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 #: 1584	**NQF Project:** Endorsing Resource Use Standards- Phase II

BRIEF MEASURE INFORMATION
Measure Title: Episode of care for treatment of localized colon cancer
Measure Steward (IP Owner): American Board of Medical Specialties Research and Education Foundation, 222 N. LaSalle St., Suite 1500, Chicago, Illinois, 60601
Brief description of measure: Resource use and costs associated with colon cancer treatment. Patients undergoing colectomy are identified and the resource use and costs associated with colon cancer care in the 30 days before the procedure and the 11 months following the procedure are measured.
Resource use service categories: Inpatient services: Inpatient facility services Inpatient services: Evaluation and management Inpatient services: Procedures and surgeries Inpatient services: Imaging and diagnostic Inpatient services: Lab 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 Durable Medical Equipment (DME)
Brief description of measure clinical logic: Resource use and costs associated with colon cancer treatment. Patients undergoing colectomy are identified and the resource use and costs associated with colon cancer care in the 30 days before the procedure and the 11 months following the procedure are measured.
If included in a composite or paired with another measure, please identify composite or paired measure:
Subject/ Topic Areas: Cancer
Type of resource use measure: Cost/Resource Use
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** **Y☐** **N☐**

A.2. Please check if either of the following apply: **A.3. Measure Steward Agreement.** Agreement signed and submitted **A.4. Measure Steward Agreement attached:** Signed_NQFMeasureSteward Agreement_020309-634387007116740711.pdf	
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:* Quality Improvement (Internal to the specific organization)	**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)** No related measures *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?* No competing measures	**E** **Y☐** **N☐**
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: Attachment: S5_Data Dictionary-634350311712836965.pdf Attachment: Attachment:	

Attachment:
Attachment:
Attachment:
Attachment:
Attachment: 10.1_Risk adjustment method-634350316770649465.pdf
S12_sample score report-634387008193466352.pdf
Attachment: SA_Reliability_Validity Testing Colon Cancer.pdf

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:** A leading cause of morbidity/mortality **IM1.1. Summary of evidence of high impact:** The Institute of Medicine and AQA have identified breast cancer as one of 20 conditions that should be considered priority areas in need of quality improvement based on its relevance to a significant volume of patients, its impact on those patients, and the perception of opportunity to significantly improve the quality and efficiency of related care (1). Colorectal cancer is the third most commonly diagnosed cancer and the third leading cause of cancer death in both men and women in the US (2). In 2010 there were an estimated 102,000 new cases of colon cancer diagnosed in the United States (3). The American Cancer Society estimates that in 2011 there will be 101,700 new cases of colon cancer, and it is expected to cause 49,380 deaths in the U.S. (4). Colon cancer was responsible for the third leading number of new cancer cases in both men and women in 2010. In addition, it was estimated that more than 50,000 individuals died from colon cancer in the United States in 2010. Colon cancer kills men and women with nearly equal frequency. Incidence and death rates for colorectal cancer increase with age. Overall, 91% of new cases and 94% of deaths occur in individuals 50 and older (2). Recent analyses have shown the average total colon cancer attributable healthcare costs for a Medicare patient were just under $30,000 annually (5). Thus, colon cancer is responsible for a large number of cases and a significant economic burden. In a recent study, Mariotto et al. used cancer incidence, survival, and medical cost of care data in the United States to estimate and project the national costs of cancer care through the year 2020. Colorectal was the cancer site with the second highest cost in 2010 at $14.14 billion and is projected to cost $17.41 billion (in 2010 dollars) by the year 2020 (6). olon Cancer Screening There are multiple methods of screening available for the detection of colon cancer including fecal occult blood tests, fecal immunochemical tests, flexible sigmiodoscopy and colonoscopy. The type of screening test used by the American population has varied over the past decade, with colonoscopy is becoming the dominant screening method in the United States. Rates of lower endoscopy in the past 10 years increased from 44.8% in 2002 to 55.7% in 2006 (7). In contrast, the use of fecal occult blood tests decreased from 21.6% to 16.2% in that same period. In the Medicare population, while fecal testing was the dominant screening method in 2005 for enrollees aged 65 years and older, the rate of FOBT use is decreasing and the rate of colonoscopy use is increasing (8). However, despite the evidence supporting the effectiveness of colorectal screening and the availability of various	**1a** **H☐** **M☐** **L☐** **I☐**

screening tests, half of the US population aged 50 and older has not been tested (9).

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

1. Alliance AQ. Candidate list of conditions for cost of care measurement. Available at: http://www.aqaalliance.org/files/CandidateListofConditionsforCostofCare MeasurementApproved.pdf. Accessed April 17, 2011.
2. Colorectal Cancer Facts & Figures 2008-2010. American Cancer Society. www5.cancer.org/downloads/STT/f861708_finalforweb.pdf.
3. American Cancer Society. Cancer Facts & Figures 2010. Atlanta: American Cancer Society; 2010.
4. American Cancer Society, Key Statistics, Colorectal Cancer. www.cancer.org/cancer/colorectalcancer/detaiedguide/html
5. Lou Z, Bradley CJ, Dahman BA, Gardiner JC. Health Care Financ Rev 2009; 31(1): 35-50.
6. Mariotto AB, Yabroff KR, Shao Y et al. Projections of the cost of cancer care in the United States: 2010-2020. J Natl Cancer Inst. 201;103:117-28.
7. Use of colorectal cancer tests—United States, 2002, 2004, and 2006, MMWR Morb Mortal Wkly Rep 57 (2008), pp. 253–258.
8. A.P. Schenck, S.C. Peacock and C.N. Klabunde et al., Trends in colorectal cancer test use in the Medicare population, 1998–2005, Am J Prev Med 37 (2009), pp. 1–7.
9. Shapiro JA, Seeff LC, Thompson TD, Nadel MR, Klabunde CN, Vernon SW. Colorectal cancer test use from the 2005 national health interview survey. Cancer Epidemiol Biomarkers Prev 2008;17(7):1623-30.

IM2. Opportunity for Improvement

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

The intent is that the measure will eventually be paired with quality or patient outcome measures to examine the overall efficiency of care being provided to patients with colon cancer. This will help to identify providers that may be undertaking best care practices through identification of those that provide 'efficient' care by examining both the resource use as well as the quality of care. It will be necessary to put both of these measures together in order to fully realize the potential of resource use measures. However, in the interim this can be used to compare the relative resource use by different providers to examine patterns in colon cancer-related healthcare costs. This may provide actionable information if for example one providers costs are always higher because they provider is using more expensive medications or if the providers patients have more frequent hospitalizations than the patients of comparable providers.

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

--Jansman et al, note the economic implications of colorectal cancer treatment are substantial. The costs of treatment are mainly attributable to the early and terminal stage of the disease (i.e. surgery, hospitalization, chemo- and immunotherapy and supportive care). The introduction of new chemo- and immunotherapeutics has caused a marked and continuing increase of treatment expenditures. Therefore, comparative costs and cost effectiveness are important for assessing the value of new treatment regimens (1)

--Ferro et al conducted a nationwide study of oncology practices demonstrating large variation in the use of modern chemotherapy regimens for colorectal cancer, resulting in dramatic differences in costs. Based on completing a full course of chemotherapy, the authors found the total cost of chemotherapy may differ by as much as $36,999 per patient depending on the regimen (2)

--A review by Meropol and Schulman examined costs of common regimens in the treatment of CRC for 6 months of treatment and noted the wide variation of costs among regimens (3).

--A study by Wong describes marked variations in proximal colon cancer 5-year survival by sex and race/ethnicity. These variations were not explained by age, date of diagnosis, stage of disease, or type of cancer therapy received. Potential explanations include disparities in delivery of health care resources between demographic groups with similar disease characteristics, variations in cancer screening programs, or differences in genetics and cancer biology between each group. (4)

Colon Cancer Screening

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There are multiple methods of screening available for the detection of colon cancer including fecal occult blood tests, fecal immunochemical tests, flexible sigmiodoscopy and colonoscopy. The type of screening test used by the American population has varied over the past decade, with colonoscopy is becoming the dominant screening method in the United States.

Rates of lower endoscopy in the past 10 years increased from 44.8% in 2002 to 55.7% in 2006 (5). In contrast, the use of fecal occult blood tests decreased from 21.6% to 16.2% in that same period. In the Medicare population, while fecal testing was the dominant screening method in 2005 for enrollees aged 65 years and older, the rate of fecal occult blood testing use is decreasing and the rate of colonoscopy use is increasing (6).

Colonoscopy is the preferred colorectal cancer screening strategy of both the American College of Gastroenterology (ACG) and the American Society of Colon and Rectal Surgeons (ASCRS), receiving a Grade 1B recommendation in the ACG's most recent guidelines (issued in 2008)(7). Colon cancer screening is similarly recommended by the US Preventive Services Task Force and has also been identified as a priority area in other national initiatives, including the Health Resources and Services Administration's(HRSA) Health Disparities Collaboratives and the Centers for Medicare and Medicaid Services' (CMS) Quality Improvement Program(8). Although the role of colonoscopy in detecting and preventing colon cancer is clear, concerns have been raised in recent years about the overall rising costs of the procedure. These concerns are in part based on the increasing total volume of colonoscopy procedures performed as well as the increasing costs of each individual procedure. In 2003, for example, 30% of eligible women and 32% of eligible men 50 years and older had undergone the procedure(9,10).The rising costs of each procedure may largely be attributable to increasing costs of ancillary resources that are used. For example, because patient discomfort during the procedure can be considerable, some sort of sedation or anesthesia is typically administered. However, the type of sedation given, whether or not more complete anesthesia should be used, and whether or not sedation is even necessary at all in every circumstance is of some debate. As a result, considerable individual provider discretion is the norm (11). Furthermore, the procedure has some inherently associated potential complications (eg, bleeding and bowel perforation), and the potential for these complications to occur may also vary depending on the level of sedation. Whereas procedures performed with sedation have higher risks of respiratory depression, falls, and other sedation-related complications, those performed without sedation have higher failure rates in part because of patient discomfort (12–14).

IM2.3. Citations for data on variation:

1. Jansman FG, Postma MJ, Brouwers JR. Cost considerations in the treatment of colorectal cancer. Pharmacoeconomics. 2007;25(7):537-562.

2. Myer BS, Wolff DA, Poniewierski MS, et al. Variation in the cost of medications for the treatment of colorectal cancer. Am J Manag Care. 2008;14:717-725.

3. Meropol NJ, Schulman KA. Cost of cancer care: issues and implications. J Clin Oncol. 2007;25:180-186.

4. Wong RJ. Marked Variations in Proximal Colon Cancer Survival by Race/Ethnicity Within the United States. Journal of Clinical Gastroenterology 2010;44:625-630.

5. Use of colorectal cancer tests—United States, 2002, 2004, and 2006, MMWR Morb Mortal Wkly Rep 57 (2008), pp. 253–258.

6. A.P. Schenck, S.C. Peacock and C.N. Klabunde et al., Trends in colorectal cancer test use in the Medicare population, 1998–2005. Am J Prev Med 2009;37:1–7.

7. Rex D, Johnson D, Anderson J, et al. American College of Gastroenterology guidelines for colorectal cancer screening 2009. Am J Gastroenterol 2009;104:139–50.

8. Adams K, Corrigan J, editors. Priority areas for national action: transforming health care quality. Institute of Medicine. Washington, DC: National Academies Press; 2003. p. 117–25.

9. Meissner HI, Breen N, Klabunde CN, et al. Patterns of colorectal cancer screening uptake among men and women in the United States. Cancer Epidemiol Biomarkers Prev 2006;15:389–94.

10. Harewood GC, Lieberman DA. Colonoscopy practice patterns since introduction of Medicare coverage for

average-risk screening. Clin Gastroenterol Hepatol. 2004;2:72–7.

11. Leung FW, Aharonian HS, Guth PH, et al. Unsedated colonoscopy: time to revisit this option? J Fam Pract 2008;57:E1–4.

12. Witt TN, Enns R. The difficult colonoscopy. Can J Gastroenterol 2007;21:487–90.

13. Arrowsmith JB, Gerstman BB, Fleischer DE, et al. Results from the American Society for Gastrointestinal Endoscopy/US Food and Drug Administration collaborative study on complication rates and drug use during gastrointestinal endoscopy. Gastrointest Endosc 1991;37:421–7.

14. Sharma VK, Nguyen C, Crowell MD, et al. A national study of cardiopulmonary unplanned events after GI endoscopy. Gastrointest Endosc 2007;66:27–34.

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

Racial and ethnic minorities, particularly those in impoverished urban communities, have higher colorectal cancer morbidity and mortality rates (1-3). Mortality rates for African Americans are 45% higher than those in whites (4). African Americans are 1.67 times more likely to die within five years after surgical treatment (5). Part of the difference in mortality rates can be attributed to a later stage of disease at presentation due to a lack of screening. This prompted the American College of Gastroenterology to revise its screening recommendations for African Americans to begin screening colonoscopies at age 45 rather than at age 50 (5).

Compared to whites, all other racial/ethnic groups are less likely to be diagnosed with colorectal cancer at the localized stage, when treatment is more successful. More than two-thirds of patients are not diagnosed until the disease has advanced (6). Screening rates for CRC are relatively low in general, but in particular among racial/ethnic minorities (6). Despite the fact that Medicare now covers (since July of 2001) the cost of colonoscopy, fewer than half of the elderly are screened (7), and this is a particular problem among Hispanic elderly (7).

In a study of low-income Latino and white patients in an urban community health center, Green and colleagues (2008) found that for both groups, complicated scheduling processes, financial difficulties and transportation issues, fear of the procedure, pain, or complications, and a cancer diagnosis, embarrassment, and dissuasion from others were barriers to screening. In addition, Latinos in the study experienced language barriers (6). Among females, Hispanic and black women are three times as likely as white women to present with complicated colorectal cancer (8). Culturally appropriate educational materials (9), population-tailored interventions (7), and disparities messages framed in a positive manner (10) have been shown to increase willingness to be screened for colon cancer among racial/ethnic groups.

Stratified analyses showed that blacks as a group generally had poorer survival outcomes for proximal colon cancers (11). Other studies have shown a lower follow-up rate for diagnostic evaluation after screen-detected abnormalities among African Americans compared with whites (12).

Another area of concern is the lack of adherence to chemotherapy guidelines for postoperative care for stage III colon cancer. In the U.S. nearly half of patients with stage III colon cancer do not receive chemotherapy (13). It is not clear whether chemotherapy is not being offered, if patients are not being referred, or whether therapy is being offered but is declined (14). There are also racial/ethnic and socioeconomic disparities in the receipt of chemotherapy (15). Investigators have found that lower SES was significantly associated with decreased survival, even after controlling for race/ethnicity, patient tumor characteristics and definitive treatment (15).
Chemotherapy rates also are disproportionately low for African Americans compared to whites (52.1% vs. 64.1%) even in a Medicare insured population (15). While there are multiple factors that impact the receipt of chemotherapy, referral to a medical oncologist for evaluation is a key factor and area of disparities especially among elderly patients (16). Socioeconomic factors mediate the quality of colon cancer care received in urban areas of the U.S. (17), and high Medicaid hospitals have been shown to have higher postoperative colon cancer mortality rates at 30 days and 1 year (18). Racial/ethic and socioeconomic disparities have been demonstrated in every step of the colon cancer diagnosis and care spectrum. Unequal and inadequate access to care plays a large role (14).

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

1. Jemal A, Clegg LX, Ward E, et al. Annual report to the nation on the status of cancer, 1975–2001, with a

special feature regarding survival. Cancer. 2004;101:3–27.
2. Ball JK, Elixhauser A. Treatment differences between blacks and whites with colorectal cancer. Med Care. 1996;34:970–984.
3. Freeman HP, Alshafie TA. Colorectal carcinoma in poor blacks. Cancer. 2002;94:2327–2332.
4. Colorectal Cancer Facts & Figures 2008-2010. American Cancer Society. www5.cancer.org/downloads/STT/f861708_finalforweb.pdf.
5. Lloyd, S.C., Harvey, N.R., Hebert, J.R., et al., (2007) Racial disparities in colon cancer: Primary care endoscopy as a tool to increase screening rates among minority patients. Cancer, 109(2 Suppl): 378-85.
6. Green, A.R., Peters-Lewis, A., Percac-Lima, S., et al., (2008) Barriers to screening colonoscopy for low-income Latino and white patients in an urban community health center. Journal of General Internal Medicine, 23(6): 834-40.
7. Shih, Y.T., Zhao, L., & Etling, L.S. (2006) Does Medicare coverage of colonoscopy reduce racial/ethnic disparities in cancer screening among the elderly? Health Affairs, 25(4): 1153-62.
8. Bowman, K.C., Tabrizian, P., Telem, D.A., et al., (2010) Health disparity in complicated colorectal cancer. The American Surgeon, 76: 164-67.
9. Walsh, J., Salazar, R., Nguyen, T.T., et al., (2010) Healthy colon, healthy life: A novel colorectal cancer screening intervention. American Journal of Preventive Medicine, 39(1): 1-14.
10. Nicholson, R.A., Kreuter, M.W., Lapka, C., et al., (2008) Unintended effects of emphasizing disparities in cancer communication to African Americans. Cancer Epidemiology Biomarkers and Prevention, 17(11): 2946-2952.
11. Wong, R.J. (2010) Marked variation in proximal colon cancer survival by race/ethnicity within the United States. Journal Clinical Gastroenterology, 44(9): 625-30.
12. Laiyemo, A.O., Boubeni, C., Pinsky, P.F., et al., (2010) Race and colorectal cancer disparities: Health care utilization vs. different cancer susceptibilities. Journal of the National Cancer Institute, 102(8): 538-46.
13. Etzioni, D.A., El-Khoueiry, A.B., & Beart, R.W. (2008) Rates and predictors of chemotherapy use for stage III colon cancer. Cancer, 113(12): 3279-3289.
14. Robinson, C.N., Balentine, C.J., Marhsall, C.L., et al., (2010) Ethnic disparities are reduced in VA colon cancer patients. American Journal of Surgery, 200(5): 636-9.
15. Du, X.L., Fang, S., Vernon, S.W., et al., (2007) Racial disparities and socioeconomic status in association with survival in a large population-based cohort of elderly patients with colon cancer. Cancer, 110(3): 660-668.
16. Davidoff, A.J., Rapp, T., Omukwugha, E., et al., (2009) Trends in disparities in receipt of adjuvant therapy for elderly stage III colon cancer patients. Medical Care, 47(12): 1229-36.
17. Gorey, K.M., Luginaah, I.N., Bartfay, E., et al., (2011) Effects of socioeconomic status on colon cancer treatment accessibility and survival in Toronto, Ontario and San Francisco, California, 1996-2006. American Journal of Public Health, 101(1): 112-19.
18. Rhoads, K.F., Ackerson, L.K., Jha, A.K. et al., (2008) Quality of colon cancer outcomes in hospitals with a higher percentage of Medicaid patients. Journal of the American College of Surgeons, 207: 197-204.

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

There are existing quality measures in colon cancer and it is the intent that this measure complement existing measures by focusing on the resource use during that period. It will ultimately be important to use the results from this measure in combination with quality measures to evaluate the overall efficiency of care for patients with colon cancer. It is quite possible that providers that have higher costs are those that are provided the highest quality care. Therefore it is important to couple these two measurements to get an assessment of the overall efficiency of healthcare provided.

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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?**
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?* Yes http://www.healthqualityalliance.org/hvhc-project/cost-care-measurement-development	**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.* The ABMS REF episode-based resource use measures were created in an open and transparent manner with input from a wide range of clinical experts, methodologists, health care economists and other stakeholders. The measure development process involved a series of deliberate steps where participating clinicians took into account the natural progression of a condition and existing best practices before carefully considering how to best use administrative claims data to construct the episode. They aimed to identify clinically homogenous populations so that the measures would be sensitive to provider decisions and existing practice protocols for like patients. Workgroup members were then asked to conceptualize the measure specifications based on their combined knowledge of guidelines, evidence, and clinical experience. The workgroups helped to define the denominator, duration, clinically relevant services and attribution of each episode as related to the clinical progression and treatment of the condition. Project staff then worked to translate the concepts into detailed written measure specifications and test the measures on a commercial database. The workgroups subsequently re-convened via a series of conference calls to review data analyses, share expert opinions, consider additional evidence-based literature, revise and finalize the measure specifications. Each measure was developed independently and, as such, they are not summative. Attachment:	
S3. Type of resource use measure: Per episode	
S4. Target Population:	
S4.1. Subject/Topic Areas: Cancer	
S4.2. Cross Cutting Areas *(HHS or NPP National health goal/priority)* Care Coordination	
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_Data Dictionary-634350311712836965.pdf

Code Table:

URL:
Please supply the username and password:
Attachment:

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: http://www.healthqualityalliance.org/hvhc-project/cost-care-measurement-development
Please supply the username and password:
Attachment:

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

Guidelines : Approach to Data Cleaning:
If a standardized cleaning methodology or logic for the claims data exists, users are encouraged to apply the existing methodology, or conversely, encouraged not to remove data cleaning steps already implemented. If however, organizations impute missing data, we recommend using only non-imputed data.

Rationale: Each organization will be more familiar with the nature of their data therefore any standard cleaning procedures are likely to be appropriate. Imputation can produce unpredictable biases in the results.

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)

Guidelines : Paid claims with non-missing enrollee identification numbers, primary procedure and diagnosis codes should be included in the measure.
Note: The ABMS REF resource use measures are constructed based on date of service, not date of payment. Therefore, we recommend applying the measures to finalized or "closed" datasets so that complete claims histories during the measurement period are captured in the data.
Including enrollees with at least 24 months of continuous medical and pharmacy benefit enrollment during the identification year and the measurement year is recommended. However, the measure has been tested on enrollees with at least 320 total days of coverage during each year. If precise information regarding persons' total days of coverage is not available, it is recommended that measure implementers estimate this information to the best of their ability using available data elements (e.g., monthly enrollment indicators). This approach is based on the similar eligibility requirements used by NCQA for HEDIS measure denominators.

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)

Guidelines : Beyond the standard data cleaning steps, we recommend that claim lines with missing or zero quantity values be set to a quantity of one and claim lines missing enrollee identification variables, primary diagnosis and procedure codes, and service date be eliminated. We also recommend eliminating all rejected or unpaid claims. Because a single provider id could have multiple specialties, we also recommend generating a uniform specialty for all providers by assigning each provider the specialty which is most frequently observed from all their Evaluation and Management visits.

Rationale: Converting missing or zero quantities to a minimum value of 1 allows for the pricing of these services. Claim lines missing enrollee identifiers, or primary procedure and diagnosis codes cannot be attributed to an individual, and without procedure and diagnosis codes, services cannot be properly identified and categorized. The resource use measures are intended to track costs to the payer, not general or societal costs, so rejected or unpaid claims should be eliminated.
Standardizing the specialty of all providers eliminates the possibility that providers are classified as one specialty for one enrollee and another specialty for others.

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

Guidelines : Users are encouraged to eliminate claim lines missing enrollee identification variables or primary procedure and diagnosis codes. We do not recommend using any imputation methods to replace missing data.

Rationale: Claim lines missing enrollee identifiers cannot be attributed to an individual, and without procedure and diagnosis codes, services cannot be properly identified and categorized. Imputation of missing information could introduce bias into the measure, so we do not recommend the use of imputed data.

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.)

Sources for administrative claims: commercial databases
Standardized price tables: Users can download tables from the NCQA website (see url below) or use the guidelines in the technical appendix of the written measure specification to create their own standardized prices.

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: http://www.ncqa.org/tabid/1092/Default.aspx
Please supply the username and password:
Attachment:

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: http://www.healthqualityalliance.org/hvhc-project/cost-care-measurement-development
Please supply the username and password:
Attachment:

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.

Resource use and costs associated with colon cancer treatment. Patients undergoing colectomy are identified and the resource use and costs associated with colon cancer care in the 30 days before the procedure and the 11 months following the procedure are measured.

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 following steps are used to create the clinical framework for the measure:

Identify the measure population
Step 1: Identify patients that meet episode inclusion criteria
1. Identify patients 18-85 years during the measurement period

Patients will be included in the measure if they have a procedure code present in any field for colonoscopy during the measurement period and an ICD-9 code for colon cancer (see also Tables CCTx-A and CCTx-B) of the written measure specification. These CPT, codes, present in any field, will be used to identify colectomy patients during the measurement period, along with a corresponding ICD-9 code for colon cancer: CPT Codes Colectomy - Open - Partial; With Anastomosis: CPT: 44140; Colectomy - Open - Partial; With Skin Level Cecostomy Or Colostomy: CPT: 44141; Colectomy - Open - Partial; With End Colostomy And Closure Of Distal Segment: CPT: 44143; Colectomy - Open - Partial; With Resection, With Colostomy Or Ileostomy And Mucous Fistula: CPT: 44144; Colectomy - Open - Partial; With Coloproctostomy: CPT: 44145; Colectomy - Open - Partial; With Coloproctostomy And Colostomy: CPT: 44146; Colectomy - Open - Partial; Abdominal And Transanal Approach: CPT: 44147; Colectomy - Open - Total; Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44150; Colectomy - Open - Total; Without Proctectomy, With Continent Ileostomy: CPT: 44151; Colectomy - Open - Total ; Abdominal With Proctectomy, With Ileostomy: CPT: 44155; Colectomy - Open - Total; Abdominal With Continent Ileostomy: CPT: 44156; Colectomy - Open - Total; Abdominal With Ileoanal Anastomosis, Inlcludes Loop Ileostomy: CPT: 44157; Colectomy - Open - Total; With Creation Of Ileal Reservoir, Includes Loop Ileostomy: CPT: 44158; Colectomy - Open - Partial; With Removal Of Terminal Ileum With Ileocecostomy: CPT: 44160; Colectomy - Laparoscopic - Partial; With Anasomosis: CPT: 44204; Colectomy - Laparoscopic - Partial; With Removal Of Terminal Ileum, With Ileocolostomy: CPT: 44205; Colectomy - Laparoscopic - Partial; With End Colostomy And And Closure Of Distal Segment (Hartmann Type Procedure): CPT: 44206; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy: CPT: 44207; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy And Colostomy: CPT: 44208; Colectomy - Laparoscopic - Total; Abdominal Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44210; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, With Ileoanal Anastomosis, Creation Of Ileal Reservoir, Loop Ileostomy: CPT: 44211; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, Ileostomy: CPT: 44212 ICD9 Codes: These diagnosis codes must be present as primary diagnosis on colectomy claim for patients to be included in the episode: Malignant neoplasm of colon: ICD9: 153.x; Carcinoma in situ of colon: ICD9: 230.3.

Step 2: Identify patients that meet eligibility and continuous enrollment criteria
1. Eligibility
a. Identify benefits during both the measurement year and the identification year
b. To be included persons must have both of the following benefits in both years

i. Medical benefit
ii. Pharmacy benefit
(Do not include persons whose pharmacy benefits are dropped partway through the identification or measurement period)

2. Continuous enrollment
a. Determine enrollment during both the identification and measurement years
b. Identify (or estimate) total days of coverage in each year
c. To be eligible, persons must have at least 320 total days of coverage during each year

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Step 3: Identify patients with exclusion criteria
1. Identify patients that meet one or more of the following exclusion criteria during either the identification year OR the measurement year
a. Standard Exclusion Criteria (see alsoTables CCTx-I 1-4 in written measure specification): Cancer: ICD9: 140-152, 154-208, 230.1, 230.2, 230.4, 230.5, 230.6, 230.7, 230.8, 230.9, 231-239;--WITH-- Treatment: CPT: 38230, 38240-38242, 77261-77799, 79000-79999, 96400-96549; ICD9: 41.0, 41.91, 92.2; 028x, 033x, 0342, 0344, 0973; ESRD (including renal dialysis): CPT: 36145, 36800-36821, 36831-36833, 90919-90921, 90923-90925, 90935, 90937, 90939, 90940, 90945, 90947, 90989, 90993, 90997, 90999, 99512; HCPCS: G0257, G0311-G0319, G0321-G0323, G0325-G0327, G0392, G0393, S9339; ICD9 Diagnosis: 585.5, 585.6, V42.0, V45.1, V56; ICD9 Procedure: 38.95, 39.27, 39.42, 39.43, 39.53, 39.93, 39.94, 39.95, 54.98; UB Revenue: 080x, 082x-085x, 088x; UB Type of Bill: 72x; Position: 65; Organ transplant; CPT: 32850-32856, 33930-33945, 44132-44137, 44715-44721, 47133-47147, 48160, 48550-48556, 50300-50380; HCPCS: S2152, S2053-S2055, S2060, S2061, S2065; ICD9 Procedure: 33.5, 33.6, 37.5, 41.94, 46.97, 50.5, 52.8, 55.6; UB Revenue: 0362, 0367, 0810-0813, 0819; HIV: ICD9: 042.

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b. Persons with a prior colectomy within the previous 12 months are excluded (see also Table CCTx-A): CPT Codes Colectomy - Open - Partial; With Anastomosis: CPT: 44140; Colectomy - Open - Partial; With Skin Level Cecostomy Or Colostomy: CPT: 44141; Colectomy - Open - Partial; With End Colostomy And Closure Of Distal Segment: CPT: 44143; Colectomy - Open - Partial; With Resection, With Colostomy Or Ileostomy And Mucous Fistula: CPT: 44144; Colectomy - Open - Partial; With Coloproctostomy: CPT: 44145; Colectomy - Open - Partial; With Coloproctostomy And Colostomy: CPT: 44146; Colectomy - Open - Partial; Abdominal And Transanal Approach: CPT: 44147; Colectomy - Open - Total; Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44150; Colectomy - Open - Total; Without Proctectomy, With Continent Ileostomy: CPT: 44151; Colectomy - Open - Total ; Abdominal With Proctectomy, With Ileostomy: CPT: 44155; Colectomy - Open - Total; Abdominal With Continent Ileostomy: CPT: 44156; Colectomy - Open - Total; Abdominal With Ileoanal Anastomosis, Inlcludes Loop Ileostomy: CPT: 44157; Colectomy - Open - Total; With Creation Of Ileal Reservoir, Includes Loop Ileostomy: CPT: 44158; Colectomy - Open - Partial; With Removal Of Terminal Ileum With Ileocecostomy: CPT: 44160; Colectomy - Laparoscopic - Partial; With Anasomosis: CPT: 44204; Colectomy - Laparoscopic - Partial; With Removal Of Terminal Ileum, With Ileocolostomy: CPT: 44205; Colectomy - Laparoscopic - Partial; With End Colostomy And And Closure Of Distal Segment (Hartmann Type Procedure): CPT: 44206; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy: CPT: 44207; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy And Colostomy: CPT: 44208; Colectomy - Laparoscopic - Total; Abdominal Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44210; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, With Ileoanal Anastomosis, Creation Of Ileal Reservoir, Loop Ileostomy: CPT: 44211; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, Ileostomy: CPT: 44212

Step 4: Combine prior steps to identify measure population
1. Identify stable colon cancer eligible population
2. Exclude those patients not meeting general inclusion criteria (e.g., continuous eligibility)
3. Exclude those patients meeting one or more measure exclusion criteria
4. The resulting collection of patients is the measure population

Identify Eligible Events

For each individual in the measure population, identify the following paid claims for services rendered during the measurement period. Claims / encounters will be identified based on the presence of colon cancer-related diagnosis codes or procedure codes. These events will be used to determine the colon cancer-related resource use.

Inpatient hospitalization events

Identify all inpatient hospitalization events with one of the following diagnosis codes appearing in the primary diagnosis field (see also Table CCTx-C in written measure specification): Malignant neoplasm of colon: ICD9: 153.x; Carcinoma in situ of colon: ICD9: 230.3; Postoperative infection (abscess: intra-abdominal, stitch, wound): ICD9: 998.51, 998.59; Vomiting: ICD9: 787.0, 787.01, 787.03, 787.04; Vomiting following gastrointestinal surgery (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 564.3; Dehydration: ICD9: 276.51; Abdominal pain: ICD9: 789.x; Diarrhea Other and unspecified gastroenteritis and colitis: ICD9: 558.9; Diarrhea Other postoperative functional disorders: ICD9: 564.4; Diarrhea, NOS: ICD9: 787.91; Fever: ICD9: 780.60, 780.61, 780.62; Perforation of intestine (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 569.83; Ileus: ICD9: 560.1, 560.31; Gastrointestinal hemorrhage (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 578; Hematemesis: ICD9: 578.0; Blood in stool: ICD9: 578.1; Hemorrhage of gastrointestinal tract, unspecified: ICD9: 578.9; Disruption of wound, unspecified: ICD9: 998.30; Disruption of internal operation (surgical) wound: ICD9: 998.31; Disruption of external operation (surgical) wound: ICD9: 998.32; Digestive system complication, NEC: ICD9: 997.4; Pressure ulcer, unspecified site: ICD9: 707.00; Pressure ulcer, lower back: ICD9: 707.03; Pressure ulcer, hip: ICD9: 707.04; Pressure ulcer, buttock: ICD9: 707.05; Pressure ulcer, other site: ICD9: 707.09; Cardiopulmonary complications (only included from day t-1 to day t+14, where t is the date of the colectomy event date)-- Myocardial infarction: ICD9: 410.x, except 410.x2; Angina: ICD9: 413.x; Acute coronary syndrome: ICD9: 411.1, 411.8x; Cardiac disrhythmias, arrhythmias: ICD9: 427.xx; Congestive heart failure (CHF): ICD9: 428.xx, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93; Cardiac or respiratory arrest: ICD9: 427.5, 518.81, 518.84, 799.1, 997.1; Syncope: ICD9: 780.2; Hypotension: ICD9: 458.9; Shock: ICD9: 518.5, 785.50, 785.51, 785.59, 998.0; Stroke (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 431.x-438.x; Pulmonary embolism: ICD9: 415.1x; DVT: ICD9: 453.4x; Intestinal infections due to other organisms: ICD9: 008.x; Ill-defined intestinal infections: ICD9: 009.x; Streptococcal sore throat and scarlet fever: ICD9: 0.34x; Septicemia: ICD9: 038.x; Bacterial infection in conditions classified elsewhere and of unspecified site: ICD9: 041.x; Iron deficiency anemia: ICD9: 280.x; Anemia of chronic illness: ICD9: 285.2; Anemia, unspecified: ICD9: 285.9; Agranulocytosis: ICD9: 288.0

or

hospitalizations with an eligible colon cancer code (seeTables CCTx-A, CCTx-B, CCTxH): CPT Codes Colectomy - Open - Partial; With Anastomosis: CPT: 44140; Colectomy - Open - Partial; With Skin Level Cecostomy Or Colostomy: CPT: 44141; Colectomy - Open - Partial; With End Colostomy And Closure Of Distal Segment: CPT: 44143; Colectomy - Open - Partial; With Resection, With Colostomy Or Ileostomy And Mucous Fistula: CPT: 44144; Colectomy - Open - Partial; With Coloproctostomy: CPT: 44145; Colectomy - Open - Partial; With Coloproctostomy And Colostomy: CPT: 44146; Colectomy - Open - Partial; Abdominal And Transanal Approach: CPT: 44147; Colectomy - Open - Total; Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44150; Colectomy - Open - Total; Without Proctectomy, With Continent Ileostomy: CPT: 44151; Colectomy - Open - Total ; Abdominal With Proctectomy, With Ileostomy: CPT: 44155; Colectomy - Open - Total; Abdominal With Continent Ileostomy: CPT: 44156; Colectomy - Open - Total; Abdominal With Ileoanal Anastomosis, Inlcludes Loop Ileostomy: CPT: 44157; Colectomy - Open - Total; With Creation Of Ileal Reservoir, Includes Loop Ileostomy: CPT: 44158; Colectomy - Open - Partial; With Removal Of Terminal Ileum With Ileocecostomy: CPT: 44160; Colectomy - Laparoscopic - Partial; With Anasomosis: CPT: 44204; Colectomy - Laparoscopic - Partial; With Removal Of Terminal Ileum, With Ileocolostomy: CPT: 44205; Colectomy - Laparoscopic - Partial; With End Colostomy And And Closure Of Distal Segment (Hartmann Type Procedure): CPT: 44206; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy: CPT: 44207; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy And Colostomy: CPT: 44208; Colectomy - Laparoscopic - Total; Abdominal Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44210; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, With Ileoanal Anastomosis, Creation Of Ileal Reservoir, Loop Ileostomy: CPT: 44211; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, Ileostomy: CPT: 44212 ICD9 Codes: These diagnosis codes must be present as primary diagnosis on colectomy claim for patients to be included in the episode: Malignant neoplasm of colon: ICD9: 153.x; Carcinoma in situ of colon: ICD9: 230.3; DRGs Rectal resection w CC: DRG v24: 146; MS DRG V25: 332, 333; Rectal resection w/o CC: DRG v24: 147; MS DRGv25: 334; Major small & large bowel procedures w/o CC: DRG v24: 149; MS DRG v25: 331; Major small & large bowel procedures w CC Major GI Dx: DRG v24: 569; MS DRG v25: 329, 330; Major small & large bowel procedures w CC w/o Major GI Dx: DRG v24: 570

Outpatient events

Identify all outpatient claims / encounters with a colon cancer-related diagnostic code appearing in any position (see Tables CCTx-A, CCTx-B, CCTx-C). CPT Codes Colectomy - Open - Partial; With Anastomosis: CPT: 44140; Colectomy - Open - Partial; With Skin Level Cecostomy Or Colostomy: CPT: 44141; Colectomy - Open - Partial; With End Colostomy And Closure Of Distal Segment: CPT: 44143; Colectomy - Open - Partial; With Resection, With Colostomy Or Ileostomy And Mucous Fistula: CPT: 44144; Colectomy - Open - Partial; With Coloproctostomy: CPT: 44145; Colectomy - Open - Partial; With Coloproctostomy And Colostomy: CPT: 44146; Colectomy - Open - Partial; Abdominal And Transanal Approach: CPT: 44147; Colectomy - Open - Total; Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44150; Colectomy - Open - Total; Without Proctectomy, With Continent Ileostomy: CPT: 44151; Colectomy - Open - Total ; Abdominal With Proctectomy, With Ileostomy: CPT: 44155; Colectomy - Open - Total; Abdominal With Continent Ileostomy: CPT: 44156; Colectomy - Open - Total; Abdominal With Ileoanal Anastomosis, Inlcludes Loop Ileostomy: CPT: 44157; Colectomy - Open - Total; With Creation Of Ileal Reservoir, Includes Loop Ileostomy: CPT: 44158; Colectomy - Open - Partial; With Removal Of Terminal Ileum With Ileocecostomy: CPT: 44160; Colectomy - Laparoscopic - Partial; With Anasomosis: CPT: 44204; Colectomy - Laparoscopic - Partial; With Removal Of Terminal Ileum, With Ileocolostomy: CPT: 44205; Colectomy - Laparoscopic - Partial; With End Colostomy And And Closure Of Distal Segment (Hartmann Type Procedure): CPT: 44206; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy: CPT: 44207; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy And Colostomy: CPT: 44208; Colectomy - Laparoscopic - Total; Abdominal Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44210; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, With Ileoanal Anastomosis, Creation Of Ileal Reservoir, Loop Ileostomy: CPT: 44211; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, Ileostomy: CPT: 44212 ICD9 Codes: These diagnosis codes must be present as primary diagnosis on colectomy claim for patients to be included in the episode: Malignant neoplasm of colon: ICD9: 153.x; Carcinoma in situ of colon: ICD9: 230.3 Malignant neoplasm of colon: ICD9: 153.x; Carcinoma in situ of colon: ICD9: 230.3; Postoperative infection (abscess: intra-abdominal, stitch, wound): ICD9: 998.51, 998.59; Vomiting: ICD9: 787.0, 787.01, 787.03, 787.04; Vomiting following gastrointestinal surgery (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 564.3; Dehydration: ICD9: 276.51; Abdominal pain: ICD9: 789.x; Diarrhea Other and unspecified gastroenteritis and colitis: ICD9: 558.9; Diarrhea Other postoperative functional disorders: ICD9: 564.4; Diarrhea, NOS: ICD9: 787.91; Fever: ICD9: 780.60, 780.61, 780.62; Perforation of intestine (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 569.83; Ileus: ICD9: 560.1, 560.31; Gastrointestinal hemorrhage (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 578; Hematemesis: ICD9: 578.0; Blood in stool: ICD9: 578.1; Hemorrhage of gastrointestinal tract, unspecified: ICD9: 578.9; Disruption of wound, unspecified: ICD9: 998.30; Disruption of internal operation (surgical) wound: ICD9: 998.31; Disruption of external operation (surgical) wound: ICD9: 998.32; Digestive system complication, NEC: ICD9: 997.4; Pressure ulcer, unspecified site: ICD9: 707.00; Pressure ulcer, lower back: ICD9: 707.03; Pressure ulcer, hip: ICD9: 707.04; Pressure ulcer, buttock: ICD9: 707.05; Pressure ulcer, other site: ICD9: 707.09; Cardiopulmonary complications (only included from day t-1 to day t+14, where t is the date of the colectomy event date)-- Myocardial infarction: ICD9: 410.x, except 410.x2; Angina: ICD9: 413.x; Acute coronary syndrome: ICD9: 411.1, 411.8x; Cardiac disrhythmias, arrhythmias: ICD9: 427.xx; Congestive heart failure (CHF): ICD9: 428.xx, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93; Cardiac or respiratory arrest: ICD9: 427.5, 518.81, 518.84, 799.1, 997.1; Syncope: ICD9: 780.2; Hypotension: ICD9: 458.9; Shock: ICD9: 518.5, 785.50, 785.51, 785.59, 998.0; Stroke (only included from day t-1 to day t+14, where t is the date of the colectomy event date): ICD9: 431.x-438.x; Pulmonary embolism: ICD9: 415.1x; DVT: ICD9: 453.4x; Intestinal infections due to other organisms: ICD9: 008.x; Ill-defined intestinal infections: ICD9: 009.x; Streptococcal sore throat and scarlet fever: ICD9: 0.34x; Septicemia: ICD9: 038.x; Bacterial infection in conditions classified elsewhere and of unspecified site: ICD9: 041.x; Iron deficiency anemia: ICD9: 280.x; Anemia of chronic illness: ICD9: 285.2; Anemia, unspecified: ICD9: 285.9; Agranulocytosis: ICD9: 288.0

Procedures , laboratory and other services

Identify all claims / encounters with one of the following CPT, HCPCs, or ICD-9 procedure codes (see also Tables CCTx-E and CCTx-G in written measure specification): Colectomy - Open - Partial; With Anastomosis: CPT: 44140; Colectomy - Open - Partial; With Skin Level Cecostomy Or Colostomy: CPT: 44141; Colectomy - Open - Partial; With End Colostomy And Closure Of Distal Segment: CPT: 44143; Colectomy - Open - Partial; With Resection, With Colostomy Or Ileostomy And Mucous Fistula: CPT: 44144; Colectomy - Open - Partial; With Coloproctostomy: CPT: 44145; Colectomy - Open - Partial; With Coloproctostomy And Colostomy: CPT: 44146; Colectomy - Open - Partial; Abdominal And Transanal Approach: CPT: 44147; Colectomy - Open - Total; Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44150; Colectomy - Open - Total; Without Proctectomy, With Continent Ileostomy: CPT: 44151; Colectomy - Open - Total ; Abdominal With Proctectomy, With Ileostomy: CPT: 44155; Colectomy - Open - Total; Abdominal With Continent Ileostomy: CPT: 44156; Colectomy - Open - Total; Abdominal With Ileoanal

Anastomosis, Inlcludes Loop Ileostomy: CPT: 44157; Colectomy - Open - Total; With Creation Of Ileal Reservoir, Includes Loop Ileostomy: CPT: 44158; Colectomy - Open - Partial; With Removal Of Terminal Ileum With Ileocecostomy: CPT: 44160; Colectomy - Laparoscopic - Partial; With Anasomosis: CPT: 44204; Colectomy - Laparoscopic - Partial; With Removal Of Terminal Ileum, With Ileocolostomy: CPT: 44205; Colectomy - Laparoscopic - Partial; With End Colostomy And And Closure Of Distal Segment (Hartmann Type Procedure): CPT: 44206; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy: CPT: 44207; Colectomy - Laparoscopic - Partial; With Anastomosis With Coloproctostomy And Colostomy: CPT: 44208; Colectomy - Laparoscopic - Total; Abdominal Without Proctectomy, With Ileostomy Or Ileoproctostomy: CPT: 44210; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, With Ileoanal Anastomosis, Creation Of Ileal Reservoir, Loop Ileostomy: CPT: 44211; Colectomy - Laparoscopic - Total; Abdominal With Proctectomy, Ileostomy: CPT: 44212; Enterolysis - Open - (Lysis Of Adhesions) - Separate Procedure: CPT: 44005; Tube Or Needle Catheter Jejunostomy - Open - For Enteral Alimentation, Intraoperative, Any Method - Listed Separately: CPT: 44015; Enterectomy - Open - Resection Of Small Intestine, Single Resection And Anastomosis: CPT: 44120; Enterectomy - Open - Resection Of Small Intestine, Each Additional Resection And Anastomosis: CPT: 44121; Enterectomy - Open - Resection Of Small Intestine, With Enterostomy: CPT: 44125; Mobilization Of Splenic Flexure - Open - In Conjunction With With Partial Colectomy - Listed Separately: CPT: 44139; Enterolysis - Laparoscopic - (Lysis Of Adhesions) - Separate Procedure: CPT: 44180; Jejunostomy - Laparoscopic - For Enteral Alimentation, Decompression: CPT: 44186; Ileostomy Or Jejunostomy - Laparoscopic - Non-Tube: CPT: 44187; Colostomy Or Cecostomy – Laparoscopic: CPT: 44188; Enterectomy - Laparoscopic - Resection Of Small Intestine, Single Resection And Anastomosis: CPT: 44202; Enterectomy - Laparoscopic - Resection Of Small Intestine, Each Additional Resection And Anastomosis: CPT: 44203; Mobilization Of Splenic Flexure - Laparoscopic - In Conjunction With Partial Colectomy - Listed Separately: CPT: 44213; Closure Of Enterostomy - Laparoscopic - Large Or Small Intestine, With Resection And Anastomosis: CPT: 44227; Unlisted Procedure - Laparoscopic - Intestine (Except Rectum): CPT: 44238; Enterostomy Or Cecostomy - Open - Tube Placement, For Feeding Or Decompression - Separate Procedure: CPT: 44300; Ileostomy Or Jejunostomy - Open - Non-Tube: CPT: 44310; Ileostomy Revision - Open - Simple - Separate Procedure: CPT: 44312; Ileostomy Revision - Open - Complicated - Separate Procedure: CPT: 44214; Continent Ileostomy - Open - Separate Procedure: CPT: 44316; Colostomy Or Skin Level Cecostomy – Open: CPT: 44320; Colostomy Revision - Open - Simple - Separate Procedure: CPT: 44340; Colostomy Revision - Open - Complicated - Separate Procedure: CPT: 44345; Colostomy Revision - Open - With Repair Of Paracolostomy Hernia - Separate Procedure: CPT: 44346; Colonoscopy - Through Stoma, Diagnostic, With Or Without Collection Of Specimens - Separate Procedure: CPT: 44388; Colonoscopy - Through Stoma, Diagnostic, With Biopsy, Single Or Multiple - Separate Procedure: CPT: 44389; Colonoscopy - Through Stoma, Diagnostic, With Control Of Bleeding: CPT: 44391; Colonoscopy - Through Stoma, Diagnostic, With Removal Of Tumors, Polyps Or Other Lesions: CPT: 44392; Colonoscopy - Through Stoma, Diagnostic, With Ablation Of Lesions Not Amenable To Removal, By Hot Biopsy Forceps: CPT: 44393; Colonoscopy - Through Stoma, Diagnostic, With Ablation Of Lesions Not Amenable To Removal, By Snare Technique: CPT: 44394; Colonoscopy - Through Stoma, Diagnostic, With Transendoscopic Stent Placement: CPT: 44397; Enterorrhaphy - Open - (Suture Of Small Intestine) - For Perforation Or Injury, Single: CPT: 44602; Enterorrhaphy - Open - (Suture Of Small Intestine) - For Perforation Or Injury, Multiple: CPT: 44603; Colorrhaphy - Open - (Suture Of Large Intestine) - For Perforation Or Injury, Single Or Multiple, Without Colostomy: CPT: 44604; Colorrhaphy - Open - (Suture Of Large Intestine) - For Perforation Or Injury, Single Or Multiple, With Colostomy: CPT: 44605; Enterostomy Or Colostomy Closure – Open: CPT: 44620; Enterostomy Or Colostomy Closure - Open - With Resection And Anastomosis Other Than Colorectal: CPT: 44625; Enterostomy Or Colostomy Closure - Open - With Resection And Colorectal Anastomosis: CPT: 44626; Closure Of Intestinal Cutaneous Fistula – Open: CPT: 44640; Closure Of Enteroenteric Or Enterocolic Fistula – Open: CPT: 44650; Closure Of Enterovesicle Fistula - Open - Without Intestinal Or Bladder Resection: CPT: 44660; Closure Of Enterovesicle Fistula - Open - With Intestinal And/Or Bladder Resection: CPT: 44661; Intraoperative Colonic Lavage - Listed Separately: CPT: 44701; Unlisted Procedure, Intestine: CPT: 44799; Proctosigmoidoscopy - Rigid, Diagnostic, With Or Without Collection Of Specimens - Separate Procedure: CPT: 45300; Proctosigmoidoscopy - Rigid, Diagnostic, With Or Without Collection Of Specimens, With Dilatation - Separate Procedure: CPT: 45303; Proctosigmoidoscopy - Rigid, Diagnostic, With Or Without Collection Of Specimens, With Biopsy, Single Or Multiple - Separate Procedure: CPT: 45305; Proctosigmoidoscopy - Rigid, Diagnostic, With Removal Of Single Tumor Or Polyp By Hot Biopsy Forceps - Separate Procedure: CPT: 45308; Proctosigmoidoscopy - Rigid, Diagnostic, With Removal Of Single Tumor Or Polyp By Snare Technique - Separate Procedure: CPT: 45309; Proctosigmoidoscopy - Rigid, Diagnostic, With Removal Of Multiple Tumors Or Polyps By Hot Biopsy Forceps Or Snare Technique - Separate Procedure: CPT: 45315; Proctosigmoidoscopy - Rigid, Diagnostic, With Control Of Bleeding - Separate Procedure: CPT: 45317; Proctosigmoidoscopy - Rigid, Diagnostic, With Ablation Of Tumors Not Amenable To Removal - Separate Procedure: CPT: 45320; Proctosigmoidoscopy - Rigid, Diagnostic, With Transendoscopic Stent Placement: CPT: 45327; Sigmoidoscopy - Flexible, Diagnostic, With Or Without Collection Of Specimens - Separate Procedure: CPT: 45330; Sigmoidoscopy - Flexible, Diagnostic, With Biopsy, Single Or Multiple - Separate Procedure: CPT:

45331; Sigmoidoscopy - Flexible, Diagnostic, With Removal Of Tumors Or Polyps By Hot Biopsy Forceps - Separate Procedure: CPT: 45333; Sigmoidoscopy - Flexible, Diagnostic, With Control Of Bleeding - Separate Procedure: CPT: 45334; Sigmoidoscopy - Flexible, Diagnostic, With Directed Submucosal Injections, Any Substance - Separate Procedure: CPT: 45335; Sigmoidoscopy - Flexible, Diagnostic, With Removal Of Tumors Or Polyps By Snare Technique - Separate Procedure: CPT: 45388; Sigmoidoscopy - Flexible, Diagnostic, With Ablation Of Tumors Not Amenable To Removal - Separate Procedure: CPT: 45339; Sigmoidoscopy - Flexible, Diagnostic, With Dilation By Balloon, One Or More Strictures - Separate Procedure: CPT: 45340; Sigmoidoscopy - Flexible, Diagnostic, With Endoscopic Ultrasound Examination: CPT: 45341; Sigmoidoscopy - Flexible, Diagnostic, With Transendoscopic Ultrasound Guided Intramural Or Transmural Needle Aspiration/Biopsy: CPT: 45342; Sigmoidoscopy - Flexible, Diagnostic, With Transendoscopic Stent Placement: CPT: 45345; Colonoscopy - Rigid Or Flexible, Transabdominal Via Colotomy, Single Or Multiple: CPT: 45355; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Or Without Collection Of Specimens, With Or Without Decompression - Separate Procedure: CPT: 45378; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Biopsy, Single Or Multiple - Separate Procedure: CPT: 45380; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Directed Submucosal Injections, Any Substance - Separate Procedure: CPT: 45381; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Control Of Bleeding - Separate Procedure: CPT: 45382; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Ablation Of Tumors Not Amenable To Removal - Separate Procedure: CPT: 45383; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Removal Of Tumors By Hot Biopsy Forceps - Separate Procedure: CPT: 45384; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Removal Of Tumors By Snare Technique- Separate Procedure: CPT: 45385; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Dilation By Balloon, One Or More Strictures - Separate Procedure: CPT: 45386; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Transendoscopic Stent Placement: CPT: 45387; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Endoscopic Ultrasound Examination: CPT: 45391; Colonoscopy - Flexible, Proximal To Splenic Flexure, Diagnostic, With Transendoscopic Ultrasound Guided Intramural Or Transmural Needle Aspiration/Biopsy: CPT: 45392; Colorectal cancer screening; colonoscopy on individual at high risk: HCPC: G0105; Colorectal cancer screening; alternative to G0105, screening colonoscopy, barium enema: HCPC: G0120; Colorectal cancer screening; colonoscopy on individual not meeting criteria for high risk: HCPC: G0121; Colonoscopy: ICD9: 45.23; Endoscopic polypectomy of large intestine: ICD9: 45.42; Ostomy faceplate each: HCPC: A4361; Skin barrier; solid 4 x 4 or equivalent; each: HCPC: A4362; Ostomy clamp any type replacement only each: HCPC: A4363; Adhesive liquid or equal any type per oz: HCPC: A4364; Adhesive remover wipes any type per 50: HCPC: A4365; Ostomy vent any type each: HCPC: Ostomy vent any type each: HCPC: A4366; Ostomy belt each: HCPC: A4367; Ostomy filter any type each: HCPC: A4368; Ostomy skin barrier liquid (spray brush etc) per oz: HCPC: A4369; Code deleted for 2003.
Ostomy skin barrier paste per oz: HCPC: A4370; Ostomy skin barrier powder per oz: HCPC: A4371; Ostomy skin barrier solid 4x4 or equivalent with built-in convexity each: HCPC: A4372; Ostomy skin barrier with flange (solid flexible or accordion) with built-in convexity any size each: HCPC: A4373; Ostomy pouch drainable with faceplate attached plastic each: HCPC: A4375; Ostomy pouch drainable with faceplate attached rubber each: HCPC: A4376; Ostomy pouch drainable for use on faceplate plastic each: HCPC: A4377; Ostomy pouch drainable for use on faceplate rubber each: HCPC: A4378; Ostomy pouch urinary with faceplate attached plastic each: HCPC: A4379; Ostomy pouch urinary with faceplate attached rubber each: HCPC: A4380; Ostomy pouch urinary for use on faceplate plastic each: A4381; Ostomy pouch urinary for use on faceplate heavy plastic each: HCPC: A4382; Ostomy pouch urinary for use on faceplate rubber each: HCPC: A4383; Ostomy faceplate equivalent silicone ring each: HCPC: A4384; Ostomy skin barrier solid 4x4 or equivalent extended wear without built-in convexity each: HCPC: A4385; Ostomy pouch closed with barrier attached with built-in convexity (1 piece) each: HCPC: A4387; Ostomy pouch drainable with extended wear barrier attached (1 piece) each: HCPC: A4388; Ostomy pouch drainable with barrier attached with built-in convexity (1 piece) each: HCPC: A4389; Ostomy pouch drainable with extended wear barrier attached with built-in convexity (1 piece) each: HCPC: A4390; Ostomy pouch urinary with extended wear barrier attached (1 piece) each: HCPC: A4391; Ostomy pouch urinary with standard wear barrier attached with built-in convexity (1 piece) each: HCPC: A4392; Ostomy pouch urinary with extended wear barrier attached with built-in convexity (1 piece) each: HCPC: A4393; Ostomy deodorant with or without lubricant for use in ostomy pouch per fluid ounce: HCPC: A4394; Ostomy deodorant for use in ostomy pouch solid per tablet: HCPC: A4395; Ostomy belt with peristomal hernia support: HCPC: A4396; Irrigation supply; sleeve each: HCPC: A4397; Ostomy irrigation supply; bag each: HCPC: A4398; Ostomy irrigation supply; cone/catheter including brush: HCPC: A4399; Ostomy irrigation set: HCPC: A4400; Lubricant per ounce: HCPC: A4402; Ostomy ring each: HCPC: A4404; Ostomy skin barrier non-pectin based paste per ounce: HCPC: A4405; Ostomy skin barrier pectin-based paste per ounce: HCPC: A4406; Ostomy skin barrier with flange (solid flexible or accordion) extended wear with built-in convexity 4 x 4 inches or smaller each: HCPC: A4407; Ostomy skin barrier with flange (solid flexible or accordion) extended wear with built-in convexity larger than 4 x 4 inches each: HCPC: A4408; Ostomy skin barrier with flange (solid flexible or accordion) extended wear without built-in convexity 4 x 4 inches or smaller each: HCPC: A4409; Ostomy skin barrier with flange (solid flexible or accordion)

extended wear without built-in convexity larger than 4 x 4 inches each: HCPC: A4410; Ostomy skin barrier solid 4x4 or equivalent extended wear with built-in convexity each: HCPC: A4411; Ostomy pouch drainable high output for use on a barrier with flange (2 piece system) without filter each: HCPC: A4412; Ostomy pouch drainable high output for use on a barrier with flange (2 piece system) with filter each: HCPC: A4413; Ostomy skin barrier with flange (solid flexible or accordion) without built-in convexity 4 x 4 inches or smaller each: HCPC: A4414; Ostomy skin barrier with flange (solid flexible or accordion) without built-in convexity larger than 4x4 inches each: HCPC: A4415; Ostomy pouch closed with barrier attached with filter (1 piece) each: HCPC: A4416; Ostomy pouch closed with barrier attached with built-in convexity with filter (1 piece) each: HCPC: A4417; Ostomy pouch closed; without barrier attached with filter (1 piece) each: HCPC: A4418; Ostomy pouch closed; for use on barrier with non-locking flange with filter (2 piece) each: HCPC: A4419; Ostomy pouch closed; for use on barrier with locking flange (2 piece) each: HCPC: A4420; Ostomy absorbent material (sheet/pad/crystal packet) for use in ostomy pouch to thicken liquid stomal output each: HCPC: A4422; Ostomy pouch closed; for use on barrier with locking flange with filter (2 piece) each: HCPC: A4423; Ostomy pouch drainable with barrier attached with filter (1 piece) each: HCPC: A4424; Ostomy pouch drainable; for use on barrier with non-locking flange with filter (2 piece system) each: HCPC: A4425; Ostomy pouch drainable; for use on barrier with locking flange (2 piece system) each: HCPC: A4426; Ostomy pouch drainable; for use on barrier with locking flange with filter (2 piece system) each: HCPC: A4427; Ostomy pouch urinary with extended wear barrier attached with faucet-type tap with valve (1 piece) each: HCPC: A4428; Ostomy pouch urinary with barrier attached with built-in convexity with faucet-type tap with valve (1 piece) each: HCPC: A4429; Ostomy pouch urinary with extended wear barrier attached with built-in convexity with faucet-type tap with valve (1 piece) each: HCPC: A4430; Ostomy pouch urinary; with barrier attached with faucet-type tap with valve (1 piece) each: HCPC: A4431; Ostomy pouch urinary; for use on barrier with non-locking flange with faucet-type tap with valve (2 piece) each: HCPC: A4432; Ostomy pouch urinary; for use on barrier with locking flange (2 piece) each: HCPC: A4433; Ostomy pouch urinary; for use on barrier with locking flange with faucet-type tap with valve (2 piece) each: HCPC: A4434; Ostomy faceplate each: HCPC: A4361; Skin barrier; solid 4 x 4 or equivalent; each: HCPC: A4362; Ostomy clamp any type replacement only each: HCPC: A4363; Adhesive liquid or equal any type per oz: HCPC: A4364; Adhesive remover wipes any type per 50: HCPC: A4365; Ostomy vent any type each: HCPC: A4366; Ostomy belt each: HCPC: A4367; Ostomy filter any type each: HCPC: A4368; Ostomy skin barrier liquid (spray brush etc) per oz: HCPC: A4369; Ostomy skin barrier powder per oz: HCPC: A4371; Ostomy skin barrier solid 4x4 or equivalent with built-in convexity each: HCPC: A4372; Ostomy skin barrier with flange (solid flexible or accordion) with built-in convexity any size each: HCPC: A4373; Ostomy pouch drainable with faceplate attached plastic each: HCPC: A4375; Ostomy pouch drainable with faceplate attached rubber each: HCPC: A4376; Ostomy pouch drainable for use on faceplate plastic each: HCPC: A4377; Ostomy pouch drainable for use on faceplate rubber each: HCPC: A4378; Ostomy pouch urinary with faceplate attached plastic each: HCPC: A4379; Ostomy pouch urinary with faceplate attached rubber each: HCPC: A4380; Ostomy pouch urinary for use on faceplate plastic each: HCPC: A4381; Ostomy pouch urinary for use on faceplate heavy plastic each: HCPC: A4382; Ostomy pouch urinary for use on faceplate rubber each: HCPC: A4383; Ostomy faceplate equivalent silicone ring each: HCPC: A4384; Ostomy skin barrier solid 4x4 or equivalent extended wear without built-in convexity each: HCPC: A4385; Ostomy pouch closed with barrier attached with built-in convexity (1 piece) each: HCPC: A4387; Ostomy pouch drainable with extended wear barrier attached (1 piece) each: HCPC: A4388; Ostomy pouch drainable with barrier attached with built-in convexity (1 piece) each: HCPC: A4389; Ostomy pouch drainable with extended wear barrier attached with built-in convexity (1 piece) each: HCPC: A4390; Ostomy pouch urinary with extended wear barrier attached (1 piece) each: HCPC: A4391; Ostomy pouch urinary with standard wear barrier attached with built-in convexity (1 piece) each: HCPC: A4392; Ostomy pouch urinary with extended wear barrier attached with built-in convexity (1 piece) each: HCPC: A4393; Ostomy deodorant with or without lubricant for use in ostomy pouch per fluid ounce: HCPC: A4394; Ostomy deodorant for use in ostomy pouch solid per tablet: HCPC: A4395; Ostomy belt with peristomal hernia support: HCPC: A4396; Irrigation supply; sleeve each: HCPC: A4397; Ostomy irrigation supply; bag each: HCPC: A4398; Ostomy irrigation supply; cone/catheter including brush: HCPC: A4399; Ostomy irrigation set: HCPC: A4400; Lubricant per ounce: HCPC: A4402; Ostomy ring each: HCPC: Ostomy ring each: HCPC: Ostomy skin barrier non-pectin based paste per ounce: HCPC: A4405; Ostomy skin barrier pectin-based paste per ounce: HCPC: A4406; Ostomy skin barrier with flange (solid flexible or accordion) extended wear with built-in convexity 4 x 4 inches or smaller each: HCPC: A4407; Ostomy skin barrier with flange (solid flexible or accordion) extended wear with built-in convexity larger than 4 x 4 inches each: HCPC: A4408; Ostomy skin barrier with flange (solid flexible or accordion) extended wear without built-in convexity 4 x 4 inches or smaller each: HCPC: A4409; Ostomy skin barrier with flange (solid flexible or accordion) extended wear without built-in convexity larger than 4 x 4 inches each: HCPC: A4410; Ostomy skin barrier solid 4x4 or equivalent extended wear with built-in convexity each: HCPC: A4411; Ostomy pouch drainable high output for use on a barrier with flange (2 piece system) without filter each: HCPC: A4412; Ostomy pouch drainable high output for use on a barrier with flange (2 piece system) with filter each: HCPC: A4413; Ostomy skin barrier with flange (solid flexible or accordion) without built-in convexity 4 x 4 inches or smaller each: HCPC: A4414; Ostomy skin barrier with flange (solid flexible or accordion)

without built-in convexity larger than 4x4 inches each: HCPC: A4415; Ostomy pouch closed with barrier attached with filter (1 piece) each: HCPC: A4416; Ostomy pouch closed with barrier attached with built-in convexity with filter (1 piece) each: HCPC: A4417; Ostomy pouch closed; without barrier attached with filter (1 piece) each: HCPC: A4418; Ostomy pouch closed; for use on barrier with non-locking flange with filter (2 piece) each: HCPC: A4419; Ostomy pouch closed; for use on barrier with locking flange (2 piece) each: HCPC: A4420; Ostomy supply; miscellaneous: HCPC: A4421; Ostomy absorbent material (sheet/pad/crystal packet) for use in ostomy pouch to thicken liquid stomal output each: HCPC: A4422; Ostomy pouch closed; for use on barrier with locking flange with filter (2 piece) each: HCPC: A4423; Ostomy pouch drainable with barrier attached with filter (1 piece) each: A4424; Ostomy pouch drainable; for use on barrier with non-locking flange with filter (2 piece system) each: HCPC: A4425; Ostomy pouch drainable; for use on barrier with locking flange (2 piece system) each: HCPC: A4426; Ostomy pouch drainable; for use on barrier with locking flange with filter (2 piece system) each: HCPC: A4427; Ostomy pouch urinary with extended wear barrier attached with faucet-type tap with valve (1 piece) each: HCPC: A4428; Ostomy pouch urinary with barrier attached with built-in convexity with faucet-type tap with valve (1 piece) each: HCPC: A4429; Ostomy pouch urinary with extended wear barrier attached with built-in convexity with faucet-type tap with valve (1 piece) each: HCPC: A4430; Ostomy pouch urinary; with barrier attached with faucet-type tap with valve (1 piece) each: HCPC: A4431; Ostomy pouch urinary; for use on barrier with non-locking flange with faucet-type tap with valve (2 piece) each: HCPC: A4432; Ostomy pouch urinary; for use on barrier with locking flange (2 piece) each: HCPC: A4433; Ostomy pouch urinary; for use on barrier with locking flange with faucet-type tap with valve (2 piece) each: HCPC: A4434; Code deleted for 2003.
Adult incontinence garment (e.g. brief diaper) each: HCPC: A4360; Ostomy faceplate each: HCPC: A4361; Skin barrier; solid 4 x 4 or equivalent; each: HCPC: A4362; Ostomy clamp any type replacement only each: HCPC: A4363; Adhesive liquid or equal any type per oz: HCPC: A4364; Adhesive remover wipes any type per 50: HCPC: A4365; Ostomy vent any type each: HCPC: A4366; Ostomy belt each: HCPC: A4367; Ostomy filter any type each: HCPC: A4368; Ostomy skin barrier liquid (spray brush etc) per oz: HCPC: A4369; Ostomy skin barrier powder per oz: HCPC: A4371; Ostomy skin barrier solid 4x4 or equivalent with built-in convexity each: HCPC: A4372; Ostomy skin barrier with flange (solid flexible or accordion) with built-in convexity any size each: HCPC: A4373; Ostomy pouch drainable with faceplate attached plastic each: HCPC: A4375; Ostomy pouch drainable with faceplate attached rubber each: HCPC: A4376; Ostomy pouch drainable for use on faceplate plastic each: HCPC: A4377; Ostomy pouch drainable for use on faceplate rubber each: HCPC: A4378; Ostomy pouch urinary with faceplate attached plastic each: HCPC: A4379; Ostomy pouch urinary with faceplate attached rubber each: HCPC: A4380; Ostomy pouch urinary for use on faceplate plastic each: HCPC: A4381; Ostomy pouch urinary for use on faceplate heavy plastic each: HCPC: A4382; Ostomy pouch urinary for use on faceplate rubber each: HCPC: A4383; Ostomy faceplate equivalent silicone ring each: HCPC: A4384; Ostomy skin barrier solid 4x4 or equivalent extended wear without built-in convexity each: HCPC: A4385; Ostomy pouch closed with barrier attached with built-in convexity (1 piece) each: HCPC: A4387; Ostomy pouch drainable with extended wear barrier attached (1 piece) each: HCPC: A4388; Ostomy pouch drainable with barrier attached with built-in convexity (1 piece) each: HCPC: A4389; Ostomy pouch drainable with extended wear barrier attached with built-in convexity (1 piece) each: HCPC: A4390; Ostomy pouch urinary with extended wear barrier attached (1 piece) each: HCPC: A4391; Ostomy pouch urinary with standard wear barrier attached with built-in convexity (1 piece) each: HCPC: A4392; Ostomy pouch urinary with extended wear barrier attached with built-in convexity (1 piece) each: HCPC: A4393; Ostomy deodorant with or without lubricant for use in ostomy pouch per fluid ounce: HCPC: A4394; Ostomy deodorant for use in ostomy pouch solid per tablet: HCPC: A4395; Ostomy belt with peristomal hernia support: HCPC: A4396; Irrigation supply; sleeve each: HCPC: A4397; Ostomy irrigation supply; bag each: HCPC: A4398; Ostomy irrigation supply; cone/catheter including brush: HCPC: A4399; Ostomy irrigation set: HCPC: A4400; Lubricant per ounce: HCPC: A4402; Ostomy ring each: HCPC: A4404; Ostomy skin barrier non-pectin based paste per ounce: HCPC: A4405; Ostomy skin barrier pectin-based paste per ounce: HCPC: A4406; Ostomy skin barrier with flange (solid flexible or accordion) extended wear with built-in convexity 4 x 4 inches or smaller each: HCPC: A4407; Ostomy skin barrier with flange (solid flexible or accordion) extended wear with built-in convexity larger than 4 x 4 inches each: HCPC: A4408; Ostomy skin barrier with flange (solid flexible or accordion) extended wear without built-in convexity 4 x 4 inches or smaller each: HCPC: A4409; Ostomy skin barrier with flange (solid flexible or accordion) extended wear without built-in convexity larger than 4 x 4 inches each: HCPC: A4410; Ostomy skin barrier solid 4x4 or equivalent extended wear with built-in convexity each: HCPC: A4411; Ostomy pouch drainable high output for use on a barrier with flange (2 piece system) without filter each: HCPC: A4412; Ostomy pouch drainable high output for use on a barrier with flange (2 piece system) with filter each: HCPC: A4413; Ostomy skin barrier with flange (solid flexible or accordion) without built-in convexity 4 x 4 inches or smaller each: HCPC: A4414; Ostomy skin barrier with flange (solid flexible or accordion) without built-in convexity larger than 4x4 inches each: HCPC: A4415; Ostomy pouch closed with barrier attached with filter (1 piece) each: HCPC: A4416; Ostomy pouch closed with barrier attached with built-in convexity with filter (1 piece) each: HCPC: A4417; Ostomy pouch closed; without barrier attached with filter (1 piece) each: HCPC: A4418; Ostomy pouch closed; for use on barrier with non-locking flange with filter (2 piece) each: HCPC: A4419; Ostomy pouch closed; for

use on barrier with locking flange (2 piece) each: HCPC: A4420; Ostomy supply; miscellaneous: HCPC: A4421; Ostomy absorbent material (sheet/pad/crystal packet) for use in ostomy pouch to thicken liquid stomal output each: HCPC: A4422; Ostomy pouch closed; for use on barrier with locking flange with filter (2 piece) each: HCPC: A4423; Ostomy pouch drainable with barrier attached with filter (1 piece) each: HCPC: A4424; Ostomy pouch drainable; for use on barrier with non-locking flange with filter (2 piece system) each: HCPC: A4425; Ostomy pouch drainable; for use on barrier with locking flange (2 piece system) each: HCPC: A4426; Ostomy pouch drainable; for use on barrier with locking flange with filter (2 piece system) each: HCPC: A4427; Ostomy pouch urinary with extended wear barrier attached with faucet-type tap with valve (1 piece) each: HCPC: A4428; Ostomy pouch urinary with barrier attached with built-in convexity with faucet-type tap with valve (1 piece) each: HCPC: A4429; Ostomy pouch urinary with extended wear barrier attached with built-in convexity with faucet-type tap with valve (1 piece) each: HCPC: A4430; Ostomy pouch urinary; with barrier attached with faucet-type tap with valve (1 piece) each: HCPC: A4431; Ostomy pouch urinary; for use on barrier with non-locking flange with faucet-type tap with valve (2 piece) each: HCPC: A4432; Ostomy pouch urinary; for use on barrier with locking flange (2 piece) each: HCPC: A4433; Ostomy pouch urinary; for use on barrier with locking flange with faucet-type tap with valve (2 piece) each: HCPC: A4434; Wig, Any Type, Each: HCPC: A9282; Chemotherapy Administration, Intravenous; Push Technique: HCPC: C8953; Chemotherapy Administration, Intravenous; Infusion Technique, Up To One Hour: HCPC: C8954; Chemotherapy Administration, Intravenous; Infusion Technique, Each Additional Hour (List Separately In Addition To C8954): HCPC: C8955; Complete Cbc, Automated (Hgb, Hct, Rbc, Wbc, Without Platelet Count) And Automated Wbc Differential Count: HCPC: G0306; Complete (Cbc), Automated (Hgb, Hct, Rbc, Wbc; Without Platelet Count): HCPC: G0307; Chemotherapy Assessment For Nausea And/Or Vomiting, Patient Reported, Performedat The Time Of Chemotherapy Administration; Assessment Level One: Not At All(For Use In A Medicare-Approved Demonstration Project): HCPC: G9021; Chemotherapy Assessment For Nausea And/Or Vomiting, Patient Reported, Performed at The Time Of Chemotherapy Administration; Assessment Level Two: A Little (Foruse In A Medicare-Approved Demonstration Project): HCPC: G9022; Chemotherapy Assessment For Nausea And/Or Vomiting, Patient Reported, Performedat The Time Of Chemotherapy Administration; Assessment Level Three: Quite A Bit(For Use In A Medicare-Approved Demonstration Project): HCPC: G9023; Chemotherapy Assessment For Nausea And/Or Vomiting, Patient Reported, Performedat The Time Of Chemotherapy Administration; Assessment Level Four: Very Much(For Use In A Medicare-Approved Demonstration Project): HCPC: G9024; Chemotherapy Assessment For Pain, Patient Reported, Performed At The Time Ofchemotherapy Administration, Assessment Level One: Not At All (For Use In Amedicare-Approved Demonstration Project): HCPC: G9025; Chemotherapy Assessment For Pain, Patient Reported, Performed At The Time Ofchemotherapy Administration, Assessment Level Two: A Little (For Use In Amedicare-Approved Demonstration Project): HCPC: G9026; Chemotherapy Assessment For Pain, Patient Reported, Performed At The Time Ofchemotherapy Administration, Assessment Level Three: Quite A Bit (For Use In Amedicare-Approved Demonstration Project): HCPC: G9027; Chemotherapy Assessment For Pain, Patient Reported, Performed At The Time Ofchemotherapy Administration, Assessment Level Four: Very Much (For Use In Amedicare-Approved Demonstration Project): HCPC: G9028; Chemotherapy Assessment For Lack Of Energy (Fatigue), Patient Reported,Performed At The Time Of Chemotherapy Administration, Assessment Level One: Notat All (For Use In A Medicare-Approved Demonstration Project): HCPC: G9029; Chemotherapy Assessment For Lack Of Energy (Fatigue), Patient Reported,Performed At The Time Of Chemotherapy Administration, Assessment Level Two: Alittle (For Use In A Medicare-Approved Demonstration Project): HCPC: G9030; Chemotherapy Assessment For Lack Of Energy (Fatigue), Patient Reported,Performed At The Time Of Chemotherapy Administration, Assessment Level Three:Quite A Bit (For Use In A Medicare-Approved Demonstration Project): HCPC: G9031; Chemotherapy Assessment For Lack Of Energy (Fatigue), Patient Reported,Performed At The Time Of Chemotherapy Administration, Assessment Level Four:Very Much (For Use In A Medicare-Approved Demonstration Project) Performed At The Time Of Chemotherapy Administration, Assessment Level Four: Very Much (For Use In A Medicare-Approved Demonstration Project): HCPC: G9032; Oncology; Primary Focus Of Visit; Work-Up, Evaluation, Or Staging At The Timeof Cancer Diagnosis Or Recurrence (For Use In A Medicare-Approved Demonstrationproject): HCPC: G9050; Oncology; Primary Focus Of Visit; Treatment Decision-Making After Disease Isstaged Or Restaged, Discussion Of Treatment Options, Supervising/Coordinatingactive Cancer Directed Therapy Or Managing Consequences Of Cancer Directedtherapy (For Use In A Medicare-Approved Demonstration Project): HCPC: G9051; Oncology; Primary Focus Of Visit; Surveillance For Disease Recurrence Forpatient Who Has Completed Definitive Cancer-Directed Therapy And Currentlylacks Evidence Of Recurrent Disease; Cancer Directed Therapy Might Beconsidered In The Future (For Use In A Medicare-Approved Demonstration Project): HCPC: G9052; Oncology; Primary Focus Of Visit; Expectant Management Of Patient With Evidenceof Cancer For Whom No Cancer Directed Therapy Is Being Administered Or Arrangedat Present; Cancer Directed Therapy Might Be Considered In The Future (For Usein A Medicare-Approved Demonstration Project): HCPC: G9053; Oncology; Primary Focus Of Visit; Supervising, Coordinating Or Managing Care Ofpatient With Terminal Cancer Or For Whom Other Medical Illness Prevents Furthercancer Treatment; Includes Symptom Management, End-Of-Life Care Planning,Management Of Palliative Therapies (For Use In A Medicare-

Approveddemonstration Project): HCPC: G9054; Oncology; Primary Focus Of Visit; Other, Unspecified Service Not Otherwiselisted (For Use In A Medicare-Approved Demonstration Project): HCPC: G9055; Oncology; Practice Guidelines; Management Adheres To Guidelines (For Use In Amedicare-Approved Demonstration Project): HCPC: G9056; Oncology; Practice Guidelines; Management Differs From Guidelines As A Result of Patient Enrollment In An Institutional Review Board Approved Clinical Trial(For Use In A Medicare-Approved Demonstration Project): HCPC: G9057; Oncology; Practice Guidelines; Management Differs From Guidelines Because Thetreating Physician Disagrees With Guideline Recommendations (For Use In Amedicare-Approved Demonstration Project): HCPC: G9058; Oncology; Practice Guidelines; Management Differs From Guidelines Because Thepatient, After Being Offered Treatment Consistent With Guidelines, Has Optedfor Alternative Treatment Or Management, Including No Treatment (For Use In Amedicare-Approved Demonstration Project): HCPC: G9059; Oncology; Practice Guidelines; Management Differs From Guidelines For Reason(S)Associated With Patient Comorbid Illness Or Performance Status Not Factoredinto Guidelines (For Use In A Medicare-Approved Demonstration Project): HCPC: G9060; Oncology; Practice Guidelines; Patient´S Condition Not Addressed By Availableguidelines (For Use In A Medicare-Approved Demonstration Project): HCPC: G9061; Oncology; Practice Guidelines; Management Differs From Guidelines For Otherreason(S) Not Listed (For Use In A Medicare-Approved Demonstration Project): HCPC: G9062; Complete Cbc, Automated (Hgb, Hct, Rbc, Wbc, Without Platelet Count) And Automated Wbc Differential Count: HCPC: G0306; Complete (Cbc), Automated (Hgb, Hct, Rbc, Wbc; Without Platelet Count): HCPC: G0307; Prescription Antiemetic Drug, Oral, Per 1 Mg, For Use In Conjunction With Oralanti-Cancer Drug, Not Otherwise Specified: HCPC: K0415; Prescription Antiemetic Drug, Rectal, Per 1 Mg, For Use In Conjunction Withoral Anti-Cancer Drug, Not Otherwise Specified: HCPC: K0416; Hospice Referral Visit (Advising Patient And Family Of Care Options) Performedby Nurse, Social Worker, Or Other Designated Staff: HCPC: S0255; Counseling And Discussion Regarding Advance Directives Or End Of Life Careplanning And Decisions, With Patient And/Or Surrogate (List Separately Inaddition To Code For Appropriate Evaluation And Management Service): HCPC: S0257; History And Physical (Outpatient Or Office) Related To Surgical Procedure (Listseparately In Addition To Code For Appropriate Evaluation And Managementservice): S0260; Genetic Counseling, Under Physician Supervision, Each 15 Minutes: HCPC: S0265; Physician Management Of Patient Home Care, Standard Monthly Case Rate (Per 30Days): HCPC: S0270; Physician Management Of Patient Home Care, Hospice Monthly Case Rate (Per 30Days): HCPC: S0271; Home Health Aide Or Certified Nurse Assistant, Providing Care In The Home; Per Hour: HCPC: S9122; Nursing Care, In The Home; By Registered Nurse, Per Hour (Use For General Nursing Care Only, Not To Be Used When Cpt Codes 99500-99602 Can Be Used): HCPC: S9123; Nursing Care, In The Home; By Licensed Practical Nurse, Per Hour: HCPC: S9124; Respite Care, In The Home, Per Diem: HCPC: S9125; Hospice Care, In The Home, Per Diem: HCPC: S9126; Social Work Visit, In The Home, Per Diem: HCPC: S9127.

Prescription drugs

The following codes will be used to identify colon cancer-related medications or medication-related services during the measurement period, regardless of corresponding ICD-9 codes (See alsoTable CCTxF in written measure specification): Chemotherapy administration, subcutaneous or intramuscular; non-hormonal anti-neoplastic: CPT: 9640; Chemotherapy administration, subcutaneous or intramuscular; hormonal anti-neoplastic: CPT: 96402; Chemotherapy administration; intralesional, up to and including 7 lesions: CPT: 96405; Chemotherapy administration; intralesional, more than 7 lesions: CPT: 96406; Chemotherapy administration; intravenous, push technique, single or initial substance/drug: CPT: 96409; Chemotherapy administration; intravenous, push technique, each additional substance/drug (List separately in addition to code for primary procedure): CPT: 96411; Chemotherapy administration, intravenous infusion technique; up to 1 hour, single or initial substance/drug: CPT: 96413; Chemotherapy administration, intravenous infusion technique; each additional hour (List separately in addition to code for primary procedure): CPT: 96415; Chemotherapy administration, intravenous infusion technique; initiation of prolonged chemotherapy infusion (more than 8 hours), requiring use of a portable or implantable pump: CPT: 96416; Chemotherapy administration, intravenous infusion technique; each additional sequential infusion (different substance/drug), up to 1 hour (List separately in addition to code for primary procedure): CPT: 96417; Chemotherapy administration, intra-arterial; push technique: CPT: 96420; Chemotherapy administration, intra-arterial; infusion technique, up to one hour: CPT: 96422; Chemotherapy administration, intra-arterial; infusion technique, each additional hour (List separately in addition to code for primary procedure): CPT: 96423; Chemotherapy administration, intra-arterial; infusion technique, initiation of prolonged infusion (more than 8 hours), requiring the use of a portable or implantable pump: CPT: 96425; Chemotherapy administration into pleural cavity, requiring and including thoracentesis: CPT: 96440; Chemotherapy administration into peritoneal cavity, requiring and including peritoneocentesis: CPT: 96445; Chemotherapy administration, into CNS (eg, intrathecal), requiring and including spinal puncture: CPT: 96450; Refilling and maintenance of portable pump: CPT: 96521; Refilling and maintenance of implantable pump or reservoir for drug delivery, systemic (eg, intravenous, intra-arterial): CPT: 96522; Irrigation of implanted venous access device for drug delivery systems: CPT: 96523;

Chemotherapy injection, subarachnoid or intraventricular via subcutaneous reservoir, single or multiple agents: CPT: 96542; Unlisted chemotherapy procedure: CPT: 96549;

Or

INJECTION, AMIFOSTINE, 500 MG: HCPC: J0207; INJECTION, AMOBARBITAL, UP TO 125 MG:HCPC: J0300; INJECTION, BUSULFAN, 1 MG: CPT: INJECTION, BUSULFAN, 1 MG; INJECTION, LEUCOVORIN CALCIUM, PER 50 MG: HCPC: J0640; INJECTION, LEVOLEUCOVORIN CALCIUM, 0.5 MG: HCPC: J0641; INJECTION, PROCHLORPERAZINE, UP TO 10 MG: HCPC: J0780; INJECTION, DECITABINE, 1 MG: HCPC: J0894; INJECTION, BROMPHENIRAMINE MALEATE, PER 10 MG: HCPC: J0945; INJECTION, DIMENHYDRINATE, UP TO 50 MG: HCPC: J1240; INJECTION, DOLASETRON MESYLATE, 10 MG: HCPC: J1260; INJECTION, FILGRASTIM (G-CSF), 300 MCG: HCPC: J1440; INJECTION, FILGRASTIM (G-CSF), 480 MCG: HCPC: J1441; INJECTION, FOSAPREPITANT, 1 MG: HCPC: J1453; INJECTION, GRANISETRON HYDROCHLORIDE, 100 MCG: HCPC: J1626; INJECTION, OPRELVEKIN, 5 MG: HCPC: J2355; INJECTION, ONDANSETRON HYDROCHLORIDE, PER 1 MG: HCPC: J2405; INJECTION, PALIFERMIN, 50 MICROGRAMS: HCPC: J2425; J2425: HCPC: J2469; INJECTION, PEGFILGRASTIM, 6 MG: HCPC: J2505; INJECTION, PROMETHAZINE HCL, UP TO 50 MG: HCPC: J2550; INJECTION, METOCLOPRAMIDE HCL, UP TO 10 MG: HCPC: J2765; INJECTION, RASBURICASE, 0.5 MG: HCPC: J2783; INJECTION, SARGRAMOSTIM (GM-CSF), 50 MCG: HCPC: J2820; INJECTION, CHLORPROMAZINE HCL, UP TO 50 MG: HCPC: J3230; INJECTION, TRIMETHOBENZAMIDE HCL, UP TO 200 MG: HCPC: J3250; INJECTION, THIETHYLPERAZINE MALEATE, UP TO 10 MG: HCPC: J3280; INJECTION, PERPHENAZINE, UP TO 5 MG: HCPC: J3310; INJECTION, TRIPTORELIN PAMOATE, 3.75 MG: HCPC: J3315; ANTIEMETIC DRUG, RECTAL/SUPPOSITORY, NOT OTHERWISE SPECIFIED: HCPC: J8498; INFUSION, NORMAL SALINE SOLUTION , 1000 CC : HCPC: J7030; INFUSION, NORMAL SALINE SOLUTION, STERILE (500 ML=1 UNIT): HCPC: J7040; 5% DEXTROSE/NORMAL SALINE (500 ML = 1 UNIT): HCPC: J7042; INFUSION, NORMAL SALINE SOLUTION , 250 CC: HCPC: J7050; STERILE SALINE OR WATER, UP TO 5 CC: HCPC: J7051; 5% DEXTROSE/WATER (500 ML = 1 UNIT): HCPC: J7060; INFUSION, D5W, 1000 CC: HCPC: J7070; INFUSION, DEXTRAN 40, 500 ML: HCPC: J7100; INFUSION, DEXTRAN 75, 500 ML: HCPC: J7110; RINGERS LACTATE INFUSION, UP TO 1000 CC: HCPC: J7120; HYPERTONIC SALINE SOLUTION, 50 OR 100 MEQ, 20 CC VIAL: HCPC: J7130; APREPITANT, ORAL, 5 MG: HCPC: J8501; BUSULFAN; ORAL, 2 MG: HCPC: J8510; CABERGOLINE, ORAL, 0.25 MG: HCPC: J8515; CAPECITABINE, ORAL, 150 MG: HCPC: J8520; CAPECITABINE, ORAL, 500 MG: HCPC: J8521; CYCLOPHOSPHAMIDE; ORAL, 25 MG: HCPC: J8530; DEXAMETHASONE, ORAL, 0.25 MG: HCPC: J8540; ETOPOSIDE; ORAL, 50 MG: HCPC: J8560; GEFITINIB, ORAL, 250 MG: HCPC: J8565; ANTIEMETIC DRUG, ORAL, NOT OTHERWISE SPECIFIED: HCPC: J8597; MELPHALAN; ORAL, 2 MG: HCPC: J8600; METHOTREXATE; ORAL, 2.5 MG: HCPC: J8610; NABILONE, ORAL, 1 MG: HCPC: J8650; TEMOZOLOMIDE, ORAL, 5 MG: HCPC: J8700; TOPOTECAN, ORAL, 0.25 MG; HCPC: J8705; PRESCRIPTION DRUG, ORAL, CHEMOTHERAPEUTIC, NOS: HCPC: J8999; INJECTION, DOXORUBICIN HYDROCHLORIDE, 10 MG: HCPC: J9000; INJECTION, DOXORUBICIN HYDROCHLORIDE, ALL LIPID FORMULATIONS, 10 MG: HCPC: J9001; INJECTION, ALEMTUZUMAB, 10 MG: HCPC: J9010; INJECTION, ALDESLEUKIN, PER SINGLE USE VIAL: HCPC: J9015; INJECTION, ARSENIC TRIOXIDE, 1 MG: HCPC: J9017; INJECTION, ASPARAGINASE, 10,000 UNITS: HCPC: J9020; INJECTION, AZACITIDINE, 1 MG: HCPC: J9025; INJECTION, CLOFARABINE, 1 MG: HCPC: J9027; BCG (INTRAVESICAL) PER INSTILLATION: HCPC: J9031; INJECTION, BENDAMUSTINE HCL, 1 MG: HCPC: J9033; INJECTION, BEVACIZUMAB, 10 MG: HCPC: J9035; INJECTION, BLEOMYCIN SULFATE, 15 UNITS: HCPC: J9040; INJECTION, BORTEZOMIB, 0.1 MG: HCPC: J9041; INJECTION, CARBOPLATIN, 50 MG: HCPC: J9045; INJECTION, CARMUSTINE, 100 MG: HCPC: J9050; INJECTION, CETUXIMAB, 10 MG: HCPC: J9055; CISPLATIN, POWDER OR S0LUTION, PER 10 MG: HCPC: J9060; CISPLATIN, 50 MG; INJECTION, CLADRIBINE, PER 1 MG: HCPC: J9065; CYCLOPHOSPHAMIDE, 100 MG: J9070; CYCLOPHOSPHAMIDE, 200 MG: HCPC: J9080; CYCLOPHOSPHAMIDE, 500 MG: HCPC: J9090; CYCLOPHOSPHAMIDE, 1.0 GRAM: HCPC: J9091; CYCLOPHOSPHAMIDE, 2.0 GRAM: HCPC: J9092; CYCLOPHOSPHAMIDE, LYOPHILIZED, 100 MG: HCPC: J9093; CYCLOPHOSPHAMIDE, LYOPHILIZED, 200 MG: HCPC: J9094; CYCLOPHOSPHAMIDE, LYOPHILIZED, 500 MG: HCPC: J9095; CYCLOPHOSPHAMIDE, LYOPHILIZED, 1.0 GRAM: HCPC: J9096; CYCLOPHOSPHAMIDE, LYOPHILIZED, 2.0 GRAM: HCPC: J9097; INJECTION, CYTARABINE LIPOSOME, 10 MG: HCPC: J9098; INJECTION, CYTARABINE, 100 MG: HCPC: J9100; INJECTION, CYTARABINE, 500 MG: HCPC: J9110; INJECTION, DACTINOMYCIN, 0.5 MG: HCPC: J9120; DACARBAZINE, 100 MG: HCPC: J9130; DACARBAZINE, 200 MG: HCPC: J9140; INJECTION, DAUNORUBICIN, 10 MG: HCPC: J9150; INJECTION, DAUNORUBICIN CITRATE, LIPOSOMAL FORMULATION, 10 MG: HCPC: J9151; INJECTION, DENILEUKIN DIFTITOX, 300 MICROGRAMS: HCPC: J9160; INJECTION, DIETHYLSTILBESTROL DIPHOSPHATE, 250 MG: HCPC: J9165; INJECTION, DOCETAXEL, 20 MG: HCPC: J9170; INJECTION, EPIRUBICIN HCL, 2 MG: HCPC:

J9178; INJECTION, ETOPOSIDE, 10 MG: HCPC: J9181; ETOPOSIDE, 100 MG: HCPC: J9182; INJECTION, FLUDARABINE PHOSPHATE, 50 MG: HCPC: J9185; INJECTION, FLUOROURACIL, 500 MG: HCPC: J9190; INJECTION, FLOXURIDINE, 500 MG: HCPC: J9200; INJECTION, GEMCITABINE HYDROCHLORIDE, 200 MG: HCPC: J9201; GOSERELIN ACETATE IMPLANT, PER 3.6 MG: HCPC: J9202; INJECTION, IRINOTECAN, 20 MG: HCPC: J9206; INJECTION, IXABEPILONE, 1 MG: HCPC: J9207; INJECTION, IFOSFAMIDE, 1 GRAM: HCPC: J9208; INJECTION, MESNA, 200 MG: HCPC: J9209; INJECTION, IDARUBICIN HYDROCHLORIDE, 5 MG: HCPC: J9211; INJECTION, INTERFERON ALFACON-1, RECOMBINANT, 1 MICROGRAM: HCPC: J9212; INJECTION, INTERFERON, ALFA-2A, RECOMBINANT, 3 MILLION UNITS: HCPC: J9213; INJECTION, INTERFERON, ALFA-2B, RECOMBINANT, 1 MILLION UNITS: HCPC: J9214; INJECTION, INTERFERON, ALFA-N3, (HUMAN LEUKOCYTE DERIVED), 250,000 IU: HCPC: J9215; INJECTION, INTERFERON, GAMMA 1-B, 3 MILLION UNITS: HCPC: J9216; LEUPROLIDE ACETATE (FOR DEPOT SUSPENSION), 7.5 MG: HCPC: J9217; LEUPROLIDE ACETATE, PER 1 MG: HCPC: J9218; LEUPROLIDE ACETATE IMPLANT, 65 MG: HCPC: J9219; HISTRELIN IMPLANT (VANTAS), 50 MG: HCPC: J9225; HISTRELIN IMPLANT (SUPPRELIN LA), 50 MG: HCPC: J9226; INJECTION, MECHLORETHAMINE HYDROCHLORIDE, (NITROGEN MUSTARD), 10 MG: HCPC: J9230; INJECTION, MELPHALAN HYDROCHLORIDE, 50 MG: HCPC: J9245; METHOTREXATE SODIUM, 5 MG: HCPC: J9250; METHOTREXATE SODIUM, 50 MG: HCPC: J9260; INJECTION, NELARABINE, 50 MG: HCPC: J9261; INJECTION, OXALIPLATIN, 0.5 MG: HCPC: J9263; INJECTION, PACLITAXEL PROTEIN-BOUND PARTICLES, 1 MG: HCPC: J9264; INJECTION, PACLITAXEL, 30 MG: HCPC: J9265; INJECTION, PEGASPARGASE, PER SINGLE DOSE VIAL: HCPC: J9266; INJECTION, PENTOSTATIN, 10 MG: HCPC: J9268; INJECTION, PLICAMYCIN, 2.5 MG: HCPC: J9270; MITOMYCIN, 5 MG: HCPC: J9280; MITOMYCIN, 20 MG: HCPC: J9290; MITOMYCIN, 40 MG: HCPC: J9291; INJECTION, MITOXANTRONE HYDROCHLORIDE, PER 5 MG: HCPC: J9293; INJECTION, GEMTUZUMAB OZOGAMICIN, 5 MG: HCPC: J9300; INJECTION, PANITUMUMAB, 10 MG: HCPC: J9303; INJECTION, PEMETREXED, 10 MG: HCPC: J9305; INJECTION, PEMETREXED, 10 MG: H INJECTION, PEMETREXED, 10 MG: HCPC: J9305; INJECTION, RITUXIMAB, 100 MG: HCPC: J9310; INJECTION, STREPTOZOCIN, 1 GRAM: HCPC: J9320; INJECTION, TEMSIROLIMUS, 1 MG: HCPC: J9330; INJECTION, THIOTEPA, 15 MG: HCPC: J9340; INJECTION, TOPOTECAN, 4 MG: HCPC: J9350; INJECTION, TRASTUZUMAB, 10 MG: HCPC: J9355; INJECTION, VALRUBICIN, INTRAVESICAL, 200 MG: HCPC: J9357; INJECTION, VINBLASTINE SULFATE, 1 MG: HCPC: J9360; VINCRISTINE SULFATE, 1 MG: HCPC: J9370; VINCRISTINE SULFATE, 2 MG: HCPC: VINCRISTINE SULFATE, 5 MG: HCPC: J9380; INJECTION, VINORELBINE TARTRATE, 10 MG: HCPC: J9390; INJECTION, FULVESTRANT, 25 MG: HCPC: J9395; INJECTION, PORFIMER SODIUM, 75 MG: HCPC: J9600; NOT OTHERWISE CLASSIFIED, ANTINEOPLASTIC DRUGS: HCPC: J9999; CHEMOTHERAPY ADMINISTRATION BY OTHER THAN INFUSION TECHNIQUE ONLY (EG SUBCUTANEOUS, INTRAMUSCULAR, PUSH), PER VISIT: HCPC: Q0083; CHEMOTHERAPY ADMINISTRATION BY INFUSION TECHNIQUE ONLY, PER VISIT: HCPC: Q0084; CHEMOTHERAPY ADMINISTRATION BY BOTH INFUSION TECHNIQUE AND OTHER TECHIQUE(S) (EG SUBCUTANEOUS, INTRAMUSCULAR, PUSH), PER VISIT: HCPC: Q0085; INJECTION, DAPTOMYCIN, 1 MG: HCPC: J0878; INJECTION, DORIPENEM, 10 MG: HCPC: J1267; INJECTION, ERTAPENEM SODIUM, 500 MG: HCPC: J1335; INJECTION, GARAMYCIN, GENTAMICIN, UP TO 80 MG: HCPC: J1580; INJECTION, GATIFLOXACIN, 10MG: HCPC: J1590; INJECTION, KANAMYCIN SULFATE, UP TO 500 MG: HCPC: J1840; INJECTION, KANAMYCIN SULFATE, UP TO 75 MG: HCPC: J1850; INJECTION, CEPHALOTHIN SODIUM, UP TO 1 GRAM: HCPC: J1890; INJECTION, LEVOFLOXACIN, 250 MG: HCPC: J1956; INJECTION, LINCOMYCIN HCL, UP TO 300 MG: HCPC: J2010; INJECTION, LINEZOLID, 200MG: HCPC: J2020; INJECTION, MEROPENEM, 100 MG: HCPC: J2185; INJECTION, MOXIFLOXACIN, 100 MG: HCPC: J2280; INJECTION, OXYTETRACYCLINE HCL, UP TO 50 MG: HCPC: J2460; INJECTION, PENICILLIN G PROCAINE, AQUEOUS, UP TO 600,000 UNITS: HCPC: J2510; INJECTION, PENICILLIN G POTASSIUM, UP TO 600,000 UNITS: HCPC: J2540; INJECTION, PIPERACILLIN SODIUM/TAZOBACTAM SODIUM, 1 GRAM/0.125 GRAMS (1.125: HCPC: J2543; INJECTION, OXACILLIN SODIUM, UP TO 250 MG: HCPC: J2700; INJECTION, QUINUPRISTIN/DALFOPRISTIN, 500 MG (150/350): HCPC: J2770; INJECTION, STREPTOMYCIN, UP TO 1 GM: HCPC: J3000; INJECTION, TIGECYCLINE, 1 MG: HCPC: J3243; INJECTION, TOBRAMYCIN SULFATE, UP TO 80 MG: HCPC: J3260; INJECTION, SPECTINOMYCIN DIHYDROCHLORIDE, UP TO 2 GM: HCPC: J3320; INJECTION, VANCOMYCIN HCL, 500 MG: HCPC: J3370; INJECTION FLUCONAZOLE, 200 MG: HCPC: J1450; INJECTION, ITRACONAZOLE, 50 MG: HCPC: J1835; INJECTION, MICAFUNGIN SODIUM, 1 MG: HCPC: J2248; INJECTION, VORICONAZOLE, 10 MG: HCPC: J3465; INJECTION, EPOETIN ALPHA, (FOR NON ESRD USE), PER 1000 UNITS: HCPC: Q0136; INJECTION, DARBEPOETIN ALFA, 1 MCG (NON-ESRD USE): HCPC: Q0137; AZITHROMYCIN DIHYDRATE, ORAL, CAPSULES/POWDER, 1 GRAM: HCPC: Q0144; DIPHENHYDRAMINE HYDROCHLORIDE, 50 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT TIME OF CHEMOTHERAPY TREATMENT NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0163;

PROCHLORPERAZINE MALEATE, 5 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0164; PROCHLORPERAZINE MALEATE, 10 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0165; GRANISETRON HYDROCHLORIDE, 1 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 24 HOUR DOSAGE REGIMEN: HCPC: Q0166; COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0167; DRONABINOL, 5 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0168; PROMETHAZINE HYDROCHLORIDE, 12.5 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0169; PROMETHAZINE HYDROCHLORIDE, 25 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0170; CHLORPROMAZINE HYDROCHLORIDE, 10 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0171; CHLORPROMAZINE HYDROCHLORIDE, 25 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0172; TRIMETHOBENZAMIDE HYDROCHLORIDE, 250 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0173; THIETHYLPERAZINE MALEATE, 10 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0174; PERPHENAZINE, 4 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0175; PERPHENAZINE, 8MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0176; USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0177; HYDROXYZINE PAMOATE, 50 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0178; ONDANSETRON HYDROCHLORIDE 8 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0179; DOLASETRON MESYLATE, 100 MG, ORAL, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR AN IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 24 HOUR DOSAGE REGIMEN: HCPC: Q0180; UNSPECIFIED ORAL DOSAGE FORM, FDA APPROVED PRESCRIPTION ANTI-EMETIC, FOR USE AS A COMPLETE THERAPEUTIC SUBSTITUTE FOR A IV ANTI-EMETIC AT THE TIME OF CHEMOTHERAPY TREATMENT, NOT TO EXCEED A 48 HOUR DOSAGE REGIMEN: HCPC: Q0181

OR

Benzodiazepines: THERCLS = 64: alprazolam, bromazepam, chlordiazepoxide, clonazepam, clorazepate, diazepam, lorazepam, medazepam, nordazepam, oxazepam, prazepam; Antineoplastic Agents, NEC: THERCLS = 21; Antiemetics, NEC: THERCLS = 160; Hematopoietic, Agents, NEC: THERCLS = 42; Antidepressants: THERCLS = 69; Pain medications: THERCLS = 57, 58, 59, 60, 61, 62; Colonoscopy Prep Medications: Product Names: Tridate, Colyte Flavored, Oral Colonic Lavage, Trilyte w/Flavor Packs, Fleet Prep Kit (1-6), PEF 35550 & Electrolytes, Evac-Q-Kwik,

Nulytely, Co-Lav, Go-Evac, Colyte, PEG-Lyte, Golytely, Lax Prepare, Moviprep

Rationale:

The intent is to identify patients with colon cancer and therefore the measure focuses on patients with a colectomy and a primary diagnosis of colon cancer. It is felt that this will identify the majority of patients with colon cancer given this is the standard of care. Codes for eligible colectomies include both open and laparoscopic colectomy as these are both used in the treatment of colon cancer. These CPT, codes, present in any field, will be used to identify colectomy patients during the measurement period, along with a corresponding ICD-9 code for colon cancer.

We have several standard exclusions for each of our measures that are similar to the NCQA exclusions for their relative resource use measures (active cancer [other than colon cancer], HIV/AIDS). We exclude individuals with high resource use and high cost conditions that would likely be systematically different from the majority of individuals included in the analysis. These individuals are excluded to create a more homogeneous population included in the analysis.

Several other diagnostic codes are included as related to the colon cancer episode. These include diagnosis codes for cancer, those associated with complications of the colectomy or complications of treatments following the colectomy (eg. chemotherapy), other complications that may be associated with cancer or the treatment of cancer, or symptoms that may be a result of the disease or its treatment.

The codes for the colectomy are included as related to the episode as these costs trigger someone for inclusion in the episode and are a major component of the treatment for patients with colon cancer. Many of the other procedure codes may be related to colon cancer during the measurement time frame; however the workgroup felt it was important to have an eligible ICD9 associated with these claims. The same is true for the radiology codes that the workgroup identified as potentially related to the colon cancer.

The codes for chemotherapy, antiemetics, and other medications commonly used in the treatment of patients with colon cancer are included regardless of the diagnosis code associated with these claims. The same is true for ostomy supplies which are related to the colectomy that was performed and directly related to the treatment of colon cancer.

Finally, a set of DRGs are also included to identify relevant hospitalizations that may not contain one of the included ICD-9 codes but still are for patients with colon cancer. The DRGs are directly for the treatment of patients with colon cancer.

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

See risk adjustment details—Section S10.1

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

We do not provide specifications for clinical hierarchies.
The only clinical hierarchies used in the measure are associated with the identification of comorbid conditions that are used in risk adjustment. Details are provided in Section 10.1 of this submission form and in the risk adjustment section of the technical appendix in the written measure specification. In short, we use the CMS hierarchical condition categories (HCC) for assignment of comorbid conditions which utilizes a hierarchy of codes based on the ICD-9 codes present during the pre-index period. We rely on the HCC system for identifying comorbid conditions in our risk adjustment procedure. The hierarchies are important for our risk adjustment as they are intended to identify different levels of severity of conditions that may be differentially associated with resource use. We used the HCC system because it is a previously developed and validated system for use in resource use measures.

Within our episode measure there are no hierarchies assigned to any of the codes.

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

We do not provide specifications for clinical severity levels.
The inability to account for stage of cancer is a limitation of the data available in most claims. It would be ideal to have information on stage as stage of disease is associated with differences in costs and outcomes. Unfortunately we are unable to account for this in existing databases. All patients are lumped together into a single colon cancer group.

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.

We do not provide specifications for concurrency of clinical events.
Each of the measures developed as part of the ABMS measure set was intended as a standalone measure. The measures were not designed to be combined into a single composite measure of resource use for providers. Because the focus during the development of these measures was there eventual pairing with quality measures, each of the measures is considered as a unique measure. Therefore, the concurrency of events and the fact that events may be counted in more than one measure is not an issue. We were not trying to account for the overall resource use of a population but rather focused on resource use within specific cohorts of patients. The relative resource information produced is intended to result in actionable information which is not possible when all of the episodes are combined into a single composite measure.

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: http://www.healthqualityalliance.org/hvhc-project/cost-care-measurement-development
Please supply the username and password:
Attachment:

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

The following sequence is used to construct the measures:
1. Eligible population identification
2. Identification of related resources
3. Assignment of standardized prices
4. Creation of episode specific strata (if applicable)

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

A 12 month time period is used to define the measurement period. The period of determining resource use should extend for the full 12 month period. The 12 months preceding the measurement period is used as the identification period. Therefore, a full contiguous 24 month period is required for implementation of the measure.

Patients undergoing colectomy are identified and the resource use and costs associated with colon cancer care in the 30 days before the procedure and the 11 months following the procedure are measured.

The following steps are used to complete the construction sequence (for specific codes, see Section S8.2 clinical framework of this submission form as well as the written measure specification/technical appendix accessed via URL).

ELIGIBLE POPULATION IDENTIFICATION

The process of identifying patients to be included in the measure is divided into three separate steps, each with multiple sub-steps. The following steps are used for identifying the included population:

Step 1: Identify patients that meet episode inclusion criteria

1. Identify patients 18-85 years during the measurement period

2. Patients will be included in the measure if they have a procedure code present in any field for colonoscopy during the measurement period (see Table CCTx-A) and an ICD-9 code for colon cancer (see Table CCTx-B).

Step 2: Identify patients that meet age, eligibility and continuous enrollment criteria

1. Eligibility
a. Identify benefits during both the identification year and the measurement year. To be included persons must have both of the following benefits in both years
i. Medical benefit
ii. Pharmacy benefit

2. Continuous enrollment
a. Determine enrollment during both the identification and measurement years. (To be eligible, persons must have both medical and pharmacy coverage for the measurement period and prior period (do not include persons whose pharmacy benefits are dropped partway through the identification or measurement period).
b. Identify (or estimate) total days of coverage in each year. (If precise information regarding persons' total days of coverage is not available, it is recommended that measure implementers estimate this information to the best of their ability using available data elements (e.g., monthly enrollment indicators).
c. To be eligible, persons must have at least 320 total days of coverage during each year

Step 3: Identify patients with exclusion criteria
1. Identify patients that meet one or more exclusion criteria during either the identification year OR the measurement year
a. Standard Exclusion Criteria (see Section S8.2 above orTables CCTx-I 1-4):
i. Active cancer (except colon cancer)
ii. End stage renal disease (ESRD)
iii. HIV/AIDS
iv. Organ transplant

b. Persons with a prior colectomy (see Section S8.2 above or Table CCTx-A) within the previous 12 months are excluded.

Step 4: Combine prior steps to identify measure population
1. Identify stable colon cancer eligible population
2. Exclude those patients not meeting general inclusion criteria (e.g., continuous eligibility)
3. Exclude those patients meeting one or more measure exclusion criteria
4. The resulting collection of patients is the measure population

ELIGIBLE EVENT IDENTIFICATION

For each individual in the measure population, identify the following paid claims for services rendered during the measurement period. Claims / encounters will be identified based on the presence of colon cancer-related diagnosis codes or procedure codes. These events will be used to determine the colon cancer-related resource use.

Inpatient hospitalization events

Referring to the codes listed in Section S8.2 above, identify all inpatient hospitalization events with one of the following diagnosis codes appearing in the primary diagnosis field (see also Table CCTx-C) or hospitalizations with an eligible colon cancer code (see also Tables CCTx-A, CCTx-B, CCTxH).

Outpatient events

Referring to the codes listed in Section S8.2 above, identify all outpatient claims / encounters with a colon cancer-related diagnostic code appearing in any position (see also Tables CCTx-A, CCTx-B, CCTx-C).

Procedures , laboratory and other services

Referring to the codes listed in Section S8.2 above, identify all claims / encounters with one of the following CPT, HCPCs, or ICD-9 procedure codes (see also Tables CCTx-E and CCTx-G).

Prescription drugs

Referring to the codes listed in Section S8.2 above, identify colon cancer related medications or medication-related services during the measurement period (see alsoTable CCTxF). These codes will be used to identify colon cancer-related services during the measurement period, regardless of corresponding ICD-9 codes.

ASSIGNMENT OF STANDARDIZED PRICES

Standardized prices are calculated for all of the components of care used to treat or manage the patient's condition to ensure that comparisons can be made solely on the basis of differential practice patterns and resource use. Three separate methodologies are used to derive these standardized prices: for inpatient facility charges, for ambulatory pharmacy charges (i.e., prescriptions dispensed outside the inpatient hospital setting), and for all other charges. These standardized prices are then applied to the claims identified as colon cancer-related. For further details, see section S10.3 below.

CREATION OF EPISODE-SPECIFIC STRATA

Patients included in the measure are stratified by receipt of chemotherapy during the 11 month post-colectomy measurement period. Assign patients into two groups--those that do and do not receive chemotherapy.

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

Patients undergoing colectomy are identified and the resource use and costs associated with colon cancer care in the 30 days before the procedure and the 11 months following the procedure are measured.

Rationale:
The clinical workgroup indicated that it is typical that the management of a new case of colon cancer could extend over a twelve month period. Moreover, an important measure of quality can be the one year survival rate of patients with colon cancer. Therefore, we measured the resources used over a 12 month period. The 30 days preceding the colectomy are included as part of the measure because there could be significant costs associated with the work-up leading to the colectomy and different paths before getting to the colectomy may be associated with different costs.

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

We do not provide specifications for measure redundancy or overlap.
The measures developed by ABMS REF were developed as standalone measures to address all relevant services associated with a particular health care condition. Collectively, the measures do not sum-up to a single total and there is the potential for overlap and redundancy to occur when multiple measures are applied simultaneously.

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

We do not provide specifications for linking complementary services.
All services included in the measure are included based on the presence of diagnosis codes, procedure codes, or

medications.
Services are identified based on presence of qualifying codes. There is no effort to link complementary services to the episode. The strategy for all of our measures was to rely on the presence of codes to qualify for inclusion in the episode rather than to make assumptions about temporal or other associations between events.

S9.6.Resource Use Service Categories

Inpatient services: Inpatient facility services
Inpatient services: Evaluation and management
Inpatient services: Procedures and surgeries
Inpatient services: Imaging and diagnostic
Inpatient services: Lab 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
Durable Medical Equipment (DME)

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.

At the claim line level, the user should identify all relevant codes specified in the clinical framework Section 8.2 above (see also written measure specification). For inpatient services, these include all relevant ICD9, DRG v24, DRGv25, CPT codes; for ambulatory services, these in clued all relevant ICD9, and CPT codes; for procedures and laboratory these include all relevant ICD9 procedure codes, HCPCs, and CPT codes, and for prescription drugs, these include relevant HCPCs and NDCs.

The above categories were selected because they represent the vast majority of resource use for the episode and the measure developers examined the distribution of costs between categories to evaluate the face validity of the measure. Developers also reasoned that resource use variation between providers by category would be informative. Please refer to Section S8.2 Clinical Framework for the algorithms used to identify/assign some services.

Measure developers also applied the Berenson-Eggers Types of Service (BETOS) system which categorizes all HCPCS codes into resource use areas (e.g. Evaluation and Management, Procedures, Imaging, etc). In addition to the BETOS category there is an additional category included for medications related resource use that is determined using pharmacy data and HCPCs.

Rationale: The BETOS classification system is a widely used, publically available system for classifying healthcare services. These categories can be used to examine cost patterns across providers to identify differences across the different categories of service. This system provides a sufficient number of categories to make meaningful comparisons across patterns of resource use and yet is not too broad so as not to be able to draw conclusions based on differences. Furthermore, identification of important differences allows users to drill down within those categories to identify cost drivers within BETOS categories that may ultimately provide actionable information for providers.

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

URL:
Please supply the username and password:
Attachment:

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
Hospital/Acute Care Facility
Imaging Facility
Laboratory
Pharmacy

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.

Calculation of risk adjusted costs (see also the risk adjustment section in the technical appendix of the written measure specification).

The model developed for comorbidity adjustment uses Hierarchical Condition Categories (HCC) to identify comorbidities. This reflects the risk adjustment methodology used by CMS and recently evaluated by NCQA for their Relative Resource Use (RRU) measures. However, there is an important distinction between the use of HCCs by CMS and the model evaluated by NCQA and the risk adjustment model used to estimate expected costs. The CMS and NCQA model use HCCs to adjust TOTAL costs of care, whereas this model focuses on episode-specific costs of care. Because models developed to adjust total costs of care may not reflect the expected costs for episode-specific resource use, new models were developed from a sample of commercially insured patients for risk adjustment. The following process was completed to develop the models:

1. Utilized quasi-Modified Delphi approach with the condition-specific workgroup to categorize HCCs into three groups:
- Include in risk adjustment model;
- Exclude in risk adjustment model; and
- Test impact in risk adjustment model.

2. Identified HCCs in denominator population during the 12 months preceding the measurement year.

3. Tested 12 different model specifications (see Table – RA1 in technical appendix of written measure specification), where the HCCs included in the model varied, and the distribution and link functions in the generalized linear models also varied. Models were developed in a stepwise manner as indicated. The first four models used a gamma distribution and a log link function. The first model included all HCCs identified by the condition-specific workgroup as "Include HCCs" with a prevalence in the population of >=1%. The second model was a reduction of the first model that only included HCCs where $p<0.1$. The third model extended the second model by including HCCs with prevalence >=1% identified as "Test HCCs" by the condition-specific workgroup. The fourth model was a reduction of the third model and included only those HCCs where $p<0.1$. The next set of four models (Models 5-8) repeated the process of the first four models but used a normal distribution and identity link function. Model 9 used all of the HCCs, with the exception of the HCC for the episode being evaluated (e.g., heart failure for the CHF post hospitalization episode), and a gamma distribution with log link function. Model 10 was a reduction of Model 9 where only the HCCs with $p<0.1$ were included. The final two models (Models 11-12) used the same process as Models 9 and 10 with a normal distribution and identity link function.

4. Models were developed in a split sample approach with 75% of the population randomly selected for model

development and the remaining 25% used in model evaluation. Model performance was also evaluated in the full cohort.

5. The performance of each model was evaluated through comparisons of the observed and predicted distributions, comparisons of residuals, comparisons of absolute differences between observed and predicted, comparisons of observed-to-predicted ratios, and comparisons of mean squared errors across models. Summary information on model performance was presented to the condition-specific workgroup for selection of a risk adjustment model for the condition. Final model selection was based on the best performing model across metrics. Where model performance was similar, models using the normal distribution were preferentially chosen over the gamma distribution models for ease of implementation. More parsimonious models were also preferentially chosen.

Generally, measure implementers have two choices when calculating risk adjusted costs. The first is to follow the process specified above to create risk adjustment models that are specific to their population and their dataset. The second option is to use the risk adjustment models created as part of this project. However, for colon cancer it will be necessary for risk adjustment models to be developed in future testing.

Comorbidity Adjustment Strategy Rationale:

We acknowledge that risk adjustment is an important part of the development of an episode of care measure. Risk adjustment is intended to account for variation in episode costs that are not due to differences in practice patterns but rather are due to differences in the case mix of patients. When reporting episode costs at the provider level, risk adjustment attempts to account for differences in the case mix of patients across providers and minimizes the assertion that one providers patients are sicker than the comparator patients. An additional advantage of episode-based measurement is that focusing on costs related to care only for that episode may be a form of risk adjustment because we are not looking at the overall healthcare costs of the patients. Our risk adjustment strategy was not to attempt to account for all of the variation within an episode; however we want to be able to control for resource use variation that is attributed to the episode that may result from differences in patient case mix.

We selected to use Hierarchical Condition Categories (HCC) as our primary strategy for identification of comoribid conditions and for risk adjustment. We selected HCCs because of their use in risk adjustment methodology used by CMS and recently evaluated by NCQA for their Relative Resource Use (RRU) measures. We felt that many users of our episodes would be familiar with HCCs and the use of these measures in administrative data. Moreover, the analytic programmers for generating HCCs are freely available on the CMS website and therefore we mitigate issues of access to code for creating the risk adjustment groups.

While we use HCC as the starting point for our risk adjustment models, there is an important distinction between the use of HCCs by CMS and the model evaluated by NCQA and our episode definitions. The CMS and NCQA model use HCCs to adjust for TOTAL costs of care whereas, we are focused on the episode-specific costs of care. Briefly, NCQA has created weights for each of the HCCs on total costs of care using data from a large population that has one of the conditions in their RRU measure. These weights can then be applied to different populations to adjust for the presence of comorbid conditions when estimating total costs. The primary concern with applying the adjustment factors available from either CMS or NCQA are the fact they are total costs and not related to the episode-specific costs of care. This would lead to very different risk adjustment models that would not account for as much of the variability within the episode as a risk adjustment model focused on episode-specific costs. We compared the use of the 'off the shelf' HCC values with a risk adjustment model developed specifically for our episode.

See attached supplemental document for illustrative example of comparison of "off the shelf" HCC values to the risk adjustment model developed specifically for our episode (note: diabetes is used for purposes of illustration).

Given the disparity in the means and distributions of the off the shelf HCC values, we felt this justified our approach to develop risk adjustment models for each of our episodes that were focused on episode specific costs.

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: 10.1_Risk adjustment method-634350316770649465.pdf

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

Patients included in the measure will be stratified by receipt of chemotherapy during the 11 month post-colectomy measurement period. Patients will be divided into those that do and do not receive chemotherapy.

Rationale:
Treatment decisions related to colon cancer care may vary widely, at least in part due to variation in the stage of the cancer and patient preference. The potential range of resource use associated with these decisions may be quite wide. One of the important treatment options that can impact the relative resource use is treatment with chemotherapy. Therefore, to create more comparable groups of patients in the measure, the episode is stratified into those that do and do not receive chemotherapy.

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.

Standardized prices are calculated for all of the components of care used to treat or manage the patient's condition to ensure that comparisons can be made solely on the basis of differential practice patterns and resource use. Three separate methodologies are used to derive these standardized prices: for inpatient facility charges, for ambulatory pharmacy charges (i.e., prescriptions dispensed outside the inpatient hospital setting), and for all other charges. These standardized prices are then applied to the claims identified as related.

Standard Cost Calculation

Step 1 Identify all claims paid for services rendered during the measurement period and with positive non-zero paid amounts for all patients, regardless as to whether they have been included in the measure population (rejected or unadjudicated claims should be dropped). Categorize these claims as follows (in accordance with the BETOS classification process):
- Inpatient Facility (services provided by a facility during an acute inpatient hospital stay, standard price includes room and board and ancillary services)
- Ambulatory Pharmacy (ambulatory prescriptions included in a member's pharmacy benefit)
- All other (E&M, procedures, imaging, tests, DME, other, and exceptions/unclassified)

Step 2 For each category identified, compute standardized prices. Refer to each service category's instructions (i.e., Calculating Standard Units of Service and Total Standard Cost) below.
Step 3 Combine standardized prices with eligible events (e.g., through a file merge as specified in each service category's instructions).
Step 4 For each individual claim, multiply the standardized price by the number of service units identified on the claim to determine the full cost of the service, hospitalization, or prescription.

Calculating Standard Units of Service and Total Standard Cost: Inpatient Facility

For inpatient facility costs, standardized prices are developed at the diagnosis-related group (DRG) level and – for those hospitalizations where DRG-level information is unavailable – at the ADSC level. Each is adjusted for length-of-stay (LOS) so as to more closely mirror the payment systems typically applied among commercial health plans. Both approaches use RRU HEDIS standardized daily price tables developed by NCQA. All inpatient facility costs are considered "acute" for this analysis.

Step 1 Identify all inpatient stays that occurred during the measurement period. Include stays that may have started before the measurement period or ended after the close of the measurement period. Define a single, unique record describing the member's inpatient stay.

Step 2. Identify the primary discharge DRG. Also identify the DRG version (e.g., CMS-DRG vs. MS-DRG). Care must be taken in using the standardized price tables (specified below) to insure the data and the tables use the same DRG version.
Step 3 Compute the stay's total LOS in days, using paid or expected-to-be-paid days only. Include all paid days in the LOS calculation, whether or not they fall outside the measurement period. Also identify the stay's LOS group based on the stay's LOS and the information below.

LOS (Days)	LOS GRP
1	A
2	B
3-4	C
5-6	D
7-8	E
9-15	F
16 or more	G

Step 4 Compute the LOS per diem multiplier. If the inpatient stay falls completely within the measurement period, use the total number of paid days as the per diem multiplier. If the inpatient stay does not fall completely inside the measurement period, count only the days within the measurement period (including the last day of the period) to compute the per diem multiplier.

Step 5 Download the HEDIS RRU standardized daily price tables from the NCQA website (http://www.ncqa.org/tabid/1092/Default.aspx) for the corresponding measurement periods. Note that there is a one period lag in the file and data periods (i.e. files designated 2007 are based on 2006 data). Some periods may have two sets of tables if there is a significant change in DRG versions. Note: The project staff worked in collaboration with NCQA in development of this methodology for purposes of testing the initial set of measures. Users of the measures may wish to implement their own methodology that does not rely on a price list from NCQA.

Step 6 Calculate the DRG-specific per-diem payment rate by adjusting the standard daily prices for inflation to a reference period using the medical care component of the Consumer Price Index (CPI).

Step 7 Combine DRG-specific per-diem payment rates with the dataset containing eligible inpatient hospital events for the measure. For each event, multiply the per-diem payment rate by the event's LOS per diem multiplier to determine the event's total standard cost.
Total standard costs will not be computed using this approach for stays that have not been assigned a DRG, and for DRGs that are not assigned a standard price by HEDIS. These stays will be assigned a standard price using the ADSC method described below. (Note: Figures presented in this example are arbitrary and do not reflect any particular dataset or patient. Additionally, the DRG XXX is intended to be used as an illustrative example for calculating inpatient costs. Only DRGs related to the episode should be included in this calculation).

Example:

Assume the calculated DRG-specific per-diem payment rate for DRG XXX for FY 2007 is $900.17. An eligible member had an inpatient stay with the following characteristics:
- A principal diagnosis with an eligible ICD-9 code
- A DRG of XXX (DRG associated with an eligible inpatient stay for the episode)
- Date of admission of February 2, 2007 and date of discharge of February 9, 2007 (fiscal period 2007)
- A LOS of 8 days, and therefore a LOS per diem multiplier of 8 days

This event has a calculated total standard cost of $900.17 x 8 = $7,201.36.

Example:

Again assume the calculated DRG-specific per-diem payment rate for DRG XXX for FY 2007 is $900.17. An eligible member had an inpatient stay with the following characteristics:
- A principal diagnosis with an eligible ICD-9 code
- A DRG of XXX (DRG associated with an eligible inpatient stay for the episode)
- Date of admission of December 28, 2006 and date of discharge of January 2, 2007 (fiscal period 2007)
- A LOS of 6 days, and a LOS per diem multiplier of 2 days (January 1-2).

This event has a calculated total standard cost of $900.17 x 2 = $1,800.34.

Step 8 If DRG information is not available for a given inpatient hospitalization a method must be used that assigns prices to those hospitalizations. The methodology used in testing the initial development of the measures was to assign an Aggregate Diagnostic Service Category (ADSC) for the stay using the principal discharge diagnosis. To assign ADSC, download the ADSC Table (Table SPT-INP-ADSC) from the NCQA Web site (http://www.ncqa.org/tabid/1092/Default.aspx) and match the principal ICD-9-CM Diagnosis code from the discharge claim to an ADSC. If the claim does not contain a DRG and the primary ICD-9-CM Diagnosis code is invalid or missing, map the inpatient stay to the ADSC Table's MISA category. An alternative would be to create average prices from the dataset the measures are being implemented for each of the ADSC categories and discharge ICD-9-CM codes and assign those prices to missing hospitalizations.

Step 9 Determine if the member underwent major surgery during the inpatient stay. If this information is not available within the dataset, this may be determined using the list of codes included in a table from the NCQA Web site (Maj-Surg Table). Flag eligible members if one procedure code in the Maj-Surg-Table is present from any provider during the time period defined by the admission and discharge dates.

Step 10 Match each ADSC, LOS per diem multiplier, and major surgery flag assignment for the stay to a value in the Table SPT-INP-ADSC to obtain the assigned standard price. For each event, multiply the per-diem payment rate by the event's LOS per diem multiplier to determine the event's total standard cost. As with the DRG method, the ADSC standard prices must be adjusted for inflation to a reference period using the CPI. Between this ADSC methodology and the previously described DRG-based methodology, each inpatient hospital stay should now have an associated standardized price.

Example:

An eligible member had an inpatient stay with the following characteristics:
- A principal diagnosis for an eligible event assigned to ADSC category Respiratory-C (RESC)
- No available valid DRG information
- Date of admission of February 2, 2007 and date of discharge of February 9, 2007
- A LOS of 8 days, and therefore LOS group E
- A major surgery event during the stay

Using Sample Table SPT-INP-ADSC, we determine this event has a standard per-diem payment rate of $1,474.00. Therefore this event has a calculated total standard cost of $1,474 x 8 = $11,792.

Calculating Standard Units of Service and Total Standard Cost: Ambulatory Pharmacy

For ambulatory pharmacy-related costs, standardized prices are developed at the NDC level, adjusted for days supply.

Step 1 Identify all pharmacy services that occurred during the measurement period. The following pharmacy services should also be included:
- Prescriptions that may have been dispensed before the measurement period and had days supply that extended into the measurement period (e.g., a prescription with a dispensed date of December 15, 2007 and 30 days supply would extend 13 days into the measurement period beginning January 1, 2008)
- Prescriptions that may have been dispensed during the measurement period and had days supply that extended into the following period (e.g., a prescription with a dispensed date of December 20, 2008).

Define a single, unique record describing the pharmacy service.
Step 2 Identify the NDC code and the days supply for each prescription, whether or not some days fall outside the measurement period.
If the days supply is not available for a given pharmacy claim, set the claim's standard cost to be equal to its listed payment amount.
Step 3 Compute the days supply per diem multiplier. If the prescription's days supply fall completely within the measurement period, use the claim's listed days supply as the per diem multiplier. If the prescription's days supply do not fall completely inside the measurement period, count only the days within the measurement period (including the last day of the period) to compute the per diem multiplier.
Step 4 For each NDC, calculate the total NDC-specific payments and the total days supply across all pharmacy claims within that NDC during the measurement period. Using these totals, calculate NDC-specific per-day-supply payment

rates by dividing total NDC-specific payments by total days supply for each NDC.
Step 5 Combine NDC-specific per-day-supply payment rates with the dataset containing eligible pharmacy events for the measure. For each event, multiply the per-day-supply payment rate by the event's days supply per diem multiplier to determine the event's total standard cost.

Calculating Standard Units of Service and Total Standard Cost: All Other

For all non-inpatient hospital, non-pharmacy costs, standardized prices are developed at the procedure code and modifier level.

Step 1 Identify all non-inpatient hospital, non-pharmacy services that occurred during the measurement period.
Step 2 Identify the primary procedure code (CPT, HCPCs, ICD-9, etc.) and the first modifier code for each service.
Step 3 For each procedure-modifier combination, calculate the total procedure/modifier-specific payments across all non-inpatient-hospital, non-pharmacy claims with that procedure-modifier combination as well as the frequency of the procedure-modifier combination during the measurement period. Calculate procedure/modifier-specific payment rates by dividing total procedure/modifier-specific payments by the frequency for each procedure-modifier combination.

Example:
Assume that there are 3 non-inpatient-hospital, non-pharmacy claims during the measurement period with the following characteristics:
Patient: 1111, Procedure (CPT-4): 71010, Modifier: Date: 2/1/2007, Payment: $21
Patient: 1111, Procedure (CPT-4): 72240, Modifier: TC, Date: 2/18/2007, Payment: $90
Patient: 2222, Procedure (CPT-4): 71010, Modifier: Date: 1/5/2007, Payment: $25

For the procedure/modifier combination: 71010
The total payment is $21 + $25 = $46
The total frequency is 2
Therefore the procedure/modifier-specific payment rate is $46/2 = $23
For the procedure/modifier combination: 72240/TC
The total payment is $90
The total frequency is 1
Therefore the procedure/modifier-specific payment rate is $90/1 = $90

Step 4 Combine procedure/modifier-specific payment rates with the dataset containing eligible non-inpatient-hospital, non-pharmacy events for the measure so that each procedure-modifier combination is paired with its corresponding payment rate. This payment rate is the event's total standard cost.

Calculation of total individual episode costs

The resource use identified as diabetes-related– and to which standardized prices have been applied (i.e., the collection of eligible events) – is used to calculate individual level episode costs. The following steps are used in the calculation of total individual level costs.

Step 1: For each individual included in the episode, sum all of the total standard costs linked to diabetes-related events occurring during the measurement period at the BETOS service category level. This will provide an estimate of the costs of each category of service over the measurement period.

Step 2: For each individual in the episode, sum ALL total standard costs linked to diabetes-related events to calculate TOTAL episode costs.

Step 3: Exclude individuals that do not have positive, non-zero costs (e.g. outpatient visit, hospitalization, medication use) during the measurement period.

Rationale for costing method

We used standardized prices to estimate the costs for all components of care in the claims data that a patient received data during the measurement period. Because costs in claims data reflect both the quantity and mix of services delivered as well as the prices paid for those services, some of the cost variation is due to price differences across providers

(Thomas et al., 2005). Variations in cost data among organizations and over time can obscure real cost differences (Ritzwoller, et al., 2004) and impede comparisons across providers. To ensure that comparisons are made on the basis of differences in practice patterns and resource use, we developed standardized prices, such that a given service would have the same price across all providers (Thomas et al., 2005). We used separate methods to estimate standardized price that were used to calculate for inpatient facility costs, pharmacy costs, and cost for all other care.

For the inpatient facility use, we developed standardized prices using diagnosis-related group (DRG) information. For hospitalizations without DRG-level information, we used aggregate diagnostic service category (ADSC) level information. In each case, we adjusted for length-of-stay (LOS) during the measurement period so as to more closely mirror the payment systems typically applied among commercial health plans. Both approaches use relative resource use (RRU) HEDIS standardized daily price tables developed by NCQA. We worked in collaboration with NCQA in development of this methodology; however, users of the measure may need to implement their own methodology that does not rely on a price list from NCQA.

For pharmacy use, we determined the days supply for each medication that was dispensed during the measurement period identified by a unique national drug code (NDC). We calculated a standardized price per diem for each NDC in our data by dividing the total payments in the claims data by the total days supply in the claims data for that NDC. We then estimated patient's pharmacy costs by multiplying the standardized price per diem for each NDC by the patient's days supply during the measurement period for that NDC. Standardized prices for pharmacy was estimated using this approach rather than an average whole price (AWP) because the AWP is not defined by law or regulation and does not reflect discounts obtained by most purchasers. As a result, the ultimate price paid by purchasers is often significantly lower than the AWP (Pereira, 2005).
For all other use, we identify the primary procedure code (CPT, HCPCs, ICD-9, etc.) and the first modifier code for each service. We calculated a standardized price for each procedure/modifier by dividing the total procedure/modifier-specific payments by the frequency for each procedure/modifier combination in the claims data. We then applied this standardized price to each patient's procedure/modifier combination that occurred during the measurement period. This approach allowed for a consistent methodology to be applied to each procedure/modifier combination in the claims data to achieve the same price for a service across all providers.

References:
Pereira BJG. Medicare Prescription Drug, Improvement and Modernization Act: Average Wholesale Price (AWP) Medscape Nephrology.2005;2(1)

Ritzwoller DP, Goodman MJ, Maciosek MV, Lafata JE, Meenan R, Hornbrook MC, Fishman PA. Creating Standard Cost Measures Across Integrated Health Care Delivery Systems. J Natl Cancer Inst Monogr 2005;35:80 – 87

Thomas JW, Grazier KL, Ward K. Economic Profiling of Primary Care Physicians: Consistency among Risk-Adjusted Measures. Health Services Research. 2004;39(4):985- 1004

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.

The level of measurement and attribution is dependent upon the stratum of the patient. For those without chemotherapy, resource use is attributed to the surgeon. For patients in the chemotherapy strata, resource use through the first 6 weeks following colectomy is attributed to the surgeon. Resource use from day 43 following colectomy to the end of the measurement period is attributed to the oncologist with the plurality of E&M codes for the patient. The following codes E & M codes must also contain an eligible ICD-9 code to be considered for purposes of determining

attribution (see also Table CCTx-D in written measure specification): New Patient - Office Or Other Outpatient Visit – Focused: CPT: 99201; New Patient - Office Or Other Outpatient Visit - Expanded Focused: CPT: 99202; New Patient - Office Or Other Outpatient Visit – Detailed: CPT: 99203; New Patient - Office Or Other Outpatient Visit - Comprehensive -Moderate Complexity: CPT: 99204; New Patient - Office Or Other Outpatient Visit - Comprehensive - High Complexity: CPT: 99205; Established Patient - Office Or Other Outpatient Visit – Minimal: CPT: 99211; Established Patient - Office Or Other Outpatient Visit – Focused: CPT: 99212; Established Patient - Office Or Other Outpatient Visit - Expanded Focused: CPT: 99213; Established Patient - Office Or Other Outpatient Visit – Detailed: CPT: 99214; Established Patient - Office Or Other Outpatient Visit – Comprehensive: CPT: 99215; Hospital Observation - Observation Care Discharge: CPT: 99217; Initial Observation Care - Detailed Or Comprehensive - Low Complexity: CPT: 99218; Initial Observation Care - Detailed Or Comprehensive - Moderate Complexity: CPT: 99219; Initial Observation Care - Detailed Or Comprehensive - High Complexity: CPT: 99220; Initial Hospital Care - Low Complexity: CPT: 99221; Initial Hospital Care - Moderate Complexity: CPT: 99222; Initial Hospital Care - High Complexity: CPT: 99223; Subsequent Hospital Care - Low Complexity: CPT: 99231; Subsequent Hospital Care - Moderate Complexity: CPT: 99232; Subsequent Hospital Care - High Complexity: CPT: 99233; Observation Or Inpatient Hospital Care - Low Complexity: CPT: 99234; Observation Or Inpatient Hospital Care - Moderate Complexity: CPT: 99235; Observation Or Inpatient Hospital Care - High Complexity: CPT: 99236; Hospital Discharge Day Management - Less Than 30 Minutes: CPT: 99238; Hospital Discharge Day Management - Greater Than 30 Minutes: CPT: 99239; Office Consultation - Problem Focused – Straightforward: CPT: 99241; Office Consultation - Expanded Problem Focused – Straightforward: CPT: 99242; Office Consultation - Detailed History - Low Complexity: CPT: 99243; Office Consultation - Comprehensive History - Moderate Complexity: CPT: 99244; Office Consultation - Comprehensive History - High Complexity: CPT: 99245; Inpatient Consultation - Problem Focused – Straightforward: CPT: 99251; Inpatient Consultation - Expanded Problem Focused – Straightforward: CPT: 99252; Inpatient Consultation - Detailed History - Low Complexity: CPT: 99253; Inpatient Consultation - Comprehensive History - Moderate Complexity: CPT: 99254; Inpatient Consultation - Comprehensive History - High Complexity: CPT: 99255; Emergency Department Visit - Problem Focused – Straightforward: CPT: 99281; Emergency Department Visit - Expanded Problem Focused - Low Complexity: CPT: 99282; Emergency Department Visit - Expanded Problem Focused - Moderate Complexity: CPT: 99283; Emergency Department Visit - Detailed History - Moderate Complexity: CPT: 99284; Emergency Department Visit - Comprehensive History - High Complexity: CPT: 99285; Home Visit For An Established Patient - Comprehensive - Moderate To High Complexity: CPT: 99350; Prolonged Physician Service - Outpatient - Direct Patient Contact: CPT: 99354; Prolonged Physician Service - Outpatient - Direct Patient Contact - Additional 30 Minutes: CPT: 99355; Prolonged Physician Service - Inpatient - Direct Patient Contact: CPT: 99356; Prolonged Physician Service - Inpatient - Direct Patient Contact - Additional 30 Minutes: CPT: 99357; Prolonged Evaluation And Management Service - Before And After Direct Patientcontact: CPT: 99358; Prolonged Evaluation And Management Service - Before And After Direct Patient Contact - Additional 30 Minutes: CPT: 99359; Physician Standby Service - Requiring Prolonged Attendance: CPT: 99360; Medical Team Conference - Interdisciplinary - Direct Patient Contact: CPT: 99366; Medical Team Conference - Interdisciplinary - Without Direct Patient Contact: CPT: 99367: CPT: Physician Supervision Of Patient Under Home Health Agency Care: CPT: 99374; Physician Supervision Of Patient Under Home Health Agency Care - More Than 30 Minutes: CPT: 99375; Physician Supervision Of Hospice Patient: CPT: 99377; Physician Supervision Of Hospice Patient - More Than 30 Minutes: CPT: 99378; Physician Supervision Of Nursing Facility Patient – Complex: CPT: 99379; Physician Supervision Of Nursing Facility Patient - Complex - More Than 30 Minutes: CPT: 99380; Telephone Evaluation And Management To An Established Patient - 5-10 Minutes: CPT: 99441; Telephone Evaluation And Management To An Established Patient - 11-20 Minutes: CPT: 99442; Telephone Evaluation And Management To An Established Patient - 21-30 Minutes: CPT: 99443; Online Evaluation And Management To An Established Patient: CPT: 99444.

The measure will also be summarized at system and regional levels.

Rationale:

The level of measurement and attribution is dependent upon the stratum of the patient. For those without chemotherapy, the totality of resource use is attributed to the surgeon that performs the colectomy. For patients in the chemotherapy strata, resource use through the first 6 weeks following colectomy is attributed to the surgeon. Resource use from day 43 following the colectomy to the end of the measurement period is attributed to the oncologist with the plurality of E&M visits for the patient. The time period for attributing care to the oncologist for those with chemotherapy was based on the period in which the risk for complications resulting from the colectomy has passed and the majority of the colon cancer care would be managed by the medical oncologist. In addition to examining resource use at this level and because of our inability to identify the stage of cancer at diagnosis, the measure will also be summarized at system and

regional levels.

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 : The peer groups in this episode consistent of two types of providers. Costs are attributed to surgeons and oncologists. These types of providers are only compared within specialty so surgeons are only compared to surgeons. Resource use from day 43 following the colectomy to the end of the measurement period is attributed to the oncologist with the plurality of E&M visits for the patient.

Other peer groups can include region and state as these measures can be compared at levels above individual physicians.

Rationale:

Focusing on comparing physicians of the same specialty is another mechanism to ensure the severity of patients is similar across providers. In addition, the providers being attributed care have differential time for resource use during the follow-up period and therefore it is not an equal comparison to compare across provider specialty.

Comparisons at these state and regional levels are actually preferred because of concerns about differences in case mix of patients for individual providers.

S11.3. Level of Analysis:

Clinician : Individual

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 : For the physician reports, total observed episode costs are winsorized at the 2nd and 98th percentile, but claim line outliers are not removed and the use of risk adjusted results are intended to correct for any extreme outliers. The only exception is inpatient admissions. Extremely high admissions costs are winsorized at the 99th percentile (i.e. any value higher than the 99th percentile are set to the 99th percentile cost).

Rationale: Winsorizing and risk adjustment limits the influence of outliers. Episodes with extremely high admission costs skews mean costs for the entire episode. Winsorizing admissions at the 99th percentile reduces this effect without eliminating information on the distribution of total episode costs.

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

We do not provide specifications or guidelines for sample size requirements : The ABMS REF episode-based resource use measures do not randomly sample enrollees nor do we recommend that implementers construct measures from a random sample. Regarding the issue of sample size determination. It is well known that the nature of resource use measurement at the level of individual providers will often lead to unstable estimations. There have been a number of efforts to derive a single number for which such measures might be stable enough for comparison of providers or individual providers over time. Yet to date there is no commonly accepted minimum. At this time we have not attempted to derive a minimal sample size for measure use.

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

Guidelines : Creation of provider summaries
The provider summaries are a report of the resource use for an attributable unit (hospital or provider) compared to their peer group, their non-peer group and all episodes in the dataset. Creation of the provider summaries uses the summary episode costs combined with the attributable provider data and the risk adjusted episode costs.

Step 1: Create a dataset that includes the following information: patient ID, total episode cost, attributable provider ID (or ID for the attributable unit if at the hospital level), attributable provider specialty type and episode expected costs from the risk adjustment model.

Step 2: Calculate the observed-to-expected ratio for each of the episodes by dividing observed costs for the episode by expected (predicted) costs for the episode.

O-to-E = Sum of Observed Costs / Expected Costs from Risk Adjustment Model

Step 3: If applicable, create indicators for the strata the episodes fall into so that separate summaries can be created for each of the strata.

Step 4: Summarize the observed, expected and observed-to-expected ratio for each attributable provider. Report minimum, maximum, median and mean values of the observed-to-expected ratio for all episodes attributed to the provider.

Step 5: Summarize the observed, expected and observed-to-expected ratio for each provider type, overall, and within each strata (if applicable). Report summary statistics for each of the provider types so the data are summarized for all providers of the same type. For example, report the summary statistics for the observed-to-expected ratio for all of the family practice physicians to facilitate peer group comparisons.

Step 6: Summarize the observed, expected, and observed-to-expected ratio for all of the episodes.

Step 7: For each of the individual attributable units (hospital or provider), determine the proportion of O-to-E ratios that are greater than or equal to the 75th percentile of the O-to-E ratio for the peer group. Calculate the 95% confidence interval for the proportion. For example, if the provider for which summary statistics are being calculated is a general internist and it is Dr. Y, the 75th percentile of O-to-E ratios for all episodes attributable to general interests is determined. The proportion of Dr. Y´s O-to-E ratio that are above the 75th percentile for all general interest episodes is determined and a 95% confidence interval is calculated for that proportion.

Step 8: Create provider summary reports for each attributable provider in the dataset

S12.Type of Score:

Ratio

If available, please provide a sample report:

S12_sample score report-634387008193466352.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 summary score calculated for the measure is the ratio of the observed cost to the expected cost or the O-to-E ratio. The O-to-E ratio is calculated for each patient for the attributable provider and summary statistics are calculated for the O-to-E ratio. The O-to-E ratio provides an estimate of the observed cost for a patient to the expected cost based on the patient's mix of chronic conditions. Expected costs for each patient are the calculation of their risk adjusted costs. A value of 1 for the O-to-E ratio indicates that the observed costs are equal to the expected costs. A value greater than 1 indicates that observed costs are more than what would be expected based on the patient's mix of chronic conditions. A value less than 1 indicates that the observed costs are less than what would be expected based on the patient's mix of chronic conditions. Calculation of the O-to-E ratio incorporates our approach to risk adjustment by determining the expected costs from the risk adjustment model. A summary O-to-E ratio is calculated for each of the attributable providers which combines all the episodes for that provider. Summary statistics are calculated for each provider for the raw (unadjusted) costs for the episode, expected costs and the O-to-E ratio. Each summary measure includes minimum, maximum, median, and mean values.

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

Creation of provider summaries
The provider summaries are a report of the resource use for an attributable unit (hospital or provider) compared to their peer group, their non-peer group and all episodes in the dataset. Creation of the provider summaries uses the summary episode costs combined with the attributable provider data and the risk adjusted episode costs.

Step 1: Create a dataset that includes the following information: patient ID, total episode cost, attributable provider ID (or ID for the attributable unit if at the hospital level), attributable provider specialty type and episode expected costs from the risk adjustment model.

Step 2: Calculate the observed-to-expected ratio for each of the episodes by dividing observed costs for the episode by expected (predicted) costs for the episode.

O-to-E = Sum of Observed Costs / Expected Costs from Risk Adjustment Model

Step 3: If applicable, create indicators for the strata the episodes fall into so that separate summaries can be created for each of the strata.
Step 4: Summarize the observed, expected and observed-to-expected ratio for each attributable provider. Report minimum, maximum, median and mean values of the observed-to-expected ratio for all episodes attributed to the provider.

Step 5: Summarize the observed, expected and observed-to-expected ratio for each provider type, overall, and within each strata (if applicable). Report summary statistics for each of the provider types so the data are summarized for all providers of the same type. For example, report the summary statistics for the observed-to-expected ratio for all of the family practice physicians to facilitate peer group comparisons.

Step 6: Summarize the observed, expected, and observed-to-expected ratio for all of the episodes.
Step 7: For each of the individual attributable units (hospital or provider), determine the proportion of O-to-E ratios that are greater than or equal to the 75th percentile of the O-to-E ratio for the peer group. Calculate the 95% confidence interval for the proportion. For example, if the provider for which summary statistics are being calculated is a general internist and it is Dr. Y, the 75th percentile of O-to-E ratios for all episodes attributable to general interests is determined. The proportion of Dr. Y´s O-to-E ratio that are above the 75th percentile for all general interest episodes is determined and a 95% confidence interval is calculated for that proportion.
Step 8: Create provider summary reports for each attributable provider in the dataset

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

Summary reports are generated at the attribution level that includes a summary estimate for the provider or hospital, the peer group, the non-peer group and the overall summary for the episode in the entire population. For each attributable provider / hospital the observed, expected and O-to-E ratio are summarized. The summaries are created to facilitate comparisons for the attributable provider or hospital with other providers in the same peer group and overall. The most meaningful comparisons are likely those between the provider or hospital and the peer group. Even though the results are risk adjusted, this may help to further balance the case mix or severity of the patients being compared. The summary statistics for the O-to-E ratios can be compared in order to provide a sense of the relative performance of the provider or hospital compared to peers. In addition, the proportion of O-to-E ratios about thresholds of 2.0 and 2.5 are provided for comparisons. Finally, for the attributable unit (hospital or provider) the proportion of O-to-E ratios that are greater than or equal to the 75th percentile of the O-to-E ratio for the peer group is determined and the 95% confidence interval calculated. The expectation would be that 25% of the estimates for the attributable provider would fall about this value if the distribution of O-to-E ratios is similar to the peer group. A statistically significant difference would be found between the groups if the 95% confidence interval did not include 25% in the range. For example, if the proportion at or above the 75th percentile of the peer group is 38% and the 95% confidence interval ranges from 28% to 48% than this provider would have significantly more O-to-E ratios at the upper end of the distribution than the peer providers. Alternatively, if the proportion at or above the 75th percentile was 8% and the 95% confidence interval ranged from 3% to 16% then the provider would have significantly fewer O-to-E ratios in the upper end of the distribution than the peer group. The 75th percentile in our testing was selected as an illustrative cut-point and it will be important to evaluate this

threshold for comparing providers.	

TESTING/ANALYSIS	Eval Rating
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.	
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 Colon Cancer.pdf	
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)* Thomson Reuter´s Marketscan Dataset was used in the testing of the ABMS REF episode-based resource use measures. The MarketScan Commercial Database provides a rich, comprehensive source of longitudinal administrative claims data, offering the largest convenience sample available in proprietary databases with over 30 million covered lives in each of the three most current years of data. The MarketScan Commercial Claims and Encounters (Commercial) Database is constructed from data contributed from over 100 medium and large size employers and health plans, representing over 130 unique carriers. The MarketScan Databases' large sample size constitutes a nationally representative data sample of the U.S. population under the age of 65 with employer-sponsored health insurance. The stability of MarketScan data sources provides superior continuity of patients over multiple years, generally longer than other claims databases because the majority of the MarketScan data are sourced from large employers. As long as individuals remain with the same employer, they can be tracked across health plans. Features of the MarketScan Research Databases include: • Fully paid and adjudicated claims including inpatient, outpatient, and prescription drug claims • Complete payment/charge information, including amount of patient responsibility • Validated diagnosis, procedure, and other standard codes on claims where applicable (CPT, ICD-9, DRG, NDC, etc) • Demographic information on enrollees including age, gender, and geographic information (three-digit zip codes and MSA) • Plan-type identifiers in the database include major medical, comprehensive, PPO, EPO, HMO, consumer-driven health plan, capitated or part-capitated POS and non capitated POS • Standardized data elements and definitions, ensuring accurate comparisons • Clinical data enhancements, such as Therapeutic Class and Generic Product Identifiers on drug records, and Major Diagnostic Categories and Diagnosis Related Groups on inpatient and outpatient records • Case records linking all of the hospital, physician, and ancillary services provided during an inpatient stay, allowing for comparisons based on such statistics as average length of stay, cost per admission, etc. These data reflect the real world of treatment patterns and costs by tracking millions of patients as they travel through	**2a2** **H☐** **M☐** **L☐** **I☐**

the healthcare system, offering detailed information about all aspects of care. Data from individual patients are integrated from all providers of care, maintaining all healthcare utilization and cost record connections at the patient level.

SA1.2. Analytic Methods
(Describe method of reliability testing and rationale)

The iterative development process that was employed in defining the episode of care resulted in episode measures being examined and modified several different times. As the workgroup would suggest changes to the specifications, modifications would be made in the programming language to reflect these changes. This would allow us to examine the reliability of our implementation of the episode measures as we would not anticipate large changes in the observed costs with only small changes in the logic of the episode measure. For example, if we added a new diagnosis code to our episode that only had a small number of associated claims in our Level 1 analysis we would not expect large changes in the overall cost of the episode. Conversely, if large changes were made in the logic of the episode we would expect similar changes in the overall resource use and cost. In addition, our focus on defining condition specific episodes that are not intended for combining into a single composite measure could result in improved reliability relative combining condition episodes into a single profile for a provider where reliability of physician profiling was wide ranging (Adams et al. NEJM 2010)

Citation: Adams JL, Mehrota A, Thomas JW, McGlynn EA. Physician cost profiling – reliability and risk of misclassification. N Engl J Med 2010;362:1014-1021.

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

The iterative modification of measure specifications resulted in several runs of the episode programming. Comparisons between results showed expected changes in overall resource use. The addition of a new diagnosis code that was previously included as unrelated but only had a minimal number of claims associated with it did not change the overall results associated with the episode.

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

We were able to produce consistent results within the episode.

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)

See section SA1.1 for description of Thomson Reuters Marketscan dataset.

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

The iterative process of developing the specification with the clinical workgroup represented as assessment of the face validity of the results. Summary findings from the specifications would be presented to the workgroup to determine if results met their expectations or if there were modifications that were necessary. Specifically, the workgroup would assess whether the type of care being included in the measure would make sense in terms of the clinical condition. Moreover, the most frequently and highest cost services that were not related to the episode but were appearing in the data would also be examined. If there were services in this grouping that belonged in the related list modifications would be made. This was facilitated by the Level 1 and Level 2 testing that was done as part of the measure evaluation process.

Validity testing focused primarily on face validity. Initial testing included:
Level 1 analyses

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o Examined impact of inclusion/exclusion criteria on episode denominator
o Examined total episode spending by type of service
o Identified top 20 "condition-related" and "non-condition-related" E&M, procedures, imaging, tests, inpatient admissions (by ICD-9 and DRG) and drugs, by service counts and dollar volume
o Tested proposed attribution logic, examined variability in per-episode resource use at individual provider level (as relevant) and by provider specialty.

Level 2 analyses
o Incorporated risk adjustment

o Produced sample physician-level reports in which observed-to-expected ratios are computed and the distribution of each physician's episodes is compared to the peer group's distribution.
o Examined specific drivers of resource use variation
o Examined variability in per-episode resource use across regions, states and the specialties of attributed providers.

Throughout the process of empirically testing the measures, summary analyses were presented to the workgroups for review and discussion. The workgroups reviewed denominator attrition diagrams to assess how the measure's inclusion and exclusion criteria affected the episode's denominator. They also reviewed summaries of costs by type of service (inpatient hospital care, outpatient care, procedures, imaging, tests, and prescription drugs) and were asked to assess whether the distributions matched the clinical expectations for the condition's treatment. The clinicians were also presented with analyses of diagnosis and procedure level details in order to ensure that appropriate services were being captured and grouped to the episodes. At each step in the process, the measure specifications were revised based on workgroup feedback.
In addition to workgroup feedback results of the preliminary testing were also shared with a Technical Advisory Committee and the QASC Episodes Work Group and the measures revised according to feedback.

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)

There were only 1843 episodes that qualified for inclusion for the colon cancer treatment episode in the Marketscan data. Of these episodes, 1091 episodes did not involve chemotherapy while 752 included treatment with chemotherapy during the follow-up period. The average episode cost for all of the episodes was $65,314. There were marked differences in the chemotherapy group (Avg cost = $119,985) and the no chemotherapy group ($27,138). When the groups were combined as a single cohort, the largest share of costs were due to chemotherapy, which accounted for more than $30,000 in average episode costs (46% of costs). The next largest fraction of costs were in for inpatient facilities which comprised about 26% of the costs. Taken together these two categories were largely responsible for nearly 3/4ths of the total costs of a colon cancer treatment episode. When the results were stratified by use of chemotherapy, the no chemotherapy group had the majority of costs coming from inpatient costs (55%) and the qualifying colectomy (11%). For the chemotherapy group almost 2/3rds of the costs were due to chemotherapy and 16% in the inpatient services category. Risk adjustment analyses were not conducted because the of low number of episodes included in the dataset.

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

The analyses conducted indicate that our measure has strong face validity for the measurement of colon cancer-related costs.

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

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

In the attached data summary, we have detailed how the exclusions impacted the resulting size of the cohort (see attached data summary Slide 4).

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)

See section SA1.1 for description of Thomson Reuters Marketscan datasets.

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

H☐ M☐ L☐ I☐

We examined the impact of several types of exclusions. In order to ensure that data are available for assessing the episode of care, we excluded individuals without continuous insurance coverage including medical and pharmacy benefits. We also excluded individuals who met standard NCQA exclusions for conditions that are resource intensive, which could potentially have a larger impact on resource use than the condition being studied (i.e., end stage renal disease, active cancer management, etc.) There were also exclusion criteria also included prior colectomy within previous 12 months. We examined the impact of these conditions on the resulting cohort size.

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

In the Marketscan database from 2006 through 2008 there were 9486 events in which a colectomy was performed and there was a diagnosis of colon cancer. However, the identification period for the colon cancer treatment measure was from July 1, 2006 to January 31, 2008 in order to have sufficient follow-up time and sufficient time prior to starting the episode to be able to characterize co-existing conditions. Therefore, 71% of the potentially eligible events fell outside the eligibility window. When combined with the exclusions for discontinuous medical coverage and lack of a prescription benefit, there were 24% of the initial episodes that were potentially eligible. From these events, a small number were excluded due to other cancers, age not between 18 and 85 years, prior colectomy and standard NCQA exclusions. This resulted in a final cohort of 1843 for evaluation of the colon cancer treatment measure.

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

Based on the findings from our cohort attrition analysis described above and feedback from the clinical workgroup, the measure is identifying the appropriate group for inclusion in the episode. The exclusions due to continuous enrollment are a function of the data that is available and necessary criteria to fully implement the measure. Importantly, the small final sample size for inclusion in the measure necessitates that the impact of the inclusion and exclusion criteria be evaluated in additional data sources.

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:** 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)* The ABMS REF has only recently completed the development and testing of its Episode-based Resource Use Measures. The Robert Wood Johnson Foundation (RWJF) has provided follow-up funding in the form of technical assistance to Aligning Forces for Quality communities for continued testing of the measures—a 15-month award to Brookings Institute with a subcontract to ABMS REF for continued field testing of select measures in up to four Aligning Forces for Quality (AF4Q) communities toward the goal of public reporting and quality improvement benchmarking. **U1.2. Use in QI** *(If used in improvement programs, provide name of program(s), locations, Web page URL(s)).* See Section U1.1 **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).* See Section U1.1	**3a** H☐ M☐ L☐ I☐
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.*	**3b** H☐ M☐ L☐

The ABMS REF measures have not yet been tested for usefulness or interpretability. They are currently undergoing continued testing in up to four RWJF AF4Q communities.	**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:* 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	**4b** **H**☐ **M**☐

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.	**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 majority of measures developed for this project are of 12 months duration or less with identification of the population in one year and measurement in the following. This resulted in eligibility criteria requiring a minimum of 24 months of continuous data (full medical and pharmacy benefit enrollment). Often, clinical workgroup members expressed a desire to extend the duration of a measure to encompass more longitudinal clinical outcomes (e.g. cardiac complications for diabetes) however this was not practical due to the typical enrollment patterns in the commercial population. • Sample size may be of concern for implementers seeking to measure resource use at the level of the individual provider. Many of the measures, when tested on commercial datasets, resulted in small sample sizes that may prohibit meaningful attribution. Discontinuous medical coverage and missing pharmacy coverage were responsible for significant (often greater than 50%) decreases in eligible populations, emphasizing the trade-offs between ensuring adequate sample size and achieving specificity/homogeneity in the measure denominator. If users are unable to achieve adequate sample size at the level of the individual provider, the measures specifications may still provide valuable information at the level of group, system or region. • Administrative claims lack the detail necessary to fully understand appropriateness of resource use in relation to severity of disease (e.g. bundled hospital payments, absence of cancer staging information, absence of cardiac severity indicators, Type 1 v. Type 2 diabetes). Future efforts should consider the integration of administrative claims with other sources of clinical information such as registries and electronic health records. • Resource use is only one component of efficiency measurement. The measures created in this project are not intended to be used in isolation to evaluate physician performance; rather they are intended to complement quality measures as an important component of performance evaluation. • The measures developed in this project represent a small subset of clinical conditions, and do not address the full range of patient and provider experience. Each measure was developed independently and, as such, they are not summative. Efforts to sum multiple measures will result in double counting of services. • The standardized pricing algorithms used for testing the measures were developed for use in the Marketscan dataset. The technical appendices accompanying the measures provide a guide to assist users in developing their own set of standardized prices unique to their datasets. Until a national list of standardized prices is made available to the general public, the methods employed in the testing phase of this project do not allow for national benchmarking.	**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).* Administrative claims lack the detail necessary to fully understand appropriateness of resource use in relation to severity of disease (e.g. bundled hospital payments, absence of cancer staging information, absence of cardiac severity indicators, Type 1 v. Type 2 diabetes). Future efforts should consider the integration of administrative claims with other sources of clinical information such as registries and electronic health records. There were several lessons learned throughout the development and testing of the ABMS REF episode-based resource use measures. First, was the importance of garnering a diverse range of clinical input in a transparent manner to foster face validity and acceptance in the clinical community. Second was the importance of adequate resources for data acquisition, preparation and analyses (time and personnel). Not all datasets are formatted the same which can lead to significant amounts of programmer time for re-formatting code or datasets. It is also important to allow 2-6 months lead time to negotiate data use agreements as use of health care data–even de-identified data--often involves complex contract negotiations.	**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

American Board of Medical Specialties Research and Education Foundation, 222 N. LaSalle St., Suite 1500, Chicago, Illinois, 60601

Co.2 Point of Contact

Kevin, Weiss, MD, kweiss@abms.org, 312-436-2600-

Measure Developer If different from Measure Steward

Co.3 Organization

American Board of Medical Specialties Research and Education Foundation, 222 N. LaSalle St., Suite 1500, Chicago, Illinois, 60601

Co.4 Point of Contact

Kevin, Weiss, MD, kweiss@abms.org, 312-436-2600-

Co.5 Submitter If different from Measure Steward POC

Robin, Wagner, rwagner@abms.org, 312-436-2605-, American Board of Medical Specialties Research and Education Foundation

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

Development of the ABMS REF Episode-based Resource Use Measures was supported by the Robert Wood Johnson Foundation under the High Value Healthcare Project: Characterizing Episodes and Costs of Care. Grant number 63609.

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.

Colon Cancer Workgroup Members
John Allen, MD, American Gastroenterological Association
William Bowman, MD, Moses Cone Health System
Samuel Durso, MD, American Geriatrics Society
C. Daniel Johnson, MD, American College of Radiology

David Kirlin, MD, American Society of Clinical Oncology
Bruce Minsky, MD, American Society for Radiation Oncology
Amita Rastogi, MD, Prometheus Payment
Stephen Scott, MD, American Academy of Family Physicians
Anthony Senagore, MD, American Society of Colon and Rectal Surgeons
V. O. Speights, MD, College of American Pathologists

Workgroups consisting of a panel of experts were assembled for each condition. In collaboration with the AMA PCPI, a formal call for nominations was issued to the PCPI membership. This process was supplemented with direct outreach to relevant organizations in an effort to achieve representation from a wide range of clinical expertise (medical, nursing, pharmacy, other allied health professionals). Workgroup members were selected based on their clinical knowledge and administrative experience—many also had significant experience in developing quality measures. Where possible, groups also included technical expertise from the health plan perspective.
The measure development process involved a series of deliberate steps where participating clinicians took into account the natural progression of a condition and existing best practices before carefully considering how to best use administrative claims data to construct the episode.

Each clinical workgroup initially convened for a two-day in-person meeting that began with an introduction to the concepts of episodes of care and resource use measurement-- including a review of the NQF framework for evaluating efficiency across episodes of care. The groups were then asked to conceptualize one or more episodes based on the phases of the NQF model. They aimed to identify clinically homogenous populations so that the measures would be sensitive to provider decisions and existing practice protocols for like patients. Workgroup members were then asked to conceptualize the measure specifications based on their combined knowledge of guidelines, evidence, and clinical experience. The workgroups helped to define the denominator, duration, clinically relevant services and attribution of each episode as related to the clinical progression and treatment of the condition.

Throughout the months following the in-person meeting, project staff then worked to translate the concepts into detailed written measure specifications. The workgroups subsequently re-convened via a series of conference calls to review data analyses, share expert opinions, consider additional evidence-based literature, revise and finalize the measure specifications.

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released:

2010

Ad.3 Month and Year of most recent revision:

12, 2010

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

every 3 years

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

12, 2013

Ad.6 Copyright statement/disclaimers:

purposes, e.g., use by health care providers in connection with their practices. Commercial use is defined as the sale, license, or distribution of the Measures for commercial gain, or incorporation of the Measures into a product or service that is sold, licensed or distributed for commercial gain. Commercial uses of the Measures require a license agreement between the user and ABMS REF. Neither the ABMS REF nor its members shall be responsible for any use of these Measures.
Portions of the exclusion criteria in the ABMS REF episode-based resource use measures were adapted from HEDIS ® measure specifications.
Limited proprietary coding is contained in the Measure specifications for convenience. Users of the proprietary code sets should obtain all necessary licenses from the owners of these code sets. The ABMS REF disclaims all liability for use or accuracy of coding contained in the specifications.

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

04/18/2011

Variable Name	Variable Description	Required Data Sources*
admdate	Date of Admission	A
age	Age	E
billtyp	Facility Bill Type Code	C
days	Length of Stay	A
daysupp	Day's Supply	D
disdate	Date of Discharge	A
drg	Diagnosis related group	A,B
dstatus	Discharge status	A
egeoloc	Geographic Location	E
enrolid	Enrollee ID	All
fachdid	Facility Header Record ID	C
facprof	Professional/Facility Indicator	C
gennme	Generic Drug Name	D
mastfrm	Master Form Code	D
memdays	Member Days	E
ndcnum	National Drug Code (ndc_code in Redbook)	D
pay	Payment	A,B,C,D
pdx,dx1,dx2,…,dxn	Diagnosis Codes	A,B,C
physid	Physician ID	A,B
pproc, pproc1,…, pprocn	Procedure/Service Codes	A,B,C
procmod	Procedure Code Modifier	A,C
proctyp	Procedure Code Type	B,C
prodnme	Product Name	D
provid	Provider ID	A
qty	Quantity of Services	A,B,C,D
region	Region	E
revcode	Revenue Code	C
rx	Cohort Drug Indicator	D
sex	Gender	E
stdplac	Place of Service	C
stdprov	Provider Type	C
svcdate	Service Date	A,B,C,D
thercls	Therapeutic Class	D
tsvcdat	Date Service Ending	C

Data Sources*

A. Administrative claims data – inpatient (facility)
B. Administrative claims data – inpatient (professional)
C. Administrative claims data – outpatient/ambulatory (professional and facility)
D. Administrative claims data – pharmacy
E. Enrollment/coverage data (2 or more years)

Measure Component	**Required Variables**
Standardized Prices*	enrolid, ndcnum, pay, qty, drg, pproc,…,pprocn.
Exclusions and standard coverage definition	enrolid, pdx,dx1,…,dxn, age, svcdate, pproc, pproc1,…, pprocn, pay, qty, revcode, memdays, rx, stdplac, proctyp.
Cohort Definition	enrolid, svcdate, pdx, pdx1,…,pdxn, pproc1,…, pprocn, pay, qty, sex, age, thercls, dstatus, stdplac, billtyp, fachdid, revcode.
Related Resource Use	enrolid, facprof, pay, qty, pproc1,…, pprocn, svcdate, admdate, disdate, pdx, dx1,…, dxn, drg, ndcnum, thercls, gennme, prodnme, daysupp, procmod, mastfrm.
Output and Attribution	enrolid, svcdate, standardized price variables*, BETOS**, pproc1,…,pprocn, pdx, dx1,…,dxn, egeoloc, region, provid, stdprov, age, sex, physid.

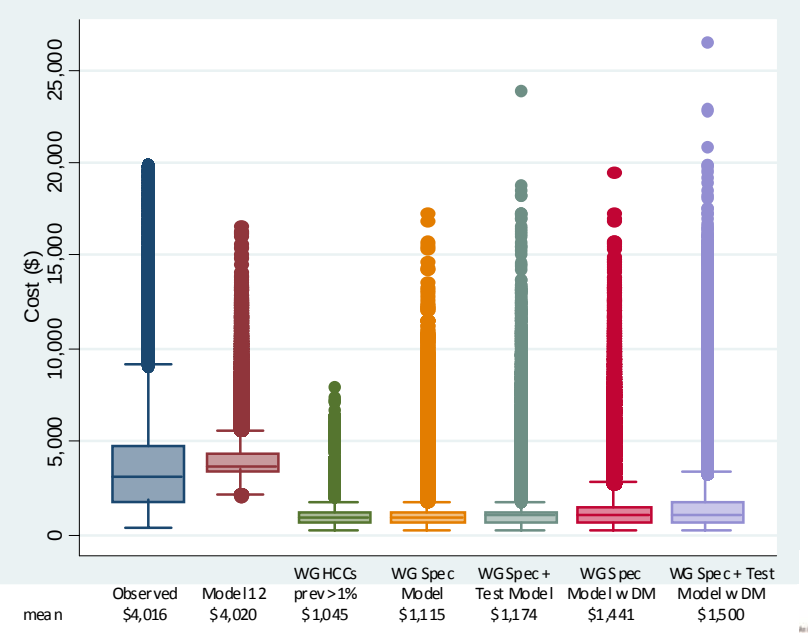
* For internal testing and validation purposes, drug prices were calculated by taking the average of 2006 and 2007 Marketscan prices, inpatient facility prices were computed by calculating average daily price by DRG from 2007, and outpatient and service prices were constructed by calculating the mean price by procedure code within the Marketscan dataset.
** Berenson-Eggers Type of Service – Categorizes Health Care Procedure Coding System (HCPCS) procedure codes in order to analyze health care expenditures. See link for full description.
http://www.cms.hhs.gov/hcpcsreleasecodesets/20_betos.asp

Condition (Workgroup)	***Measure Name***	***Abbreviation***
Acute Myocardial Infarction (AMI)	Episode-of-Care for 30 days Following Onset	AMI1
Acute Myocardial Infarction (AMI)	Episode-of-Care for Post-Acute Period (Days 31-365 Days Post-Event)	AMI2
Asthma	Episode-of-Care for Patients with Asthma over a 1-year Period	ASTH
Breast Cancer	Episode-of-Care for 60-Day Period Preceding Breast Biopsy	BB
Breast Cancer	Episode-of-Care for Treatment in Newly Diagnosed Cases of Breast Cancer over a 15-month Period	BCT
Chronic Obstructive Pulmonary Disease (COPD)	Episode-of-Care for Patients with Stable COPD over a 1-year Period	COPD1
Chronic Obstructive Pulmonary Disease (COPD)	Episode-of-Care for Patients with Unstable COPD over a 1-year Period	COPD2
Colon Cancer	Episode-of-Care for 21-Day Period Around Colonoscopy	COL
Colon Cancer	Episode-of-Care for Treatment of Localized Colon Cancer	CCT
Congestive Heart Failure (CHF)	Episode-of-Care for Management of CHF Over 1-Year Period	CHF1
Congestive Heart Failure (CHF)	Episode-of-Care for Post Hospitalization Management of CHF over 4-Month Period	CHF2
Coronary Artery Disease (CAD)	Episode-of-Care for Management of Chronic CAD Over 1-Year Period	CAD1
Coronary Artery Disease (CAD)	Episode-of-Care for Management of CAD Post Revascularization Over 1-Year Period	CAD2
Diabetes	Episode-of-Care for Diabetes Over 1-Year Period	DIAB
Low Back Pain	Episode-of-Care for Simple Non-Specific Lower Back Pain (Acute and Sub-Acute)	LBP1
Low Back Pain	Episode-of-Care for Acute/Sub-Acute Lumbar Radiculopathy With or Without Lower Back Pain	LBP2
Pneumonia	Episode-of-Care for Community-Acquired Pneumonia Hospitalization	PN1
Pneumonia	Episode-of-Care for Ambulatory Pneumonia Episode	PN2

Comparison 'off the shelf' HCC Values with Episode-specific Risk Adjustment Model

Below we show the figure for the comparison of the diabetes risk adjustment model with diabetes risk adjustment models if we had used HCC values. The first box plot in the figure shows the observed costs in for the episode. The second box plot shows the risk adjustment model that we developed for our diabetes episode that is focused on diabetes-related costs. The final five box plots show the distribution of predicted costs including different HCCs for our diabetes episode if we had relied on the off the shelf HCC values. The mean predicted value for all of the off the shelf HCCs models is $1500 or less, while the observed episode costs were slightly more than $4,000. Given the disparity in the means and distributions of the off the shelf HCC values we felt this justified our approach to develop risk adjustment models for each of our episodes that were focused on episode specific costs

Observed and Predicted Values – Diabetes Episode with "off the shelf HCCs"



For this reason, we have developed separate risk adjustment models for each of our episodes that are based on episode-specific costs. We realize this increases the complexity of implementing our measures; however, we feel it is a more appropriate approach for risk adjustment within our episodes. Within our risk adjustment approach, we control for different comorbidities for each condition because patients with each of the measurement conditions often had very different risk profiles.

We used the following risk adjustment strategy in the development of our risk adjustment models:

1. Utilized quasi-Modified Delphi approach with the condition-specific workgroup to categorize HCCs into three groups:

- Include in risk adjustment model;
- Exclude in risk adjustment model; and
- Test impact in risk adjustment model.

2. Identified HCCs in denominator population during the 12 months before the measurement year.

3. Tested 12 different model specifications shown in Table 1 (below), where the HCCs included in the model varied, and the distribution and link functions in the generalized linear models also varied. Models were developed in a stepwise manner as indicated. The first four models used a gamma distribution and a log link function. This functional form of the model was selected as cost data are typically skewed and we wanted to account for that in the analysis. The first model included all HCCs identified by the condition-specific workgroup as "Include HCCs" with a prevalence in the population of >=1%. The second model was a reduction of the first model that only included HCCs where $p<0.1$. The third model extended the second model by including HCCs with prevalence >=1% identified as "Test HCCs" by the condition-specific workgroup. The fourth model was a reduction of the third model and included only those HCCs where $p<0.1$. The next set of four models (Models 5-8) repeated the process of the first four models but used a normal distribution and identity link function. We opted to include this functional form of the model so that the model output could be interpreted in dollars without requiring a transformation. We followed this strategy as we felt it would be easier for those implementing our measure to create their own risk adjustment models using this functional form of the model if they decided to create their own models. Finally, we opted to evaluate models that included all of the HCCs in case the work group may have failed to include HCCs that were influential on the overall episode costs. Model 9 used all of the HCCs, with the exception of the HCC for the episode being evaluated (e.g., diabetes for the diabetes episode; however HCCs for complications of diabetes were included), and a gamma distribution with log link function. Model 10 was a reduction of Model 9 where only the HCCs with $p<0.1$ were included. The final two models (Models 11-12) used the same process as Models 9 and 10 with a normal distribution and identity link function.

Table 1. Risk Adjustment Model Specifications

Model #	Independent Variables						Distri-bution	Link function
	WG Specified (> 1%)	WG specified (> 1%) p < 0.1	Test conditions (> 1%)	Test conditions (> 1%) p < 0.1	All HCCs	All HCCs p < 0.1		
1	X						Gamma	Log
2		X					Gamma	Log
3		X	X				Gamma	Log
4		X		X			Gamma	Log
5	X						Normal	Identity
6		X					Normal	Identity
7		X	X				Normal	Identity
8		X		X			Normal	Identity
9					X		Gamma	Log
10						X	Gamma	Log
11					X		Normal	Identity
12						X	Normal	Identity

4. Models were developed in a split sample approach with 75% of the population randomly selected for model development and the remaining 25% used in model evaluation. Model performance was also evaluated in the full cohort.

5. The performance of each model was evaluated through comparisons of the observed and predicted distributions, comparisons of residuals, comparisons of absolute differences between observed and predicted, comparisons of observed-to-predicted ratios, and comparisons of mean squared errors across models. Summary information on model performance was presented to the condition-specific workgroup for selection of a risk adjustment model for the condition. Final model selection was based on the best performing model across metrics. Where model performance was similar, models using the normal distribution were preferentially chosen over the gamma distribution models for ease of implementation. More parsimonious models were also preferentially chosen.

Sample Provider Summary Report

Report for Physician #xxxxx

Provider type = insert specialty

	MD	Peer Group	Non-Peer Group	National Avg
Episodes	21	9,512	68,434	77,967
Observed Costs*				
Average	$ 897	$ 992	$ 1,481	$ 1,421
Min	$ 45	$ 12	$ 12	$ 12
Median	$ 747	$ 538	$ 853	$ 807
Max	$ 2,797	$ 11,140	$ 11,140	$ 11,140
Predicted Costs				
Average	$ 1,400	$ 1,083	$ 1,523	$ 1,470
Min	$ 966	$ 831	$ 831	$ 831
Median	$ 1,126	$ 1,039	$ 1,502	$ 1,392
Max	$ 2,345	$ 8,286	$ 6,883	$ 8,286
Observed-to-Expected Ratio				
Average	0.64	0.91	0.98	0.97
Min	0.03	0.01	0.01	0.01
Median	0.54	0.51	0.58	0.57
Max	1.54	13.40	13.40	13.40
% ≥ 2.0	0%	10.9%	11.6%	11.5%
% ≥ 2.5	0%	7.0%	7.7%	7.6%
% ≥ 75th percentile peers	50.0%	(0%, 20.9%)		

* Observed costs adjusted for outliers (windsorized)

Notes:
- Use Model 12
- Includes all episodes

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Analytic Findings: Colon Cancer Treatment Episode of Care

NQF Submission

Overview of Analyses Presented for Colon Cancer Episode*

- Denominator Attrition
- Related and Non-related Services
- Resource Use, Attribution and
- Risk Adjustment

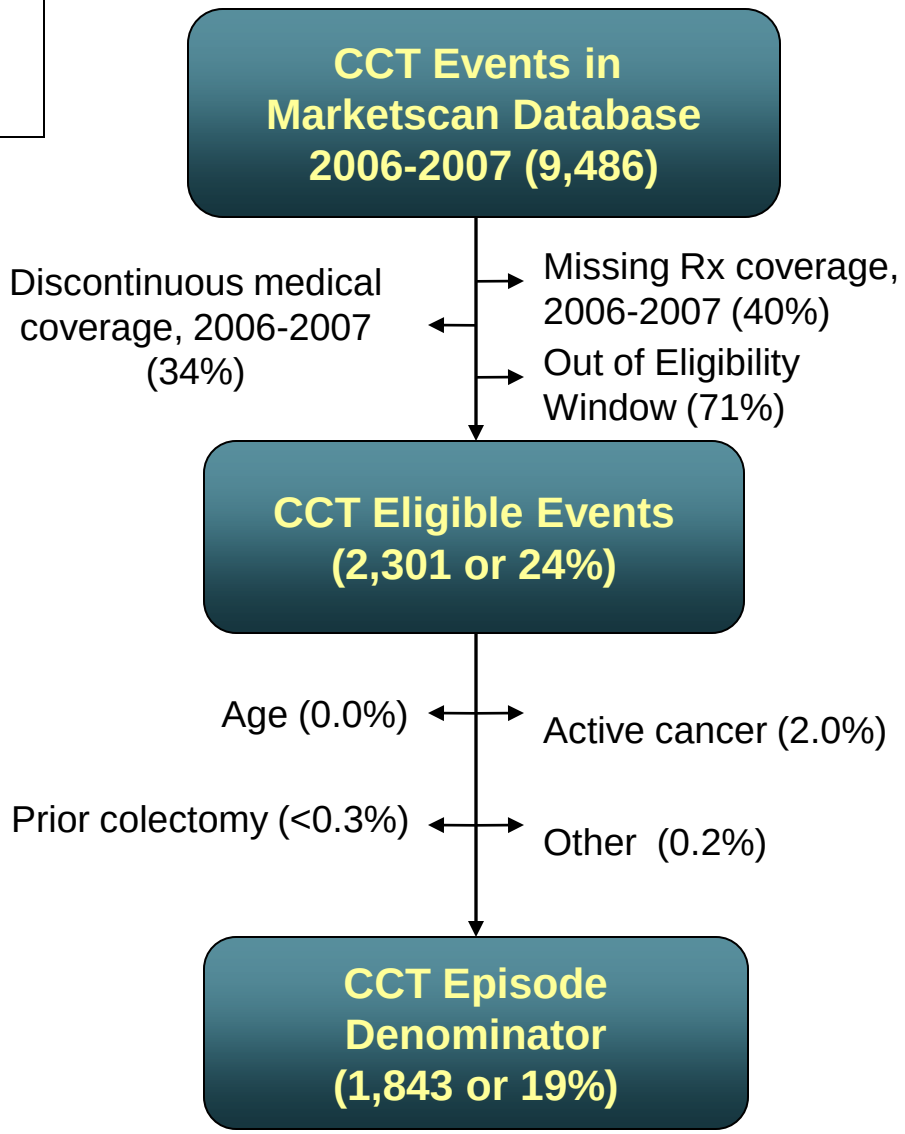
** The following results are based on the measure specification at different points in time, so the numbers are not always consistent, but they are not substantively different.*

Denominator Attrition

- Summarizes the initial denominator based on the workgroup's specifications
- Describes the percentage of enrollees removed from the analysis due to NCQA exclusions or other criteria.

Colon Cancer Treatment Measure Denominator

- Procedure code for colectomy and dx for colon cancer
- Identification period: Jul. 1, 2006 – Jan. 31, 2008
- Age 18-85
- Exclusions:
  - Prior colectomy
  - Active cancer (except colon cancer)
  - ESRD, dialysis
  - Renal failure
  - Organ transplant
  - HIV / AIDS
- Note: exclusions are not additive (double-counting occurs often); figures do not exclude episodes with $0 in related resource use



Related and Non-Related Services

- Examines most frequent related and non-related resource use by BETOS category
  - Evaluation and Management Visits, Procedures, Imaging, Tests, Admissions and Medications.
- Results are presented to the workgroup to examine the face validity of episodes.

Top 20, Colon Cancer Treatment-related Inpatient E&M

- 0.1% of total episode costs

CPT	Svcs	Cost	% of Svcs	% of Cost	Description
99233	95	$13,975	51.4%	47.5%	Subsequent hospital care, per day
99255	26	$6,303	14.1%	21.4%	Inpatient consultation for a new or established patient
99222	7	$3,346	3.8%	11.4%	Initial hospital care, per day, 50 min
99251	17	$1,104	9.2%	3.8%	Inpatient consultation for a new or established patient,
99284	2	$466	1.1%	1.6%	Emergency department visit
99238	5	$447	2.7%	1.5%	Hospital discharge day management; 30 minutes or less
99231	9	$428	4.9%	1.5%	Subsequent hospital care, per day
99221	4	$426	2.2%	1.4%	Initial hospital care, per day
99356	3	$388	1.6%	1.3%	Prolonged physician service in the inpatient setting
99239	3	$377	1.6%	1.3%	Hospital discharge day management; more than 30 minutes
99292	2	$334	1.1%	1.1%	Critical care, E&M, each additional 30 mins.
99291	1	$315	0.5%	1.1%	Critical care, first 30-74 minutes
99236	1	$265	0.5%	0.9%	Observation or inpatient hospital care
99253	2	$263	1.1%	0.9%	Inpatient consultation for a new or established patient
99223	1	$200	0.5%	0.7%	Initial hospital care, per day, 70 minutes
99252	2	$199	1.1%	0.7%	Inpatient consultation, 40 minutes
94657	2	$184	1.1%	0.6%	Ventilation assist and management; subsequent days
94656	1	$172	0.5%	0.6%	Ventilation assist and management; first day
99357	1	$140	0.5%	0.5%	Prolonged physician service in the inpatient setting
90816	1	$77	0.5%	0.3%	Individual psychotherapy, insight oriented, 20-30 minutes
Total	**185**	**$29,408**	**100.0%**	**100.0%**	

Non-Related Inpatient E&M, Top 20 ICD-9 Codes

ICD-9 Code	Related	Not Related	Related Costs	Non-Related Costs
6826 -Cellulitis of Leg	0	3	$0	$675
5609 -Intestinal Obstruct NOS	8	7	$1,244	$493
5361 -Ac Dilation of Stomach	0	1	$0	$478
5362 -Persistent Vomiting	0	1	$0	$478
436 -CVA	0	4	$0	$430
25010-Dm II Keto Nt St Uncntrld	0	1	$0	$315
34982-Toxic Encephalopathy	0	1	$0	$242
6823 -Cellulitis of Arm	0	1	$0	$242
7806 -Fever	5	1	$614	$233
1977 -Second Malig Neo Liver	0	2	$0	$213
135 -Sarcoidosis	0	1	$0	$131
41090-AMI NOS, Unspecified	0	1	$0	$107
6829 -Cellulitis NOS	1	1	$89	$107
4571 -Other Lymphedema	0	1	$0	$100

Top 20, Colon Cancer Treatment-related Outpatient E&M

- 2.4% of total episode costs

CPT	Svcs	Cost	% of Svcs	% of Cost	Description
99214	2,391	$231,130	20.9%	21.1%	Office or other outpatient visit; established patient
99232	1,528	$121,716	13.4%	11.1%	Subsequent hospital care, per day
99213	1,795	$116,803	15.7%	10.7%	Office or other outpatient visit; established patient
99245	264	$69,045	2.3%	6.3%	Office consultation for a new or established patient; 80 min
99215	434	$59,778	3.8%	5.5%	Office or other outpatient visit; established patient
99233	465	$51,350	4.1%	4.7%	Subsequent hospital care, per day
99244	246	$50,076	2.2%	4.6%	Office consultation for a new or established patient; 60 min
99254	227	$40,761	2.0%	3.7%	Inpatient consultation for a new or established patient; 80 min
99211	1,481	$37,378	13.0%	3.4%	Office or other outpatient visit; established patient
99601	337	$35,682	3.0%	3.3%	Home infusion/specialty drug administration, per visit
99231	624	$32,613	5.5%	3.0%	Subsequent hospital care, per day
99255	131	$31,615	1.1%	2.9%	Inpatient consultation for a new or established patient
99222	77	$30,520	0.7%	2.8%	Initial hospital care, per day; 50 min
99291	68	$26,102	0.6%	2.4%	Critical care; first 30-74 minutes
99285	85	$25,118	0.7%	2.3%	Emergency department visit
99223	105	$21,007	0.9%	1.9%	Initial hospital care, per day; 70 min
99253	151	$19,838	1.3%	1.8%	Inpatient consultation for a new or established patient; 55 min
99212	395	$17,641	3.5%	1.6%	Office or other outpatient visit
99243	117	$17,168	1.0%	1.6%	Office consultation for a new or established patient; 40 min
99238	109	$9,745	1.0%	0.9%	Hospital discharge day management; 30 minutes or less
Total	**11,420**	**$1,096,558**	**100.0%**	**100.0%**	

Non-Related Outpatient E&M, Top 20 ICD-9 Codes

ICD-9 Code	Related	Not Related	Related Costs	Non-Related Costs
1540 -Mal Neo Rectosigmoid Jct	72	312	$6,364	$36,910
4011 -Benign Hypertension	98	247	$7,541	$20,553
25000-Dm II wo Cmp Nt St Uncntr	51	198	$6,357	$17,489
4019 -Hypertension NOS	47	180	$3,928	$14,777
2113 -Benign Neoplasm Lg Bowel	10	91	$701	$12,907
5609 -Intestinal Obstruct NOS	71	86	$11,627	$12,748
V7231-Routine Gyn Examination	0	82	$0	$9,859
V1005-Hx of Colonic Malignancy	2	124	$141	$9,439
78650-Chest Pain NOS	99	56	$8,150	$8,496
4770 -Rhinitis Due to Pollen	1	64	$96	$8,025
V700 -Routine Medical Exam	1	58	$124	$7,247
V5811-Antineoplastic Chemo Enc	8	96	$519	$6,877
41401-Crnry Athrscl Natve Vssl	18	63	$1,530	$6,786
5693 -Rectal & Anal Hemorrhage	14	49	$1,763	$6,339
7806 -Fever	75	48	$7,140	$6,323
5789 -Gastrointest Hemorr NOS	141	34	$20,948	$5,410
2352 -Unc Behav Neo Intestine	17	46	$1,613	$4,959
25002-Dm II wo Cmp Uncntrld	11	54	$963	$4,910
51881-Acute Respiratry Failure	114	30	$12,451	$4,763
V7284-Preop Exam Unspcf		33		$4,687

Top 20, Colon Cancer Treatment-related Procedures

- 6.1% of total episode costs

CPT	Svcs	Cost	% of Svcs	% of Cost	Description
00790	482	$556,085	3.5%	19.9%	Anesthesia for intraperitoneal procedures in upper abdomen
90767	2,563	$231,719	18.8%	8.3%	Intravenous infusion, for therapy, prophylaxis, or diagnosis
00840	206	$220,477	1.5%	7.9%	Anesthesia for intraperitoneal procedures in lower abdomen; NOS
45380	375	$173,204	2.7%	6.2%	Colonoscopy, flexible, proximal to splenic flexure; with biopsy
36561	169	$154,906	1.2%	5.5%	Insertion of tunneled centrally inserted CVA device
45385	219	$126,349	1.6%	4.5%	Colonoscopy, flexible; with removal of tumor(s) by snare technique
90775	1,960	$108,519	14.4%	3.9%	Therapeutic, prophylactic or diagnostic injection
00532	184	$93,144	1.3%	3.3%	Anesthesia for access to central venous circulation
90768	1,450	$52,392	10.6%	1.9%	Intravenous infusion, for therapy, prophylaxis, or diagnosis
77418	53	$47,108	0.4%	1.7%	Intensity modulated treatment delivery
90765	395	$41,025	2.9%	1.5%	Intravenous infusion, for therapy, prophylaxis, or diagnosis; initial
90766	939	$41,019	6.9%	1.5%	IV infusion, for therapy, prophylaxis, or diagnosis addtnl hour
45378	95	$40,233	0.7%	1.4%	Colonoscopy, flexible; with or w/out removal of specimens by brushing
01996	247	$36,907	1.8%	1.3%	Daily hospital management of epidural
90772	1,363	$31,773	10.0%	1.1%	Therapeutic, prophylactic or diagnostic injection
00844	15	$25,938	0.1%	0.9%	Anesthesia for intraperitoneal procedures in lower abdomen
45384	48	$23,781	0.4%	0.9%	Colonoscopy, flexible; tumor removal by hot biopsy forceps
45381	79	$22,593	0.6%	0.8%	Colonoscopy, flexible; with submucosal injection(s)
44139	138	$21,868	1.0%	0.8%	Mobilization of splenic flexure performed w/ partial colectomy
47600	25	$21,812	0.2%	0.8%	Cholecystectomy;
Total	**13,653**	**$2,791,947**	**100.0%**	**100.0%**	

Common Non-Related Procedures, CPT Codes

CPT	Label	Related	Not Related	Related Costs	Non-Related Costs
00790	Anesthesia for intraperitoneal procedures in upper abdomen	482	107	$556,085	$97,149
36561	Insertion of tunneled centrally inserted central venous access	169	97	$154,906	$86,384
00810	Anesthesia for lower intestinal endoscopic procedures, endos	48	136	$18,239	$52,795
00532	Anesthesia for access to central venous circulation	184	83	$93,144	$37,719
00840	Anesthesia for intraperitoneal procedures in lower abdomen	206	37	$220,477	$27,907
43239	Upper gastrointestinal endoscopy including esophagus, stoma	55	67	$16,452	$20,091
36590	Removal of tunneled central venous access device, with subcu	44	51	$15,402	$17,812
97110	Therapeutic procedure, one or more areas, each 15 minutes; t	0	328	$0	$17,390
47130	Hepatectomy, resection of liver; total right lobectomy	2	4	$5,341	$16,695
00400	Anesthesia for procedures on the integumentary system on th	20	25	$7,889	$10,941
00740	Anesthesia for upper gastrointestinal endoscopic procedures,	10	27	$3,754	$9,708
43235	Upper gastrointestinal endoscopy including esophagus, stoma	21	19	$5,642	$9,367
00792	Anesthesia for intraperitoneal procedures in upper abdomen	6	5	$8,149	$9,187
47120	Hepatectomy, resection of liver; partial lobectomy	4	4	$7,259	$9,144
93510	Left heart catheterization, retrograde, from the brachial artery	2	16	$786	$8,720
90767	Intravenous infusion, for therapy, prophylaxis, or diagnosis (s	2,563	134	$231,719	$8,296
90775	Therapeutic, prophylactic or diagnostic injection (specify subs	1,960	125	$108,519	$7,794
49560	Repair initial incisional or ventral hernia; reducible	10	9	$7,820	$7,138
90772	Therapeutic, prophylactic or diagnostic injection (specify subs	1,363	260	$31,773	$6,094
00844	Anesthesia for intraperitoneal procedures in lower abdomen	15	4	$25,938	$5,178

Related Inpatient Admissions, Colon Cancer Treatment Episode, 2006

- 25.8% of total episode costs

ICD-9 Diagnosis	N	Amount
1533 -Mal Neo Sigmoid Colon	153	$2,007,396
1536 -Malig Neo Ascend Colon	106	$1,549,419
1534 -Malignant Neoplasm Cecur	99	$1,302,310
1531 -Mal Neo Transverse Colon	43	$581,442
1532 -Mal Neo Descend Colon	32	$491,232
2113 -Benign Neoplasm Lg Bowe	27	$396,177
1540 -Mal Neo Rectosigmoid Jct	26	$304,080
1530 -Mal Neo Hepatic Flexure	18	$253,568
1535 -Malignant Neo Appendix	19	$236,646
9974 -Surg Comp-Digestv System	14	$199,609
1537 -Mal Neo Splenic Flexure	16	$194,762
1976 -Sec Mal Neo Peritoneum	1	$144,018
2352 -Unc Behav Neo Intestine	9	$140,869
1539 -Malignant Neo Colon NOS	12	$131,181
2303 -CA in Situ Colon	6	$123,028
99859-Other Postop Infection	6	$74,784
1538 -Malignant Neo Colon NEC	6	$68,753
1522 -Malignant Neoplasm Ileum	3	$51,127
0389 -Septicemia NOS	3	$43,352
56081-Intestinal Adhes w Obstr	1	$41,712
Top 10	537	$7,321,879
Grand Total	637	$8,754,907

DRGlabel	N	Amount
570-MAJOR SMALL & LARGE BOWEL PR	463	$5,977,537
569-MAJOR SMALL & LARGE BOWEL PR	56	$1,368,374
149-MAJOR SMALL & LARGE BOWEL PR	55	$794,125
188-OTHER DIGESTIVE SYSTEM DIAGNC	8	$108,482
568-STOMACH, ESOPHAGEAL & DUODE	5	$95,166
172-DIGESTIVE MALIGNANCY W CC	15	$51,503
418-POSTOPERATIVE & POST-TRAUMAT	4	$43,036
146-RECTAL RESECTION W CC	2	$38,407
579-POSTOPERATIVE OR POSTTRAUMA	2	$31,748
572-MAJOR GASTROINTESTINAL DISOR	3	$29,637
576-SEPTICEMIA W/O MV 96+ HOURS W	3	$28,404
182-ESOPHAGITIS, GASTROENT & MISC	5	$27,777
189-OTHER DIGESTIVE SYSTEM DIAGNC	3	$26,988
157-ANAL & STOMAL PROCEDURES W C	1	$23,045
452-COMPLICATIONS OF TREATMENT W	1	$21,494
567-STOMACH, ESOPHAGEAL & DUODE	1	$20,223
398-RETICULOENDOTHELIAL & IMMUNIT	2	$18,168
578-INFECTIOUS & PARASITIC DISEASES	1	$18,004
477-NON-EXTENSIVE O.R. PROCEDURE	1	$17,752
164-APPENDECTOMY W COMPLICATED	2	$5,015
Top 10	613	$8,538,015
Grand Total	637	$8,754,907

Non-Related Inpatient Admissions, Colon Cancer Treatment Episode, 2006

ICD-9 Diagnosis	N	Amount
41071-Subendo Infarct, Initial	4	$57,679
1977 -Second Malig Neo Liver	3	$46,775
1976 -Sec Mal Neo Peritoneum	1	$43,632
486 -Pneumonia, Organism NOS	2	$31,059
5672 -Suppurat Peritonitis NEC	2	$30,006
44421-Upper Extremity Embolism	1	$29,784
V581 -Chemotherapy Encounter	3	$26,235
41401-Crnry Athrscl Natve Vssl	4	$25,321
V552 -Atten to Ileostomy	1	$21,096
V553 -Atten to Colostomy	1	$20,952
19889-Secondary Malig Neo NEC	2	$20,857
99674-Comp-Oth Vasc Dev/Graft	2	$18,548
5400 -Ac Append w Peritonitis	5	$17,914
2182 -Subserous Leiomyoma	1	$17,640
2155 -Ben Neo Soft Tis Abdomen	1	$16,566
2381 -Unc Behav Neo Soft Tissu	1	$16,566
82021-Intertrochanteric Fx-Cl	1	$16,070
2592 -Carcinoid Syndrome	1	$15,620
2765 -Hypovolemia	2	$15,527
2113 -Benign Neoplasm Lg Bowe	2	$15,028
Top 10	22	$332,539
Grand Total	116	$832,399

DRGlabel	N	Amount
468-EXTENSIVE O.R. PROCEDURE UNRE	5	$89,416
108-OTHER CARDIOTHORACIC PROCED	2	$50,094
568-STOMACH, ESOPHAGEAL & DUODE	1	$43,632
170-OTHER DIGESTIVE SYSTEM O.R. PR	3	$31,989
110-MAJOR CARDIOVASCULAR PROCED	1	$29,784
191-PANCREAS, LIVER & SHUNT PROCE	2	$28,485
410-CHEMOTHERAPY W/O ACUTE LEUK	3	$26,235
144-OTHER CIRCULATORY SYSTEM DIA	2	$26,221
188-OTHER DIGESTIVE SYSTEM DIAGNO	3	$25,608
181-G.I. OBSTRUCTION W/O CC	4	$22,399
152-MINOR SMALL & LARGE BOWEL PRO	1	$21,096
150-PERITONEAL ADHESIOLYSIS W CC	1	$20,952
406-MYELOPROLIF DISORD OR POORLY	2	$20,857
556-PERCUTANEOUS CARDIOVASC PRO	3	$20,622
164-APPENDECTOMY W COMPLICATED	6	$20,285
358-UTERINE & ADNEXA PROC FOR NON	2	$19,600
199-HEPATOBILIARY DIAGNOSTIC PROC	1	$18,290
124-CIRCULATORY DISORDERS EXCEPT	2	$16,784
130-PERIPHERAL VASCULAR DISORDER	2	$16,730
210-HIP & FEMUR PROCEDURES EXCEP	1	$16,070
Top 10	26	$373,863
Grand Total	116	$832,399

Related Inpatient Admissions, Colon Cancer Treatment Episode, 2007

ICD-9 Diagnosis	N	Amount
1533 -Mal Neo Sigmoid Colon	29	$504,628
03811-Staph Aureus Septicemia	2	$383,228
1534 -Malignant Neoplasm Cecur	13	$197,072
99859-Other Postop Infection	7	$166,573
1530 -Mal Neo Hepatic Flexure	8	$138,022
1536 -Malig Neo Ascend Colon	8	$127,815
1539 -Malignant Neo Colon NOS	8	$127,492
51881-Acute Respiratry Failure	1	$110,000
9974 -Surg Comp-Digestv System	6	$109,307
1540 -Mal Neo Rectosigmoid Jct	7	$105,903
56081-Intestinal Adhes w Obstr	3	$104,249
2113 -Benign Neoplasm Lg Bowe	7	$102,958
1531 -Mal Neo Transverse Colon	4	$99,977
27651-Dehydration	9	$98,233
41519-Pulm Embol/Infarct NEC	7	$75,297
1537 -Mal Neo Splenic Flexure	3	$50,671
V553 -Atten to Colostomy	3	$42,988
99851-Infected Postop Seroma	1	$42,960
2352 -Unc Behav Neo Intestine	2	$40,963
03819-Staphylcocc Septicem NEC	1	$39,728
Top 10	89	$1,970,040
Grand Total	163	$3,022,174

DRGlabel	N	Amount
330-Major small & large bowel procedures v	78	$1,297,651
853-Infectious & parasitic diseases w O.R. p	1	$347,220
329-Major small & large bowel procedures v	12	$294,426
856-Postoperative or post-traumatic infectio	4	$168,976
331-Major small & large bowel procedures v	11	$124,490
166-Other resp system O.R. procedures w M	1	$110,000
641-Nutritional & misc metabolic disorders v	9	$98,233
392-Esophagitis, gastroent & misc digest di	11	$85,995
872-Septicemia w/o MV 96+ hours w/o MCC	5	$76,075
176-Pulmonary embolism w/o MCC	5	$52,377
326-Stomach, esophageal & duodenal proc	1	$43,296
356-Other digestive system O.R. procedures	1	$37,677
854-Infectious & parasitic diseases w O.R. p	1	$36,008
372-Major gastrointestinal disorders & perit	1	$21,952
375-Digestive malignancy w CC	2	$21,618
374-Digestive malignancy w MCC	1	$20,878
394-Other digestive system diagnoses w CC	2	$20,760
982-Extensive O.R. procedure unrelated to p	1	$19,327
327-Stomach, esophageal & duodenal proc	1	$16,254
167-Other resp system O.R. procedures w C	1	$15,636
Top 10	137	$2,655,443
Grand Total	163	$3,022,174

Non-Related Inpatient Admissions, Colon Cancer Treatment Episode, 2007

ICD-9 Diagnosis	N	Amount
1977 -Second Malig Neo Liver	14	$163,949
V5811-Antineoplastic Chemo Enc	12	$103,009
99662-React-Oth Vasc Dev/Graft	5	$79,098
5601 -Paralytic Ileus	5	$71,568
1962 -Mal Neo Lymph Intra-Abd	2	$58,206
55321-Incisional Hernia	7	$54,830
5609 -Intestinal Obstruct NOS	7	$53,934
99674-Comp-Oth Vasc Dev/Graft	2	$45,195
5849 -Acute Renal Failure NOS	5	$45,009
4414 -Abdom Aortic Aneurysm	2	$44,394
5770 -Acute Pancreatitis	5	$43,127
1541 -Malignant Neopl Rectum	1	$40,860
V553 -Atten to Colostomy	4	$30,665
V552 -Atten to Ileostomy	2	$28,020
1540 -Mal Neo Rectosigmoid Jct	2	$27,486
5582 -Toxic Gastroenteritis	2	$24,804
41402-Crn Ath Atlg Vn Bps Grft	1	$24,222
71536-Loc Osteoarth NOS-L/Leg	1	$23,810
71596-Osteoarthros NOS-L/Leg	2	$23,810
71595-Osteoarthros NOS-Pelvis	2	$23,303
Top 10	61	$719,192
Grand Total	154	$1,537,711

DRGlabel	N	Amount
847-Chemotherapy w/o acute leukemia as s	12	$103,009
406-Pancreas, liver & shunt procedures w C	9	$102,350
470-Major joint replacement or reattachmen	6	$85,093
314-Other circulatory system diagnoses w M	5	$79,098
389-G.I. obstruction w CC	5	$71,568
394-Other digestive system diagnoses w CC	6	$61,091
390-G.I. obstruction w/o CC/MCC	8	$60,502
336-Peritoneal adhesiolysis w CC	5	$51,967
683-Renal failure w CC	6	$46,800
315-Other circulatory system diagnoses w C	2	$45,195
345-Minor small & large bowel procedures w	4	$42,030
987-Non-extensive O.R. proc unrelated to p	1	$40,860
820-Lymphoma & leukemia w major O.R. pr	1	$38,862
405-Pancreas, liver & shunt procedures w M	2	$36,932
392-Esophagitis, gastroent & misc digest di	3	$31,878
375-Digestive malignancy w CC	3	$29,888
237-Major cardiovasc procedures w MCC o	1	$27,744
438-Disorders of pancreas except malignan	1	$25,650
249-Perc cardiovasc proc w non-drug-elutin	1	$24,222
354-Hernia procedures except inguinal & fe	3	$21,658
Top 10	64	$706,673
Grand Total	154	$1,537,711

Colon Cancer Treatment-related Drug Costs by Therapeutic Class

- Note: Drugs compose 2.1% of total episode costs

Therapeutic Class	N	Amount	% of N	% of Amount
021-Antineoplastic Agents, NEC	385	$509,410	8.0%	51.1%
160-Antiemetics, NEC	936	$218,756	19.6%	22.0%
042-Hematopoietic Agents, NEC	27	$133,757	0.6%	13.4%
069-Psychother, Antidepressants	811	$73,143	17.0%	7.3%
060-Anal/Antipyr, Opiate Agonists	1625	$33,539	34.0%	3.4%
059-Analg/Antipyr, Nonsteroid/Antiinflar	232	$10,224	4.9%	1.0%
074-ASH, Benzodiazepines	541	$9,881	11.3%	1.0%
062-Analgesics/Antipyretics, NEC	80	$2,163	1.7%	0.2%
153-Cath & Lax, Laxatives, Enemas	47	$1,448	1.0%	0.1%
999-Other/unavailable	51	$1,367	1.1%	0.1%
026-Antichol/Antimuscarinic/Antispas	5	$1,323	0.1%	0.1%
064-Anticonvulsants, Benzodiazepines	35	$947	0.7%	0.1%
058-Analg/Antipyr, Salicylates	8	$305	0.2%	0.0%
Grand Total	4783	$996,264	100.0%	100.0%

Non-related Drug Costs, Colon Cancer Treatment Episode

Therapeutic Class	N	Amount	% of N	% of Amount
053-Antihyperlipidemic Drugs, NEC	1230	$155,023	8.1%	14.4%
162-Gastrointestinal Drugs Misc, NEC	879	$135,504	5.8%	12.6%
174-Antidiabetic Agents, Misc	632	$65,197	4.2%	6.1%
039-Coag/Anticoag, Anticoagulants	571	$64,486	3.8%	6.0%
046-Cardiac Drugs. NEC	615	$45,547	4.0%	4.2%
234-Unclassified Agents, NEC	370	$42,954	2.4%	4.0%
052-Cardiac, Calcium Channel	562	$41,298	3.7%	3.8%
047-Cardiac, ACE Inhibitors	887	$33,982	5.8%	3.2%
075-Anxiolytic/Sedative/Hypnotic NEC	349	$28,687	2.3%	2.7%
068-Anticonvulsants, Misc	202	$26,926	1.3%	2.5%
172-Antidiabetic Agents, Insulin	167	$26,363	1.1%	2.4%
016-Quinolones, NEC	399	$26,333	2.6%	2.4%
051-Cardiac, Beta Blockers	908	$26,209	6.0%	2.4%
001-Antihistamines & Comb, NEC	478	$24,433	3.1%	2.3%
045-Antiplatelet Agents, NEC	144	$21,711	0.9%	2.0%

Colon Cancer Provider Attribution

- Identify the provider or providers “responsible” for the patient’s care during the course of an episode
- Support a comparison across providers rather than simply across all episodes, which may be reflective of a normal distribution of costs population-wide

Colon Cancer Attribution Methodogy

- If they do *not* receive chemotherapy, the episode is attributed to the surgeon.

- If they receive chemotherapy…
  - the resource use up through the first 6 weeks (42 days) following colectomy are attributed to the surgeon
  - the resource use from day 43 through the end of the measurement period is attributed to the oncologist with the most E&M visits.

Colon Cancer Treatment Episode Without Chemotherapy: Attributed to the Surgeon

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
IP Facility Costs	$14,837	54.7%	$2,712	$10,525	$12,882	$17,193	$31,315
OP Facility Costs	$4,260	15.7%	$0	$0	$0	$1,350	$10,950
E & M - IP	$15	0.1%	$0	$0	$0	$0	$0
E & M - OP	$681	2.5%	$0	$161	$425	$949	$2,129
Surgery - Colectomy	$2,935	10.8%	$1,608	$1,628	$2,036	$2,766	$5,651
Chemotherapy	$7	0.0%	$0	$0	$0	$0	$0
Procedures	$2,396	8.8%	$0	$1,108	$1,869	$2,693	$5,689
Imaging	$648	2.4%	$0	$0	$218	$755	$3,167
Tests	$435	1.6%	$0	$220	$375	$608	$1,091
Durable Medical Equipment	$63	0.2%	$0	$0	$0	$0	$0
Other Services	$41	0.2%	$0	$0	$0	$0	$3
Unclassified	$66	0.2%	$0	$0	$0	$0	$0
Drug Charges	$754	2.8%	$0	$6	$21	$229	$4,720
Sum of costs	**$27,138**	**100.0%**	**$8,890**	**$16,480**	**$21,718**	**$28,699**	**$59,844**

N=1,091

Colon Cancer Treatment Episode With Chemotherapy: Attributed to Surgeon and Oncologist

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
IP Facility Costs	$19,788	16.5%	$6,315	$11,820	$14,484	$19,312	$47,650
OP Facility Costs	$4,223	3.5%	$0	$0	$0	$3,661	$16,860
E & M - IP	$81	0.1%	$0	$0	$0	$0	$478
E & M - OP	$2,846	2.4%	$813	$1,605	$2,338	$3,333	$5,844
Surgery - Colectomy	$2,666	2.2%	$1,608	$1,628	$2,036	$2,716	$4,735
Chemotherapy	$73,436	61.2%	$259	$24,632	$52,353	$78,649	$151,840
Procedures	$6,297	5.2%	$1,879	$3,752	$4,994	$7,377	$14,634
Imaging	$2,260	1.9%	$17	$411	$1,263	$3,331	$7,109
Tests	$1,312	1.1%	$262	$680	$1,102	$1,567	$2,576
Durable Medical Equipment	$1,508	1.3%	$0	$0	$972	$2,230	$5,410
Other Services	$2,954	2.5%	$0	$135	$624	$2,896	$15,664
Unclassified	$392	0.3%	$0	$0	$0	$0	$2,281
Drug Charges	$2,221	1.9%	$3	$41	$364	$1,497	$6,799
Sum of costs	**$119,985**	**100.0%**	**$26,942**	**$67,585**	**$93,400**	**$127,931**	**$223,658**

N=752

Identifying Variability in Colon Cancer Treatment Resource Use

- Analyses intended to identify trends in the observed variability in resource use for colon cancer episodes
- Variability measured at the following levels:
  - With and without chemotherapy
  - Specialty

Colon Cancer Treatment Episode, Related Resource Use by Type of Service:

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
IP Facility Costs	$16,873	25.8%	$4,168	$10,525	$13,790	$17,730	$37,230
OP Facility Costs	$4,245	6.5%	$0	$0	$0	$2,078	$13,890
E & M – IP	$42	0.1%	$0	$0	$0	$0	$107
E & M – OP	$1,571	2.4%	$0	$329	$1,049	$2,238	$4,558
Surgery - Colectomy	$2,825	4.3%	$1,608	$1,628	$2,036	$2,716	$5,233
Chemotherapy	$30,199	46.2%	$0	$0	$0	$43,779	$111,752
Procedures	$4,000	6.1%	$293	$1,636	$2,726	$4,903	$11,158
Imaging	$1,311	2.0%	$0	$37	$451	$1,518	$5,839
Tests	$795	1.2%	$0	$303	$578	$1,066	$2,158
Durable Medical Equipment	$657	1.0%	$0	$0	$0	$648	$3,389
Other Services	$1,239	1.9%	$0	$0	$0	$402	$8,567
Unclassified	$200	0.3%	$0	$0	$0	$0	$1,661
Drug Charges	$1,357	2.1%	$0	$10	$56	$683	$6,447
Sum of charges	**$65,314**	**100.0%**	**$11,988**	**$19,570**	**$30,651**	**$87,013**	**$187,998**

Colon Cancer Treatment Episode, Related Resource Use by Provider Type: Surgeon

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
IP Facility Costs	$14,977	59.4%	$2,712	$10,525	$13,790	$17,161	$30,058
OP Facility Costs	$1,102	4.4%	$0	$0	$0	$983	$5,648
E & M - IP	$31	0.1%	$0	$0	$0	$0	$65
E & M - OP	$734	2.9%	$0	$204	$485	$918	$2,224
Surgery - Colectomy	$2,791	11.1%	$1,608	$1,628	$2,036	$2,698	$4,776
Chemotherapy	$1,663	6.6%	$0	$0	$0	$0	$8,368
Procedures	$2,618	10.4%	$176	$1,290	$2,016	$2,991	$6,831
Imaging	$510	2.0%	$0	$0	$218	$679	$2,430
Tests	$473	1.9%	$0	$233	$401	$614	$1,194
Durable Medical Equipment	$56	0.2%	$0	$0	$0	$0	$325
Other Services	$77	0.3%	$0	$0	$0	$0	$291
Unclassified	$45	0.2%	$0	$0	$0	$0	$38
Drug Charges	$131	0.5%	$0	$4	$14	$52	$499
Sum of costs	**$25,208**	**100.0%**	**$10,328**	**$16,748**	**$22,093**	**$28,973**	**$49,265**

Colon Cancer Treatment Episode, Related Resource Use by Provider Type: Oncologist

Description	Mean	% of Total	5th %	25th %	50th %	75th %	95th %
IP Facility Costs	$1,823	4.6%	$0	$0	$0	$0	$9,084
OP Facility Costs	$3,142	7.8%	$0	$0	$0	$424	$9,462
E & M - IP	$12	0.0%	$0	$0	$0	$0	$0
E & M - OP	$837	2.1%	$0	$45	$368	$1,174	$2,926
Surgery - Colectomy	$33	0.1%	$0	$0	$0	$0	$0
Chemotherapy	$28,537	71.3%	$0	$0	$0	$40,778	$107,919
Procedures	$1,382	3.5%	$0	$0	$426	$1,848	$5,465
Imaging	$801	2.0%	$0	$0	$0	$877	$4,043
Tests	$322	0.8%	$0	$0	$77	$457	$1,193
Durable Medical Equipment	$601	1.5%	$0	$0	$0	$486	$3,111
Other Services	$1,162	2.9%	$0	$0	$0	$338	$8,135
Unclassified	$155	0.4%	$0	$0	$0	$0	$1,114
Drug Charges	$1,226	3.1%	$0	$0	$31	$557	$5,752
Sum of costs	**$40,034**	**100.0%**	**$0**	**$378**	**$4,204**	**$56,934**	**$144,822**

Risk Adjustment

- Colon Cancer Treatment episode was not risk adjusted due to low number of episodes.