$200	0.95
Risk Level 13	60	$280	$350	0.80
Risk Level 15	25	$1,071	$1,071	1.00
Risk Level 20	24	$1,800	$2,000	0.90
Risk Level 26	12	$2,727	$2,727	1.00
Dr Smith	**Overall**			
CHF	356	396	331	1.20
Dr Jones	**Overall**			
CHF	358	377	407	0.93

NQF Resource Use Measure submission **RESULTS ACROSS PEER GROUP/COSTS**

For question SA Reliability & Validity Testing

The content contained in this document is proprietary and confidential

Measure Non-Condition Specific (Population)

	PCP Family Medicine Peer Definition		
	Pharmacy Qualified Status		
	No	Yes	Total
Total Member Months	895,679	8,876,255	9,771,934
Total PMPM	$ 135	$ 196	$ 190
Primary Care Core PMPM	$ 15	$ 16	$ 16
Specialist PMPM	$ 58	$ 57	$ 57
ER PMPM	$ 5	$ 7	$ 7
Radiology PMPM	$ 15	$ 15	$ 15
Pharmacy PMPM	$ 0	$ 53	$ 48
Lab PMPM	$ 9	$ 8	$ 9
Hospital PMPM	$ 32	$ 39	$ 39

	PCP Internal Medicine Peer Definition		
	Pharmacy Qualified Status		
	No	Yes	Total
Total Member Months	897,826	9,370,353	10,268,179
Total PMPM	$ 133	$ 158	$ 156
Primary Care Core PMPM	$ 11	$ 10	$ 10
Specialist PMPM	$ 58	$ 48	$ 49
ER PMPM	$ 5	$ 5	$ 5
Radiology PMPM	$ 15	$ 12	$ 12
Pharmacy PMPM	$ 0	$ 47	$ 43
Lab PMPM	$ 9	$ 7	$ 7
Hospital PMPM	$ 36	$ 29	$ 29

	PCP Pediatrics Peer Definition		
	Pharmacy Qualified Status		
	No	Yes	Total
Total Member Months	559,987	5,786,238	6,346,225
Total PMPM	$ 56	$ 83	$ 80
Primary Care Core PMPM	$ 13	$ 15	$ 15
Specialist PMPM	$ 23	$ 28	$ 28
ER PMPM	$ 5	$ 5	$ 5
Radiology PMPM	$ 3	$ 3	$ 3
Pharmacy PMPM	$ 0	$ 17	$ 15
Lab PMPM	$ 2	$ 2	$ 2
Hospital PMPM	$ 10	$ 12	$ 12

NQF Resource Use Measure submission **RESULTS ACROSS PEER GROUPS/UTILS**

For question SA Reliability & Validity Testing

Measure Non-Condition Specific (Population)

	PCP Family Medicine Peer Definition		
	Pharmacy Qualified Status		
	No	Yes	Total
Total Member Months	895,679	8,876,255	9,771,934
PCP Visits per 1000 Members	142	149	148
Referral Visits per 1000 Members	130	116	118
Referral Encounters per 1000 Members	83	74	75
Radiology Encounters per 1000 Members	65	62	63
Lab Encounters per 1000 Members	133	125	126
MRI Encounters per 1000 Members	5	5	5
ER Visits per 1000 Members	10	13	13
Inpatient Days per 1000 Members	6	9	8
Admissions per 1000 Members	2	3	2
Prescriptions per 1000 Members	3	807	733
Generic Prescriptions per 1000 Members	2	538	489

	PCP Internal Medicine Peer Definition		
	Pharmacy Qualified Status		
	No	Yes	Total
Total Member Months	897,826	9,370,353	10,268,179
PCP Visits per 1000 Members	107	95	96
Referral Visits per 1000 Members	135	108	111
Referral Encounters per 1000 Members	81	67	68
Radiology Encounters per 1000 Members	61	51	52
Lab Encounters per 1000 Members	111	93	94
MRI Encounters per 1000 Members	4	4	4
ER Visits per 1000 Members	9	9	9
Inpatient Days per 1000 Members	7	7	7
Admissions per 1000 Members	2	2	2
Prescriptions per 1000 Members	2	642	586
Generic Prescriptions per 1000 Members	1	402	367

	PCP Pediatrics Peer Definition		
	Pharmacy Qualified Status		
	No	Yes	Total
Total Member Months	559,987	5,786,238	6,346,225
PCP Visits per 1000 Members	158	176	174
Referral Visits per 1000 Members	48	53	52
Referral Encounters per 1000 Members	34	36	36
Radiology Encounters per 1000 Members	18	20	20
Lab Encounters per 1000 Members	58	65	64
MRI Encounters per 1000 Members	1	1	1

ER Visits per 1000 Members	11	12	12
Inpatient Days per 1000 Members	2	2	2
Admissions per 1000 Members	1	1	1
Prescriptions per 1000 Members	1	228	208
Generic Prescriptions per 1000 Members	0	145	132

A Physician Profile
Presented by Ingenix Impact Intelligence

PCP Patterns of Care

For the 12 Months
Ending 12/31/2007

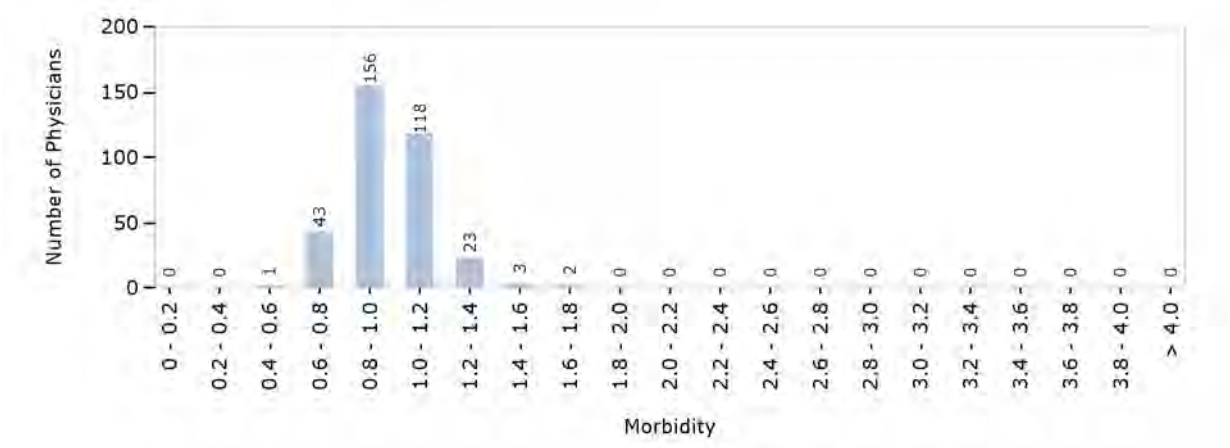
Physician		Number of Members:	390
Name:	Provider 8626541401	Member Months:	4,230
Secondary ID:	433362153	Member Panel Morbidity Index:	0.82
Primary ID:	8626541401	Peer Group	
		Peer Group Member Months:	748,775
Specialty:	Family Medicine	Peer Group Name:	II PCP (Family)
		Key Statistics	
		Overall Quality Index:	0.86
		Overall Cost Index, Population:	0.97
		Confidence Intervals for the Index	
		Overall Quality Index:	No data available
		Overall Cost Index, Population:	No data available

Statistical significance of difference between index and peer group average: * p<0.10; ** p < 0.05

Member Panel Analysis

	Female			Male			Total		
Age Group	PCP #	PCP %	Peers %	PCP #	PCP %	Peers %	PCP #	PCP %	Peers %
00-17	588	13.9%	8.6%	580	13.7%	8.7%	1,168	27.6%	17.4%
18-30	570	13.5%	10.8%	335	7.9%	7.4%	905	21.4%	18.2%
31-44	673	15.9%	17.8%	424	10.0%	14.9%	1,097	25.9%	32.7%
45-64	556	13.1%	16.0%	475	11.2%	14.2%	1,031	24.4%	30.2%
65-74	18	0.4%	0.5%	11	0.3%	0.7%	29	0.7%	1.2%
75+	0	0.0%	0.2%	0	0.0%	0.1%	0	0.0%	0.3%
Total	2,405	56.9%	53.9%	1,825	43.1%	46.1%	4,230	100.0%	100.0%

Relative Morbidity Histogram



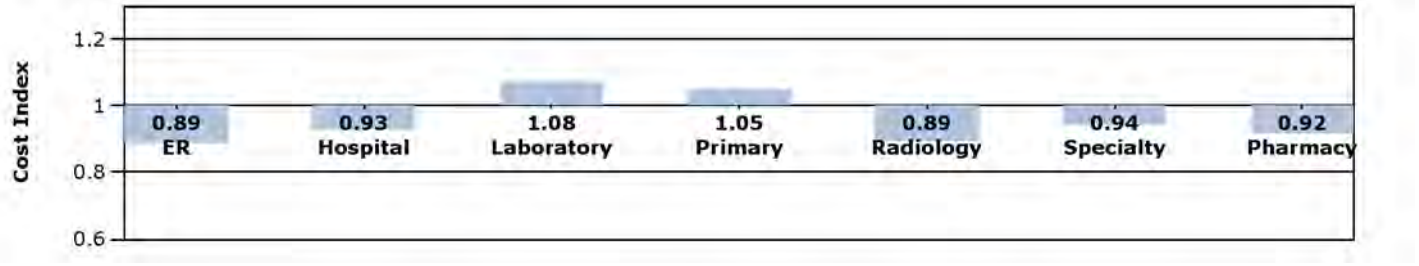
Quality Measures

As of the End of the Report Period
(Members Must be Continuously Enrolled with Plan a Minimum of 12 Months)

	Number of Quality Opportunities		Rates		Index
	With Compliance	Total	Provider Rate	Peer Rate	Quality Index
Cardiology					
HTN					
Pt(s) taking an ACE-inhibitor, angiotensin II receptor antagonist, diuretic, or aldosterone receptor blocker that had a serum K+ in last 12 rpt mos.	4	6	0.67	0.85	0.79
HTN					
Pt(s) taking an NSAID med.	16	18	0.89	0.92	0.96
HTN					
Pt(s) that had an annual physician visit.	18	18	1.00	0.98	1.02
HTN					
Pt(s) that had a serum creatinine in last 12 rpt mos.	9	18	0.50	0.82	0.61
Endocrinology					
Hyperlipidemia					
Pt(s) taking a statin-containing med, nicotinic acid or fibric acid derivative that had an annual serum ALT or AST test.	5	6	0.83	0.93	0.90
Hyperlipidemia					
Pt(s) w/ a LDL cholesterol test in last 12 rpt mos.	5	7	0.71	0.93	0.77
Hyperlipidemia					
Pt(s) w/ a HDL cholesterol test in last 12 rpt mos.	5	7	0.71	0.93	0.77
Hyperlipidemia					
Pt(s) w/ a triglyceride test in last 12 rpt mos.	5	7	0.71	0.93	0.77
Neurology					
Migraine					
Pt(s) w/ frequent use of acute meds.	4	4	1.00	0.95	1.05
Migraine					
Adult pt(s) w/ a CT or MRI study of the head that was not medically ind.	4	4	1.00	0.83	1.21
Migraine					
Adult pt(s) w/ an EEG that was not medically ind.	4	4	1.00	0.98	1.02
Migraine					
Pt(s) that received meperidine for management of a migraine.	4	4	1.00	0.99	1.01
Otolaryngology					
Pharyngitis (NS)					
Pt(s) treated w/ an abx for pharyngitis that had a Group A streptococcus test.	1	4	0.25	0.52	0.48
Sinusitis, Acute					
Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.	4	24	0.17	0.57	0.29
Sinusitis, Acute					
Pt(s) that had a sinus radiographic test.	63	63	1.00	0.98	1.02
Sinusitis, Acute					
Pt(s) that had a sinus CT or MRI test.	63	63	1.00	0.99	1.01
Preventive and Administrative					
Breast CA Scrn (NS)					

Pt(s) 42 - 69 yrs of age that had a screening mammogram in last 24 rpt mos.	23	46	0.50	0.68	0.74
Total	237	303	0.78	0.88	0.89

Cost Index Summary, by Service Category



Cost and Utilization Summary Measures

Profiled Costs

	PMPM			Total
	PCP Actual	PCP Peers	PCP Index	PCP Actual
ER	$8.28	$9.32	0.89	$35,019
Facility	$6.78	$7.78		$28,694
Professional	$1.50	$1.54		$6,325
Hospital Services	$33.47	$36.03	0.93	$141,592
Inpatient Facility	$13.34	$11.19		$56,421
Other Hospital Outpatient	$4.05	$4.93		$17,150
Laboratory	$7.29	$6.77	1.08	$30,849
Facility	$0.23	$0.65		$964
Professional	$7.06	$6.12		$29,884
Pharmacy	$32.78	$35.81	0.92	$138,657
Anti-Infective Agents	$6.94	$4.78		$29,355
Cardiovascular agents	$2.93	$6.33		$12,378
Diagnostic agents	$0.00	$0.00		$0
Primary Care Core	$17.54	$16.68	1.05	$74,214
PCC Diagnostic	$1.95	$3.05		$8,255
PCC Visits	$15.59	$13.63		$65,959
Radiology	$12.39	$13.86	0.89	$52,421
Facility	$6.43	$7.32		$27,189
Professional	$5.97	$6.54		$25,232
Specialty Care	$44.71	$47.40	0.94	$189,114
Medical Specialty	$14.30	$14.71		$60,468
Surgical Specialty	$12.89	$14.97		$54,530
Total	$156.47	$165.88	0.94	$661,867

Overall Cost Index: 0.97

Utilization Rates Per 1,000 Members

Number of Encounters(Annualized per 1,000 Members)

	Actual	Peers	Index
Primary Care Visit Rate	2,505	2,640	0.95
Specialty Care Referral Rate	1,211	1,013	1.20
Visits per Specialist Referral	1,960	1,639	1.20
Radiology Procedure Rate	704	863	0.82
MRI Procedure Rate	101	57	1.77
Laboratory Procedure Rate	1,575	1,957	0.80
Overall Prescribing Rate	7,949	7,894	1.01
Generic Prescribing %	0%	0%	--
ER Visit Rate	152	156	0.97
Admits per 1000 Members	34	29	1.19
Days per 1000 Members	79	69	1.15
Average Length of Stay	2.33	2.42	0.96

Episode Detail and Analysis

Acute bronchitis

Total Specialty Episode Costs: $17,628

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	95	$185.56	$99.40	$5.20	$0.00	$5.69	$1.98	$70.04	$3.26
Peers		$155.58	$59.57	$12.77	$1.16	$3.73	$5.50	$59.86	$13.00
Index			1.67	0.41	0.00	1.52	0.36	1.17	0.25

Encounters per 1000 Episode

Actual			1,343	563	0	32	74	1,968	16
Peers			1,110	544	29	40	95	1,778	38
Index			1.21	1.04	0.00	0.79	0.77	1.11	0.41

Acute sinusitis

Total Specialty Episode Costs: $15,152

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	71	$213.41	$74.31	$31.54	$0.70	$0.00	$4.38	$95.05	$7.44
Peers		$181.45	$61.45	$20.65	$2.30	$5.36	$6.41	$81.47	$3.79
Index			1.21	1.53	0.30	0.00	0.68	1.17	1.96

Encounters per 1000 Episode

Actual			1,094	972	46	0	99	2,408	14
Peers			1,125	843	61	19	118	1,967	10
Index			0.97	1.15	0.75	0.00	0.84	1.22	1.41

Allergic rhinitis

Total Specialty Episode Costs: $6,934

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	26	$266.71	$52.52	$75.56	$1.41	$53.24	$4.34	$67.72	$11.93
Peers		$231.21	$49.13	$54.69	$4.30	$4.13	$1.66	$114.82	$2.49
Index			1.07	1.38	0.33	12.89	2.62	0.59	4.80

Encounters per 1000 Episode

Actual			740	2,404	115	27	115	1,269	38
Peers			852	1,476	54	11	31	1,897	5
Index			0.87	1.63	2.14	2.54	3.69	0.67	8.22

Asthma

Total Specialty Episode Costs: $10,958

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	24	$456.58	$43.47	$138.65	$0.32	$0.41	$110.87	$101.89	$60.97
Peers		$536.27	$72.72	$99.43	$4.58	$14.00	$65.22	$232.77	$47.55
Index			0.60	1.39	0.07	0.03	1.70	0.44	1.28

Encounters per 1000 Episode

Actual			750	1,764	14	42	188	1,875	83
Peers			1,276	1,681	65	78	148	3,565	72
Index			0.59	1.05	0.21	0.53	1.27	0.53	1.16

Hypertension

Total Specialty Episode Costs: $12,844

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	28	$452.00	$89.49	$35.38	$12.01	$26.72	$0.00	$174.02	$114.38
Peers		$618.19	$131.12	$98.44	$12.03	$44.03	$63.89	$225.65	$43.03
Index			0.68	0.36	1.00	0.61	0.00	0.77	2.66

Encounters per 1000 Episode

Actual			1,512	845	129	35	0	6,053	53
Peers			2,348	1,295	156	108	97	6,469	38
Index			0.64	0.65	0.83	0.33	0.00	0.94	1.38

Otitis media

Total Specialty Episode Costs: $8,070

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	55	$146.73	$88.71	$13.57	$0.58	$5.96	$0.00	$37.92	$0.00
Peers		$145.90	$49.70	$32.68	$1.07	$1.83	$17.74	$34.27	$8.60
Index			1.78	0.42	0.54	3.25	0.00	1.11	0.00

Encounters per 1000 Episode

Actual			1,214	618	36	18	0	964	0
Peers			915	640	32	8	105	919	42
Index			1.33	0.97	1.13	2.34	0.00	1.05	0.00

Tonsillitis, adenoiditis or pharyngitis

Total Specialty Episode Costs: $10,604

Cost per Episode	# of Episodes	Total	Primary Care Core	Specialty Care	Laboratory	Radiology	Hospital	Pharmacy	ER
Actual	88	$120.50	$72.80	$14.98	$2.97	$0.00	$3.39	$26.36	$0.00
Peers		$115.35	$51.46	$13.59	$12.33	$1.19	$5.82	$22.27	$8.69
Index			1.41	1.10	0.24	0.00	0.58	1.18	0.00

Encounters per 1000 Episode

Actual			989	614	205	0	68	784	0
Peers			933	440	516	7	117	734	32
Index			1.06	1.39	0.40	0.00	0.58	1.07	0.00

Member Quality Non-Compliance List

Member ID	Member Name	Date of Birth	Gender	Age	Condition	Case	Rule
3271608088		11/17/1950	M	56	Cardiology	HTN	Pt(s) taking an NSAID med.
9884071582		1/23/1963	F	43	Cardiology	HTN	Pt(s) taking an NSAID med.
0086037493		3/20/1952	F	54	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
1624688823		4/15/1936	F	70	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
2260086379		10/8/1950	F	56	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
3745588713		4/4/1981	F	25	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
3844477326		5/22/1959	F	47	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
5227550014		5/14/1963	M	43	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
7281857555		8/7/1949	M	57	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
8410712721		6/26/1951	M	55	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
9456013351		7/2/1970	M	36	Cardiology	HTN	Pt(s) that had a serum creatinine in last 12 rpt mos.
8410712721		6/26/1951	M	55	Endocrinology	Hyperlipidemia	Pt(s) taking a statin-containing med, nicotinic acid or fibric acid derivative that had an annual serum ALT or AST test.
7281857555		8/7/1949	M	57	Endocrinology	Hyperlipidemia	Pt(s) w/ a LDL cholesterol test in last 12 rpt mos.
8410712721		6/26/1951	M	55	Endocrinology	Hyperlipidemia	Pt(s) w/ a LDL cholesterol test in last 12 rpt mos.
7281857555		8/7/1949	M	57	Endocrinology	Hyperlipidemia	Pt(s) w/ a HDL cholesterol test in last 12 rpt mos.
8410712721		6/26/1951	M	55	Endocrinology	Hyperlipidemia	Pt(s) w/ a HDL cholesterol test in last 12 rpt mos.
7281857555		8/7/1949	M	57	Endocrinology	Hyperlipidemia	Pt(s) w/ a triglyceride test in last 12 rpt mos.
8410712721		6/26/1951	M	55	Endocrinology	Hyperlipidemia	Pt(s) w/ a triglyceride test in last 12 rpt mos.
1837455775		1/6/1989	F	17	Otolaryngology	Pharyngitis (NS)	Pt(s) treated w/ an abx for pharyngitis that had a Group A streptococcus test.
3746153816		12/21/1991	F	15	Otolaryngology	Pharyngitis (NS)	Pt(s) treated w/ an abx for pharyngitis that had a Group A streptococcus test.
4069133482		5/30/1989	F	17	Otolaryngology	Pharyngitis (NS)	Pt(s) treated w/ an abx for pharyngitis that had a Group A streptococcus test.

1336806808		9/8/1989	F	17	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
1436401480		10/9/1964	F	42	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
1546105436		2/18/1959	M	47	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
2764823405		10/15/1988	F	18	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3043039116		9/17/1993	M	13	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3185421192		2/17/1993	F	13	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3193621837		4/5/1978	F	28	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3398047161		6/24/1971	M	35	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3588951399		2/13/1969	M	37	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3783497341		7/10/1962	F	44	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3814232514		12/7/1979	F	27	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
3966520016		12/24/1972	M	34	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
4259833676		4/7/1989	M	17	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
4483860253		5/8/1971	F	35	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
7457300534		5/9/1979	F	27	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
7741382982		7/15/1992	F	14	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
8889559767		11/4/1967	F	39	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.
9829462924		3/5/1972	F	34	Otolaryngology	Sinusitis, Acute	Pt(s) treated w/ an abx for acute sinusitis that received a first line abx.

Report Introduction and Interpretation

Patterns of Care

Member Panel

Panel Morbidity - Peer Distribution

Quality

Cost and Use

Episode Detail

Member Quality Non-Compliance

NATIONAL QUALITY FORUM

TO: Consensus Standards Approval Committee (CSAC)

FR: Taroon Amin, Senior Director
Ashlie Wilbon, Senior Project Manager
Evan Williamson, Project Analyst

RE: Clarification on the definition of a national consensus standard

DA: February 21, 2012

CSAC ACTION REQUIRED

The CSAC is asked to provide guidance on the definition of a national consensus standard.

BACKGROUND

During the resource use project, the Steering Committee spent considerable time discussing the appropriate application of cost and resource use measures using actual prices paid, or an approach that allows them to compare the use and intensity of health services while holding actual paid amounts constant (e.g., standardized prices).

Resource use measures that apply standardized prices allow for comparison of resource use units across or within regions and local markets, while actual prices allow for comparison of prices paid only within regions or local markets. The Committee agreed that both approaches could be appropriate for different applications. There was agreement that actual prices paid by health plans to individual clinicians is important to measure and report; for example, regional comparisons at the individual clinician level where environmental factors may not be as prominent. The Committee did, however, express concern over applying an actual price approach for national comparisons, particularly at an individual clinician level. Specifically, the Committee noted the potential for misinterpreting clinician resource use in national reporting. Measures using actual prices do not account for environmental factors (i.e., local facility and wage index) that may be outside of an individual clinician's control.

Throughout their deliberations, it was the Committee's interpretation that the definition of a national consensus standard is to allow fair and equitable comparisons of resource use across all entities regardless of geographic location. While the Committee did not make final recommendations based on a single measure component (i.e. costing approach), the Committee did consider whether valid conclusions about performance on resource use could be made considering a measure's cost approach, level of measurement, risk-adjustment model, clinical logic, and other measure characteristics. In fact, the Committee evaluated each of the measures individually against all of the criteria; a process that resulted in one endorsed measure and three measures pending CSAC vote which use an actual prices paid costing approach.

Measuring using actual prices paid – costing approach
Endorsed January 30, 2012

- (1604) Total Cost of Care Population-based PMPM Index (HealthPartners)

Pending CSAC Vote

- (1609) ETG based hip/knee replacement cost of care measure (Ingenix)
- (1611) ETG based pneumonia cost of care (Ingenix)
- (1595) ETG Based Diabetes Cost of Care (Ingenix) [Split Committee vote]

However, the Committee did express caution when evaluating measures that use actual prices paid costing approach for national comparisons of resource use at the individual clinician level. A measure that uses actual prices paid does not adjust for regional labor costs and practice costs (including hospital wage indexes and geographic practice cost indexes) that may be outside the control of an individual provider. This lack of adjustment raised concerns for many members of the Committee. Measures submitted by HealthPartners and NCQA can be applied down to the physician group level, while measures submitted by Ingenix can be applied down to the individual clinician level. Through this discussion, Committee questioned the definition of a national consensus standard since there are at least two interpretations highlighted in the resource use measures.

CLARIFICATION REQUESTED

The CSAC is asked to provide guidance on two potential definitions of a national consensus standard:

Interpretation 1: A national consensus standard requires a standardized approach that can be used to compare all accountable entities nationally, as well as, at the local/regional level.

If the CSAC agrees that interpretation 1 is correct, then the appropriateness of endorsing measures using actual prices, particularly at the individual clinician level could be questioned. Comparisons at a higher level measurement may be appropriate where the effect of geographic price variation is not as prominent; however, the CSAC should consider the appropriateness of actual prices paid at any level of measurement.

Interpretation 2: A national consensus standard allows for a national standard that can be used to compare accountable entities at only the local/regional level.

If the CSAC agrees that interpretation 2 is correct, additional clarifying information needs to be provided with the endorsement of measures which use actual prices. The following questions require further consideration:

- How is a region/market defined?
- How should these measures be "flagged" when fair comparisons and valid conclusions about performance can only be done at the local/regional level?
- Is it appropriate to endorse an actual price measure for national comparisons if it is paired with a standardized price measure?

The Committee recognized that measures using actual prices paid have been in widespread use by the purchaser and health plan communities for years in various applications. The Committee

is also cognoscente of the implications of these recommendations for measures that could be used for both accountability (i.e. public reporting) and performance improvement purposes for wider audiences. Thus, clarifying the definition of a national consensus standard is important particularly for this application.

NEXT STEPS

The CSAC is asked to consider this issue and provide guidance to the Board of Directors.