NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR IMAGING EFFICIENCY: A CONSENSUS REPORT

FINAL REPORT

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EXECUTIVE SUMMARY

According to the Centers for Medicare and Medicaid Services (CMS), expenditures on healthcare costs have continued to escalate at rates that far outpace inflation. Recent data from CMS shows expenditures on healthcare in the United States are projected to surpass $2.5 trillion in 2009, more than three times spent in 1990. By 2019, CMS projects national health spending will reach $4.5 trillion and comprise 19.3 percent of the U.S. gross domestic product (GDP), though it is unclear that this increased spending will yield improved health outcomes.

Outpatient imaging is a critical component of today's healthcare delivery system, with important applications in establishing diagnoses, prognosis, and monitoring therapy. Despite the benefits of imaging technology, recent reports from the Government Accountability Office (GAO) point to the need for caution as we witness immense growth in the volume and intensity of imaging services. Research from the GAO's 2008 Annual Report state within Medicare alone, expenditures for imaging services more than doubled from 2000 to 2006. Further, the number of imaging services provided varied substantially (up to three-fold) across the country, signaling the potential presence of overuse.

To achieve quality and improve the efficiency in the delivery of imaging services, there is a need to publicly report measures on the appropriate and efficient use of imaging procedures in outpatient settings. The goal of this consensus standards project is to promote the appropriate use of outpatient imaging services, thus, avoiding redundancy and unnecessary exposure to radiation, reducing the use of painful and wasteful follow-up procedures, and ensuring that patients get the right healthcare service the first time.

To date, NQF has endorsed a limited number of imaging efficiency measures focused on the appropriateness or efficiency of imaging services. The current imaging efficiency project seeks to bolster the 2009 report by identifying and endorsing additional measures related to the appropriateness and efficiency of outpatient imaging at the clinician and facility/agency levels for public reporting and quality improvement.

NATIONAL VOLUNTARY CONSENSUS STADARDS FOR IMAGING EFFICIENCY: A CONSENSUS REPORT

This report present sevenNQF-endorsed® consensus standards and a number of research and measure development recommendations regarding the appropriateness and efficiency of outpatient imaging services.

- IEP-005-10 Pulmonary CT imaging for patients at low risk for pulmonary embolism
- IEP-007-10 Appropriate head CT imaging in adults with mild traumatic brain injury
- IEP-010-10 Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery
- IEP-008-10 Cervical Spine Radiography and CT Imaging in Trauma
- IEP-014-10Cardiac stress imaging not meeting appropriate use criteria: preoperative evaluation in low risk surgery patients
- IEP-015-10 Cardiac stress imaging not meeting appropriate use criteria: routine testing after percutaneous coronary intervention (PCI)
- IEP-016-10 Cardiac stress imaging not meeting appropriate use criteria: testing in asymptomatic, low risk patients

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BACKGROUND

Healthcare costs have continued to escalate at rates that far outpace inflation. Expenditures on healthcare in the United States are projected to surpass $2.5 trillion in 2009 more than three times thatspent in 1990.[1]Current projections estimate that by 2019, national health spending will reach $4.5 trillion and comprise 19.3 percent of GDP,[2] though it is unclear that this increase will yield improved health outcomes.

Outpatient imaging is a critical component of today's healthcare delivery system, with important applications in establishing diagnoses and prognoses and monitoring therapy. Cutting-edge imaging technologies help diagnose and treat life-threatening disease, such as cancer, allow for earlier diagnosis, and reduce the need for more invasive surgical or other procedures. Despite the benefits of imaging technology, recent reports point to the need for caution as the volume and intensity of services experience a boom in growth without proof of desirable patient outcomes.[3]

A core challenge for policy makers and providers of care is how to increase quality and improve the efficiency of the delivery system. Imaging services represent a major cost driver of today's healthcare delivery systemwith recent trends in imaging practices and cost growth gaining national attention. In 2008, two-thirds of spending on imaging services occurred in a physician office setting indicating a shift away from the provision of such services from the traditional hospital or other institutional based setting.[4]This shift signals a need for measures of quality and efficiency to reflect the changing care setting. Despite a reversal in spending for physician imaging services in 2007 by 12.7 percent from 2006, Medicare spending on advanced medical imaging modalities (computed tomography, magnetic resonance imaging and nuclear medicine) continues to grow at a rapid rate, when compared to the growth of spending among less advanced imaging modalities (ultrasound and X-rays).[5]Furthermore, the MedPAC report found that the number of imaging services provided varied substantially (up to three-fold) across the country, signaling the potential presence of overuse.[6] Despite the important role of outpatient imaging, few national standards exist to address variations in delivery practices, define quality outcomes related to the use of imaging, or allow for the measurement of these services.

To achieve quality and improve the efficiencyin the delivery of imaging services, there is a growing need to publicly report measures on the appropriate and efficient use of imaging procedures in outpatient settings. The goal of this consensus standards project is to promote the appropriate use of outpatient imaging services, thus avoiding redundancy and unnecessary exposure to radiation, reducing the use of painful and wasteful follow-up procedures, and ensuring that patients get the appropriate healthcare service the first time. These strategies have the potential to improve both the quality and affordability of healthcare.

Efficiency has historically been difficult to measure, with varying definitions of "efficiency" further compounding the healthcare arena's adoption of or moves to efficiency standards. Most recently, a report prepared for the Agency for Healthcare Research and Quality (AHRQ) on the typology of efficiency measures defined efficiency as an attribute of performance that is measured by examining the relationship between a specific product of the healthcare system (an output) and the resources used to create that product (an input).[7] This definition allows for the health service outputs to be defined with reference to quality criteria.The National Quality Forum (NQF)Measurement Framework: Evaluating Efficiency Across Patient-Focused Episodes of Care, which predated the AHRQ prepared report, adopted the Ambulatory Care Quality Alliance(AQA) definition for efficiency and further emphasized that the purpose of the healthcare delivery system is "to improve health, reduce the burden of illness, and maximize the value of individual and societal resources allocated to health care."[8]

Assessing the quality and value of care delivered in relation to resources usedis vital when evaluating efficiency. Practices or procedures thatconsume fewer resources but yield a lower quality or value of care may be considered inefficient compared to those practices or procedures thatuse more resources but produce a higher quality and value of care.

STRATEGIC DIRECTIONS FOR NQF

NQF's mission includes three parts: 1) setting national priorities and goals for performance improvement, 2) endorsing national consensus standards for measuring and publicly reporting on performance, and 3) promoting the attainment of national goals through education and outreach programs. As greater numbers of quality measures are developed and brought to NQF for consideration of endorsement, it is incumbent on NQF to assist stakeholders to "measure what makes a difference" and address what is important to achieve the best outcomes for patients and populations. For more information seewww.qualityforum.org/projects/imaging_efficiency.aspx.

Several strategic issues have been identified to guide consideration of candidate consensus standards:

DRIVE TOWARD HIGH PERFORMANCE. Over time, the bar of performance expectations should be raised to encourage achievement of higher levels of system performance.

EMPHASIZE COMPOSITES. Composite measures provide much needed summary information pertaining to multiple dimensions of performance and are more comprehensible to patients and consumers.

MOVE TOWARD OUTCOME MEASUREMENT. Outcome measures provide information of keen interest to consumers and purchasers, and when coupled with healthcare process measures, they provide useful and actionable information to providers. Outcome measures also focus attention on much-needed system-level improvements, since achieving the best patient outcomes often requires carefully designed care process, teamwork, and coordinated action on the part of many providers.

CONSIDER DISPARITIES IN ALL THAT WE DO. Some of the greatest performance gaps relate to care of minority populations. Particular attention should be focused on identifying disparities-sensitive performance measures and on identifying the most relevant race/ethnicity/language strata for reporting purposes.

NATIONAL PRIORITIES PARTNERSHIP

NQF seeks to endorse measures that address the National Priorities and Goals of the NQF-convened National Priorities Partnership. The National Priorities Partnership represents those who receive, pay for, provide, and evaluate healthcare. The National Priorities and Goals focus on these areas:

- patient and family engagement,
- population health,
- safety,
- care coordination,
- palliative and end-of-life care, and
- overuse.

NQF AND THE EFFICIENCY LANDSCAPE

In 2007, NQF took the initial steps in standardizing measures to address the appropriateness of diagnostic imaging services with the endorsement of five voluntary consensus standards. The project endorsed three measures for the appropriate use of imaging services for low back pain and two measures for use of imaging for patients with stroke. In April 2008, NQF launched the first NQF Outpatient Imaging Efficiency Project to further address appropriate and efficient use of diagnostic imaging in the outpatient setting. The project endorsed eight imaging efficiency measures at the practitioner and facility/agency level that relate to the appropriateness and efficiency of imaging services, including both the cost of imaging servicesand the related quality of care.[9]

In 2009, NQF published the report *Measurement Framework: Evaluating Efficiency Across Patient-Focused Episodes of Care*. The report produced the NQF-endorsed® measurement framework for evaluating efficiency and ultimately value, across patient-focused episodes of care. The report ultimately produced nine guiding principles to be applied when evaluating efficiency within the healthcare system. Specifically:

- Principle 1: Efficiency measurement is multidimensional.
- Principle 2: Choice of measures to inform judgment on efficiency should include consideration of potential leverage.
- Principle 3: Measures used to inform judgment on efficiency should promote shared accountability across providers and should be assigned to the smallest unit of accountability as technically feasible.
- Principle 4: Measures used to inform judgments on efficiency should respond to the need to harmonize measurement across settings of care.
- Principle 5: Measures to inform judgments on efficiency should be used for benchmarking.
- Principle 6: Public reporting of measures of efficiency should be meaningful and understandable to consumers and entities accountable for their care.
- Principle 7: Inappropriate care cannot be efficient.
- Principle 8: The measurement framework should achieve its intended purpose and should be monitored for unintended consequences.
- Principle 9: Measures to inform judgments on efficiency should be an integral part of a continuous learning system.

The National Priorities Partnership, of which NQF is a convener and one of the 32 members, set a national agenda for efficiency when it delineated the reduction in waste as one of four major challenges important to improving the American healthcare system. The Partnership identified six priority areas critical to improving the quality and value of the healthcare delivery system, one of which focuses on the elimination of overuse while ensuring the delivery of appropriate care.

The Partnershipreport targeted specific areas of potential unwarranted diagnostic procedures, including:

- cardiac computed tomography (noninvasive coronary angiography and coronary calcium scoring);

- lumbar spine magnetic resonance imaging prior to conservative therapy, without red flags;
- uncomplicated chest/thorax computed tomography screening;
- bone or joint x-ray prior to conservative therapy, without red flags; and
- chest x-ray, preoperative.

To date, NQF has endorsed a limited number of imaging efficiency measures focused on the appropriateness or efficiency of imaging services. The current imaging efficiency project seeks to bolster the 2009 report, by identifying and endorsing additional measures related to the appropriateness and efficiency of outpatient imaging at the clinician and facility/agency levels for public reporting and quality improvement. While the imaging field is expansive, the scope of this project focused on imaging efficiency in the outpatient setting. Specific outpatient imaging efficiency measurement domains central to this project included:

- screening;
- patient safety;
- negative studies;
- non-contrast imaging of the same body part using same imaging modality followed by, but on a separate occasion, with contrast imaging of adjacent body parts;
- coordination of care;
- overlap; and
- duplication.

SCOPE OF THE IMAGING EFFICIENCY PROJECT

NQF's National Voluntary Consensus Standards for Imaging Efficiency project[13] seeks to identify and endorse measures for public reporting and quality improvement related to resource use and care coordination for hospital imaging.

NQF'S CONSENSUS DEVELOPMENT PROCESS (CDP)

Evaluating Potential Consensus Standards

Candidate standards were solicited through an open Call for Measures in December 2009 and searched through the National Quality Measures Clearinghouse. A total of 17 measures were submitted to the project and evaluated by the Outpatient Imaging Efficiency Steering Committee for appropriateness as voluntary consensus standards for accountability and public reporting. The Steering Committee evaluated the candidate consensus standards using NQF's standard evaluation criteria: importance, scientific acceptability, usability, and feasibility. (See the NQF Development Process page for more details on evaluating potential consensus standards. http://www.qualityforum.org/uploadedFiles/Quality_Forum/Measuring_Performance/Consensus_Development_Process%E2%80%99s_Principle/EvalCriteria2008-08-28Final.pdf?n=4701.)

This report presents the 17 performance measures that were submitted to NQF for endorsement. They comprise the following areas:

- appropriateness of imaging, including measures that address potential overuse of certain imaging studies and appropriateness of referrals for imaging;
- efficient use and management of imaging diagnostic services (e.g., x-ray, magnetic resonance imaging, tomography, mammography);
- coordination of care and communication among all providers/departments regarding a diagnostic imaging service, including the appropriateness of the study and timely follow-up of abnormal results; and
- measures suitable for clinician and facility/agency-level analysis.

RECOMMENDATIONS FOR ENDORSEMENT

This report presents the results of the evaluation of 17 measures considered under NQF's Consensus Development Process(CDP). Seven measures are recommended for endorsement as National Voluntary Consensus Standards suitable for public reporting and quality improvement.

Candidate Consensus Standards Recommended for Endorsement

IEP-005-10 Pulmonary CT imaging for patients at low risk for pulmonary embolism (PE)(Brigham and Women's Hospital)*Percent of patients undergoing CT pulmonary angiogram for the evaluation of possible PE who have a documented indication consistent with guidelines prior to CT imaging.*

This clinician, facility/agency, population level, and programmeasure assesses the rate of patients undergoing CT pulmonary angiogram (CTPA) for the evaluation of possible pulmonary embolism (PE), who have a documented indication consistent with guidelines prior to the actual CT imaging. Every year, over ten million people in the United States present with chest pain or breathing difficulties, the main symptom of PE.[10] While exact prevalence of PE is unknown, evidence suggests that 1 in every 500 to 1 in every 1000 emergency department (ED) patients has a PE.[11] Recent advancement in technology, including D-dimer serological testing and CTPA have resulted in significant changes in U.S. practice with CTPA being considered the definitive test for PE.[12] This measure aims to improve imaging efficiency within the outpatient setting by reducing the inappropriate ordering of CTPA for pulmonary embolisms, by guiding clinical practice towards the use of initial D-dimer testing rather than deferring immediately to CTPA for suspicion of a PE. In addition to improving efficiency, the measure also has tangible implications for patient safety as ionizing radiation from CTPA can increase the lifetime risk of cancer, particularly in young women.[13]

The Steering Committee acknowledged the value of the measure and believed it was best suited as an "overuse" measure rather than strictly as an "efficiency" measure.In changing the measure to an overuse measure the developer was able to amend the numerator specifications, specifically relating to the D-dimer. According to the Steering Committee's recommendations the measure developer updated the numerator specificationsto read: "number of hemodynamically stable patients who receive CT pulmonary angiograms for suspected pulmonary embolism who have either:

- a low clinical probabilityof PE and a negative D-dimer

OR

- a low clinical probability of PE and no D-dimer performed

OR

- no documentation of a pre-test probability."

The Committee was agreeable to the update and noted the importance of requiring a pre-test probability score as part of the pre-test assessment to prevent biases, because those who do not have a pre-test risk assessment would not be included in the measure.

The Steering Committee noted challenges in the feasibility of the measure as specified because it was based on and tested using aproprietary electronic data collection tool used at the Brigham and Women's Hospital. The measure developers consequently specified a paper data collection tool to accompany the measure; the paper tool will be publicly available.The Committee felt the measure was of great value and would help improve the efficiency of pulmonary CT imaging. Because the paper data collection tool as specified has not been tested, the Steering Committee recommended the measure for time-limited endorsement.

IEP-007-10 Appropriate head CT imaging in adults with mild traumatic brain injury (Brigham and Women's Hospital)*Percent of adult patients who presented within 24 hours of a non-penetrating head injury with a Glasgow coma score (GCS) >13 and underwent head CT for trauma in the ED who have a documented indication consistent with guidelinesprior to imaging.*

This clinician, facility/agency, or population level measure aims to evaluate the rate of adult patients presenting to the ED within 24 hours of a non-penetrating head injury with a Glasgow coma score (GCS) >13, who underwent head computed tomography (CT) for trauma and who have a documented indication consistent with guidelines prior to imaging. The measure uses the American College of Emergency Physicians and the Centers for Disease Control and Prevention guideline, "*Clinical policy: neuroimaging and decision-making in adult mild traumatic brain injury in the acute setting"* (2008).[14]

Head injuries represent a common complaint in U.S., comprising more than 1.8 million cases annually in the ED setting.[15] As technologies have improved and access to CTs has increased, CTs are increasingly used for the evaluation of minor head injuries. This increased use of head CTs for minor head injuries or in low risk patients adds a significant cost to the healthcare system, while yielding few results as a CT scan has only minimal ability to detect intracranial

injury in a low risk patient.[16] Despite the significant cost, variations in the use of CT scans have been identified.[17] This measure aims to use previously standardized and evidence-based clinical decisions to reduce unnecessary CT scans and improve imaging efficiency in the ED setting.

The Steering Committee agreed that the measure is based on strong evidence-based guidelines and targets a critical imaging practice in the ED setting. The Committee initially debated the inclusion criteria of GCS >13 (as specified) verses an alternative inclusion criteriaof GCS ≥13. The measure developer responded with a rationale for the GCS>13 criteria being representative of the most recent evidence-based guidelines, to which the Committee was agreeable.

As with other measures submitted by the Brigham and Women's Hospital, the Steering Committee had concerns regarding the feasibility of the measure as it is based onand tested using a proprietary electronic data collection system. The measure developer supplied a paper format of the data collection tool to be used at facilities without the proprietary electronic system. While the paper format presents some challenges, specifically regarding the feasibility of the measure, the Committee felt the measure was of great value and would help improve the efficiency of head CT imaging. Because the paper data collection tool as part of the specification has not been tested, the Steering Committee recommended the measure for time-limited endorsement.

IEP-010-10 Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery (Centers for Medicare and Medicaid Services)*This measure calculates the percentage of lowrisk, non-cardiac surgeries performed at a hospital outpatient facility with a Stress Echocardiography, SPECT MPI or Stress MRI study performed in the 30 days prior to the surgery at a hospital outpatient facility (e.g., endoscopic, superficial, cataract surgery, and breast biopsy procedures).*

This facility/agency, clinician, population, hospital outpatient imaging efficiency level measure assesses the rate of lowrisk, non-cardiac surgeries performed at a hospital outpatient facility where a stress echocardiography, single photon emission computed tomography (SPECT),myocardial perfusion imaging (MPI) or stressMagnetic Resonance Imaging (MRI) study was performed 30 days prior to surgery. The use of SPECT MPI in the Medicare population has substantially increased in recent years. Between 1998 and 2006, the rate of MPI use in theMedicare population increased 51 percent among cardiologists in the hospital setting,

and by 215 percent in private offices.[18] Further analysis at the Mayo Clinic Rochester in May 2005 found that of all SPECT MPI procedures performed 14 percent were considered inappropriate and 11 percent were of uncertain appropriateness using the criteria published by the American College of Cardiology Foundation and the American Society of Nuclear Cardiology.[19] The use of SPECT MPI and stress MRI in the hospital outpatient setting represents a key area for resource use containment and potential cost control while improving the value and safety of care provided to patients.

The Steering Committee acknowledged that this measure targets a major problem area in the outpatient imaging arena where there are significantly high rates of inappropriate testing. The Committee further noted that the measure was highly feasible because it uses administrative data only. The Steering Committee voiced concern regarding the potential for misclassification and small sample sizes. The measure developers responded that while misclassification was possible, the focus of the measure is the outliers, which will be captured in the measure. Further, based on empirical data previously submitted by the measure developer, the Committee determined that, while the sample sizes may be small, the outliers alone are meaningful to measure.

The initial measure submission is specified for use at hospital-based outpatient facilities only. The Steering Committee requested the measure developers consider other settings of care; the measure developer agreed to include all outpatient imaging, as a substantial percentage of imaging occurs outside of the hospital outpatient setting.

A similar measure was submitted (IEP-014-10 Cardiac stress imaging not meeting appropriate use criteria: Preoperative evaluation in low risk surgery patients), both examining cardiac stress imaging not meeting appropriate use criteria.The Committee reviewed both measures and determined that while they have similar constructs there were some important distinctions. The Committee worked with both measure developers (CMS and the ACC) to align their list of "low-risk surgeries" specified in each measure.Aligning themeasures list of "low-risk surgeries" improves public reporting, interpretability, and dissemination of the measures and their results. Both measure developers were agreeable to aligning their list of "low-risk surgeries." The Steering Committee recommended the measure for endorsement based on the importance of the measure in targeting a major problem area in the outpatient imaging arena.

IEP-014-10 Cardiac stress imaging not meeting appropriate use criteria: preoperative evaluation in low risk surgery patients (American College of Cardiology)*Percentage of stress SPECT MPI and stress echo performed in low risk surgery patients for preoperative evaluation.*

This facility/agency level measure assesses the rate of inappropriate stress SPECT MPI and stress echocardiograms performed in low risk surgery patients for preoperative evaluation. While cardiac imaging has become a primary decision making tool for patients with known or suspected heart disease, concerns have arisen regarding the substantial geographic variation in ordering patterns and the limited amount of evidence-based data supporting the use of imaging as it relates to patient outcomes.[20] Given the prevalence of cardiovascular disease and the subsequent rise in cardiac imaging expenditures, it is critical to determine the appropriate use of diagnostic tests specifically stress SPECT MPI, in order to improve efficiencies and reduce potential undue harm towards patients. The measure attempts to resolve both the cost and quality issue surrounding inappropriate use of SPECT MPI and stress echocardiograms performed in low risk surgery patients as inappropriate care leads to both higher costs and poorerquality of care.

The Steering Committee determined that the measure targets a critical imaging area with significant opportunities to improve efficiency. Some members of the Committee noted that this measure addresses an imaging area with very high rates of inappropriate testing, which is of particular interest to purchasers. The Steering Committee had concerns about whether the testing of the measures to date was sufficient, denominator exclusions, and its narrow scope.

The Committee requested the measure developer expand the sampling period from 60 days (2 months) to one year (12 months) due to concerns aboutwhether facilities would have large enough sample sizes for reporting. The ACC presented data from the SPECT MPI pilot indicating that a 60-day sampling period would be sufficient for facilities to generate the necessary sample size required to publicly report the measure. The ACC SPECT MPI pilot found:

> Six sites participated in this pilot study: three urban, two suburban, and one rural location. Practices were located in Florida, Wisconsin, Oregon, and Arizona, and the

number of cardiologists at each site ranged from 7 to 20 physicians. The number of SPECT MPI patients submitted from each site varied from 328 to 1,597 patients.

Based on this additional information, the Committee dropped the request to expand the sampling time frame.

The Committee requested the measure developers remove the specified denominator exclusion criteria: "patients without sufficient patient selection criteria recorded." The Committee was concerned that this exclusion would create an unintended incentive for individuals not to record criteria. The ACC agreed to remove the identified exclusion criteria.

The Committee requested expansion of the scope to include stress MRI and coronary computed tomography angiography (CTA). The ACC agreed to expand the measure scope.

A similar measure was submitted (IEP-010-10 Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery), both examining cardiac stress imaging not meeting appropriate use criteria.The Committee reviewed both measures and determined that while they have similar constructs there were some important distinctions. The measure developers (ACCand CMS) alignedtheir respective lists of "low-risk surgeries" specified in each measure. Aligning the lists of "low-risk surgeries" improves public reporting, interpretability, and dissemination of the measures and their results. Both measure developers were agreeable to aligning their list of "low-risk surgeries." The Steering Committee recommended the measure for endorsement.

IEP-015-10 Cardiac stress imaging not meeting appropriate use criteria: routine testing after percutaneous coronary intervention (PCI) (American College of Cardiology)*Percentage of all stress SPECT MPI and stress echo performed routinely after PCI, with reference to timing of test after PCI and symptom status.*

This facility/agency level measure assesses the rate of all stress SPECT MPI and stress echocardiograms performed routinely after PCI with the aim to improve efficiencies and achieve cost control. With the increased use of cardiac imaging modalities in recent years, concerns have arisen regarding the substantial geographic variation in ordering patterns and the limited amount

of evidence-based data supporting the use of imaging as it relates to patient outcomes.[21] The measure focuses on the inappropriate use of SPECT MPI and stress echocardiograms post PCI.

The Steering Committee determinedthat the measure targets a critical imaging area with significant opportunities to improve efficiency in an expanding and changing field. The Committee requested the measure developer remove the denominator exclusion criteria, "patients without sufficient patient selection criteria recorded." The Committee was concerned that such exclusion would create an unintended incentive for individuals to not record criteria to improve their measure performance. The ACC agreed to remove the identified exclusion criteria. The Committee requestedthe measure developers consider an expansion of the denominator population to include coronary artery bypass graft (CABG). The ACC stated that inclusion of CABG would not be appropriate for the denominator; it has a different timeframe for follow-up testing, the procedure is generally performed in more complex patients, and testing may actually be appropriate in some patients. The Committee agreed with the ACC response.

The Committee challenged the narrow scope of the measure and requested the ACC expand the measure scope to include stress MRI and CTA. The ACC agreed to include stress MRI and CTA in the measure, but stated that the addition will capture only a small portion of imaging modalities for the target population. The Committee accepted these additions. The Steering Committee recommended the measure for endorsement.

IEP-016-10/ Cardiac stress imaging not meeting appropriate use criteria: testing in asymptomatic, low risk patients (American College of Cardiology) *Percentage of all stress SPECT MPI and stress echocardiograms performed in asymptomatic, low coronary heart disease (CHD)risk patients for initial detection and risk assessment.*

This facility/agency level measure aims to assess the rate of stress SPECT PMI and stress echocardiograms performed in asymptomatic, low CHD risk patients for initial detection and risk assessment. While cardiac imaging has become a primary decision-making tool for patients with known or suspected heart disease, concerns have arisen regarding the substantial geographic variation in ordering patterns and the limited amount of evidence-based data supporting the use of imaging as it relates to patient outcomes.[22] Given the prevalence of cardiovascular disease and

the subsequent rise in cardiac imaging expenditures, it is critical to determine the appropriate use of diagnostic tests, specifically stress SPECT MPI in order to improve efficiencies and reduce potential undue harm towards patients. The measure attempts to resolve both the cost and quality issue surrounding inappropriate use of SPECT MPI and stress echocardiograms performed in asymptomatic, low CHD risk patients.

The Steering Committee stated concerns with the measure's denominator exclusion criteria, perceived lack of risk adjustment, and narrow scope. The Committee requested the measure developers remove the specified denominator exclusion criteria: "patients without sufficient patient selection criteria recorded." The Committee was concerned that this exclusion would create an unintended incentive for individuals not to record criteria. The ACC agreed to remove the identified exclusion criteria.

The Committee requested expanding the scope to include MRI and coronary computed tomography angiography (CTA). The ACC agreed to expand the measure scope.

The Committee requested that ACC explore the addition of a risk adjustment model. The ACC responded that the measure explicitly considersrisk; specifically, the measure uses a risk calculator model to account for risk. This risk model takes into account two clinical characteristics of the patient—symptom status and global risk for CHD. The latter consists of numerous factors including age, gender, smoking status, blood pressure, lipid profile, and other risk factors. Exclusions for a known history of CHD, pre-op evaluation, and prior testing also are included to ensure that patients who are not being seen for initial evaluation of CHD are excluded. Additional risk adjustments are not required since patient risk is already core to the definition of this measure. The Committee accepted the developer's responses.The Steering Committee recommended the measure for endorsement.

Candidate Consensus Standards Recommended for Time-Limited Endorsement

IEP-008-10 Appropriate cervical spine radiography andCT imaging in trauma (Brigham and Women's Hospital)*Percent of adult patients undergoing cervical spine CT scans for trauma who have a documented evidence-based indication prior to imaging (Canadian C-Spine Rule or the NEXUS Low-Risk Criteria).*

The Steering Committee identified NQF-endorsed® measure 0512, Percentage of patients who do not have neck pain, distracting pain, neurological deficits, reduced level of consciousness, or intoxication (Harborview Medical Center) as being similar to submitted measure IEP-008-10, Appropriate cervical spine CT imaging in trauma (Brigham and Women's Hospital). Consequently, the Committee asked the measure developers to combine the two measures into one measure that incorporates CT imaging of the cervical spine into the endorsed measure. The measure developers successfully combined the two measures and submitted IEP-008-10 with a new name, Appropriate cervical spine radiography and CT imaging in trauma, for evaluation. The Steering Committee recommended this measure for time-limited endorsement; the measure developers will be required to submit testing data and results to NQF within 12 months after endorsement. Given the time needed to address the Steering Committee's request, the final combined measure was added as an addendum to the previous draft report and underwent a separate public and Member comment period.

This clinician, facility/agency, or population level measure assesses whether adult patients who undergo cervical spine CT scans for trauma have documented evidence-based indications prior to imaging (Canadian C-Spine Rule or the NEXUS Low-Risk Criteria). In 2006, more than13 million trauma patients at risk of cervical spine injury presented to EDs across the U.S.[23]Clinical decision rules (NEXUS and Canadian C-spine rule) were developed to identify patients at lowrisk for cervical spine injury and therefore safe to discharge without imaging of the cervical spine. These validated decision rules were meant to improve efficiency and decrease variation in radiography utilization, but remain underutilized.[24]

With the introduction of new technologies (i.e., CT), clinical practice in the U.S. is shifting toward the use ofplainCT rather than radiographysas the initial routine imaging modality in screening for cervical spine injury. This measure aims to ensure that if a CT scan is ordered as the initial imaging modality for patients at low risk of a cervical spine fracture that,(as a minimum standard)the same decision guidelines for radiography should be followed.

The Steering Committee agreed the measure targets an important imaging modality with significant potential for improvement in efficiencies. NQF has a currently endorsed cervical imaging measure related to the use of cervical spine radiographs, thus the Committee suggested that the measure developer work with Harborview Medical Center, the steward of a currently endorsed measure (NQF#0512 "Percentage of patients who do not have neck pain, distracting pain, neurological deficits, reduced level of consciousness, or intoxication") to include CT imaging of the cervical spine in the measure. The endorsed measure follows very similar constructs to the currently submitted measure (IEP-008-10), but focuses on radiographs rather than CT. At this time, both measure developers are working together to combine the two measures into one that would assess the use of cervical spine radiographs or cervical spine CT. The amended measure will be brought back to the Steering Committee when available for review.

Candidate Consensus Standards Not Recommended for Endorsement

Mammography-Related Measures (American College of Radiology)

The American College of Radiology (ACR) submitted a series of mammography-related measures for consideration. The Committee had concerns that any one individual measurecould provide a comprehensive view of mammography for public reporting. The Committee recommended that the measure developer consider options to combine the measures or develop a composite measure that would include: Cancer detection rate (IEP-001-10), Diagnostic mammography positive predictive value 2 (PPV2—biopsy recommended) (IEP-003-10), and Abnormal interpretation rate of screening mammography exams (recall rate) (IEP-004-10). ACR proposed that the measures could becombined; however, the specifications included no guidance or instructions on how the measures would be combined or reported. The Steering Committee recognized that the mammography measures were not currently designed to be a composite measure, but believed there would be value in combining and presenting the measures as a package (e.g., all three should be used together). As part of this request, the Committee requested specification on how the measures were intended to be combined and reported. For example, how should the measures be reported if a facility could only report one or two of the measures,

but not all? ACR later stated that at this timea composite is "premature to publicly report such data until sufficient evidence based guidance has been developed…." With no guidance on how to report the measures as a combined set the Steering Committee was unable to assess and review the measures as a combined measure. The Steering Committee supports ACR's efforts in the development of a combined or composite measure and also suggested that ACR consider age stratification and other risk adjustment models.Given concerns with the lack of guidance on how to present, measure, and publicly report a combined suite of mammography measures the Committee decided to not recommend the measures.

Discussion of the Individual ACR Mammography Measures

IEP-001-10 Cancer detection rate(American College of Radiology)*The percentage of screening mammograms interpreted as positive (BIRADS 0, 4, or 5) that had a tissue diagnosis of cancer within 12 months.*

This clinician, health plan, integrated delivery system, multi-site/corporate chain, program, population orfacility/agency level measure aims to evaluate the rate of screening mammograms interpreted as positive (BIRADS 0, 4, or 5) that have a tissue diagnosis of cancer within 12 months. The Steering Committee acknowledged the value of the measure, but expressed concern that the measure in isolation is not informative for public reporting and quality improvement. Furthermore, the Steering Committee acknowledged the measures may lack meaning or fail to provide actionable information at the facility/agency level. Facilities must have enough breast cancer events to make the measures meaningful, which may pose a potential problem for facilities with too few breast cancer events. Given concerns with the measure's lack of actionable information at the facility/agency level the Committee did not recommend the individual measure, Cancer detection rate (IEP-001-10), for endorsement.

IEP-002-10 Screening mammography positive predictive value 2 (PPV2—biopsy recommended) (American College of Radiology)*Percentage of screening mammograms with abnormal interpretation (BIRADS 0, 4, or 5) that result in a tissue diagnosis of cancer within 12 months. The measure is to be reported annually based on aggregated patient data for mammograms performed 12 to 24 months prior to the reporting date to allow a 12 month follow-up.*

This facility/agency, population, clinician, program level measure aims to evaluate the rate of breast cancer screening recommended for biopsy. A higher rate of screenings recommended for biopsy could reflect inefficient care (e.g., undue harm or resource waste) while a low rate of screenings recommended for biopsy could equate with missed cancers. The Steering Committee noted this measure addressed a very important measurement area, but had challenges in it constructs. The first discrepancy pertaining to the measure was in regards to the measure title, "positive predictive value 2." The Steering Committee indicated the measure should read "positive predictive value 1" according to the specification laid out by the measure developer. While the Steering Committee felt the measure had value, it could not be used in isolation. Given concerns with the measure's lack of actionable information at the facility/agency level the Committee did not recommend the individual measure Screening mammography positive predictive value 2 (PPV2—biopsy recommended) (IEP-002-10) for endorsement.

IEP-003-10 Diagnostic Mammography positive predictivevalue 2 (PPV2—biopsy recommended) (American College of Radiology)*Percentage of diagnostic mammograms recommended for biopsy or surgical consult (BIRADS 4 or 5) that result in a tissue diagnosis of cancer within 12 months. The measure is to be reported annually based on aggregated patient data for mammograms performed 12 to 24 months prior to the reporting date to allow a 12 month follow up.*

This facility/agency, clinician, integrated delivery system, multi-site/corporate chain, program, health plan, and population level measure aims to evaluate the rate of diagnostic mammograms recommended for biopsy or surgical consult (BIRADS 4 or 5) that result in a tissue diagnosis of cancer within 12 months. The Steering Committee noted this measure addressed a very important measurement area; however, concerns were raised regarding the feasibility of the measure as most centers do not have the necessary data. The Committee noted that performing this measure may add extra work to facilities implementing this measurement process. Despite potential limitations, the Committee noted the measure could serve as a standalone measure, though it would be better as part of a combined set. Given concerns with the measure's lack of actionable information at the facility/agency level the Committee did not recommend the individual measure Diagnostic mammography positive predictive value 2 (PPV2—biopsy recommended) (IEP-003-10) for endorsement.

IEP-004-10 Abnormal interpretation rate of screening mammography exams (recall rate) (American College of Radiology) *The percentage of screening mammograms interpreted as positive (BIRADS 0, 4, 5).*

This facility/agency, integrated delivery system, multi-site/corporate chain, clinician, population, and program level measure aims to evaluate the rate of screening mammograms interpreted as positive (BIRADS 0, 4, or 5). While the Committee acknowledged the overall value of the measure, there were significant reservations noted. ACR provided no acceptable or average abnormal interpretation recall rate. With no range and rates varying from 2 percent to 27 percent it is difficult to distinguish quality. Furthermore, the Committee noted there were potentially large unintended consequences as a woman may not know which facility/agency to choose based on the reported rate. The Committee identified additional areas for improvement related to stratification by both age and first and subsequent mammograms. Given concerns with the measure's lack of actionable information at the facility/agency level the Committee did not recommend the individual measure for endorsement.

IEP-009-10 Mammography follow-up rates (Centers for Medicare and Medicaid Services) *This measure calculates the percentage of Medicare patients with mammography screening studies done in the outpatient hospital setting that are followed within 45 days by a diagnostic mammography or ultrasound of the breast study in an outpatient or office setting.*

This clinician, facility/agency, population, program level measure aims to evaluate the rate of Medicare patients with mammography screening studies done in the outpatient hospital setting that are followed up within 45 days by a diagnostic mammography or ultrasound. The Committee acknowledged the measure addresses a critical topic area in the outpatient imaging realm, but had significant reservations about the measure specifications and usability. It was the consensus of the Committee that the measure assesses recall rates; however, the measure does not include a measure thatassesses cancer detection rates. The major concern of the Committee is that a clinician or facility/agency could perform well on this measure by havinglow recall rateswhile simultaneously having a substantial number of missed cancers, highlighting the importance of having both. Members of the Committee encouraged the measure developer to explore further development options that would measure performance for both mammography follow-up rates and cancer detection rates.

The measure developer was agreeable to expanding the scope of the measure and ran tests to validate the accuracy of added current procedural terminology (CPT) codes. Overall the Committee was not concerned with the validity of the codes, but rather that the generation of the measure reflects recall rates alone. Given the concerns and potential unintended consequences the Committee did not recommend the measure for endorsement.

IEP-006-10 Appropriatehead CT imaging in adults with acute atraumatic headache(Brigham and Women's Hospital)*Percent of adults undergoing head CT for acute atraumatic headache who have a documented indication consistent with clinical guidelines.*

This clinician, facility/agency,population, and programlevel measure assess whether adults who undergo head CT scans for acute, atraumatic headaches have the necessary documented indication consistent with clinical guidelines. Members of the Committee acknowledged the measure addresses a critical imaging topic area and were similar in focus to the CMS measure, Use of brain computed tomography in the emergency department for atraumatic headaches (IEP-013-10) submitted to the project. This measure uses different specifications than the CMS measure and is based on American College of Emergency Physicians Clinical Policy. The measure guidelines include both level B and level C recommendation with level C recommendations including “panel consensus” in addition to recommendations based on lower rated studies. While the Committee agreed that the availability of high-level evidence to support the efficient use of CT imaging in adults with acute atraumatic headache is lacking, they had concerns recommending a measure for endorsement based on the measures current level of evidence. The Committee did not recommend the measure for endorsement.

IEP-011-10 Use of stress echocardiography, SPECT MPI, and cardiac stress MRI post CABG (Centers for Medicare and Medicaid Services)*This measure identifies the post-CABG patients being treated with an outpatient service in an outpatient hospital facility, who also had an imaging procedure done at a hospital outpatient facility (i.e., post-CABG patients receiving imaging procedures without exclusion /post-CABG patients seen at the hospital outpatient facility).*

This population, clinician, program andfacility/agencylevel measure aims to evaluate the rate of post-CABG patients being treated with an outpatient service in an outpatient hospital facility, who also had an imaging procedure done at a hospital outpatient facility (i.e., post-CABG patients receiving imaging procedures without exclusion /post-CABG patients seen at the hospital outpatient facility). The Committee expressed significant concerns with the measure as submitted to NQF. The Committee's primary concerns were related to the measure's numerator exclusions, potential unintended consequences for small facilities, and narrow scope.

The Steering Committee laid out three specific conditions the developer needs to address for endorsement recommendation: removal of a six-month blackout period, expansion of the measure sample size, and the broadeningof the measure scope.First, the Committeerequested the removal of the specified six-month exclusion criteria or blackout period where by, "patients with catheterization, percutaneous coronary intervention (PCI) or CABG procedures in six months following the imaging study" are removed from the numerator of the measure. The Committee determined that there are no guidelines for the six-month exclusion criteria and it does not add value. The measure developer responded that the ACC's guidelines do not specify a blackout timeframe. Members from the CMS and Lewin Outpatient Imaging Efficiency Technical Expert Panel empirically examined different timeframes for a blackout period and concluded that three months was too short, and decided upon a six month blackout window.

In addition, the Committee requested the measure developer expand the measure sample size. While the measure developer acknowledged the Committee's concern and agrees that adjustment to increase sample size likely may be needed, they were unable to make the necessary changesdue to time constraints within the Imaging Efficiency project.

The Committee requested the measure developer consider expanding the scope of the measure to include PCI and other settings of care.CMS was agreeable to expanding the scope of the measure to include free standing cardiac centers.Furthermore, the measure developers agreed to expand the measure to PCI, but would measure and report CABG and PCI separately.

While the measure developer agreed to and met several of the Committee conditions for recommendation, the Steering Committee'sfinal determination was to not recommend the

measure for NQF endorsement. The decision was based on the Committee's reservations pertaining to the measure's numerator exclusion criteria. The Committee encouraged the measure developer to reconsider the conditions for recommendation proposed by the Steering Committee and submit a revised measure to NQF at a later date.

IEP-013-10 Use of brain computed tomography (CT) inthe Emergency Department (ED) foratraumatic headache (Centers for Medicare and Medicaid Services)*This measure calculates the percentage of Emergency Department visits for headache with a coincident brain computed tomography (CT) study for Medicare beneficiaries..*

This facility/agency, clinician, population or program level measure assesses the rate of ED visits for a headache with a concurrent brain CT study for Medicare beneficiaries. Evidence suggests headaches account for approximately 16 million physician visits in the U.S. annually.[25] Between 1992 and 2001, headaches represented approximately two percent of all ED visits.[26] With the rate of CT studies in the ED increasing, there are major concerns regarding potential undue harm toward patients, lower quality of care, and system inefficiencies.[27, 28]

The Steering Committee determined that this measure may be appropriate for a younger population because it targets a high overuse area within that population and has the potential for great quality improvement; the Committee also acknowledged its importance in the Medicare population. The Committee noted that the measure was highly feasible because it relies on administrative data. In order to improve the implementation and public reporting of the measure, the Committee requested the measure developer specify in more detail the implementation instructions. The measure developer clarified the measure's implementation instructions and specifications and provided parameters to calculate the measure denominator exclusion codes and numerator specifications.

Prior to member and public comment, the Steering Committee voted to recommend measure IEP-013-10. However, in response to public and member comments regarding this measure the Steering Committee elected to reconsider the measure. The Committee reassessed the measure submission form, reviewed past deliberations and documentation provided by the developer. Overall, public and member comments reflected lack of support for the measure. Comments

focused on the potential for unintended consequences with the use of the measure. For example, there were concerns that older patients with headache could have other clinical reasons for imaging, such as use of oral anticoagulants that would not be captured in this claims-based measure. The Committee decided to revote on the measure across all the evaluation criteria. The final vote resulted in8 members recommending the measure for endorsement and 12members not recommending the measure for endorsement. Based on the Committee's revote, measure IEP-013-10 was not recommended for endorsement.

IEP-017-10 Adequacy of data to assess appropriate use of cardiac stress imaging (American College of Cardiology) *Proportion of test requisitions and/or patient charts documenting use of stress SPECT MPI and stress echo with adequate data to demonstrate avoidance of common inappropriate uses.*

This facility/agency-level measure aims to evaluate the adequacy of data used to justify the ordering of cardiac stress imaging with the goal of reducing inappropriate stress imaging. Given the rate of cost growth in the cardiac imaging field the Committee noted this measure works to address a key area in the outpatient imaging realm important for both payers and consumers.

Despite the need for measures that reduce waste and cost growth in the cardiac imaging field, the Steering Committee determined that this measure did not sufficiently meet NQF's measure importance criteria.Specifically, the submitted measure's specified numerator and denominator are identical,limiting or eliminating the meaningfulness of the measure.Furthermore, the measure is not a measure of *efficiency*; rather it is a measure that indicates if a patient's chart has the data indicating why a test was performed. The Committee noted further problems pertaining to the measure's data specifications and potential legal requirements. Given the Steering Committee's concerns with the measure, the Committee elected to not recommend the measure for NQF endorsement.

IEP-012-10 Simultaneous use of brain computed tomography (CT) and sinus computed tomography (Centers for Medicaid and Medicare)*This measure calculates the percentage of brain CT studies with a simultaneous sinus CT (i.e., brain and sinus CT studies performed on the same day at the same facility). Results of this measure are to be segmented and reported at the facility level.*

This facility/agency, population, clinician and programlevel measure assesses the rate of patients

who received both a brain CT study and, simultaneously, a sinus CT study (i.e., brain and sinus CT studies performed on the same day at the same facility). The intent of the measure is to lower the number of potentially unnecessary sinus CTs performed for patients evaluated for a headache who have already had a brain CT. The Steering Committee determined the measure addressed an important opportunity to change the clinical behavior with respect to ordering practices while lessening the potential undue harm to patients from radiation exposure.

The Steering Committee had concerns that a substantial number of facilities would not be able to report the measure because they would have sample sizes that were too small, thus limiting the number of facilities from across the nation that could report the measure. Further, the Committee determined that the measure does not meet the NQF importance criteria because it does not target an imaging practice with a substantial or large magnitude of overutilization. The measure developer stated that approximately five percent of patients who received a brain CT also received a sinus CT on the same day, thus reaffirming the Committee's view that this imaging practice does not have substantial overuse to support measurement endorsement. Given the Steering Committee's concerns with the measure the Committee did not recommend the measure for endorsement.

Appeals

The American Board of Emergency Medicine (ABEM) submitted a letter of appeal during the project's 30-day appeals period from April 19-May 18, 2011, regarding measures listed in the draft report. The appeal letter concerned two (out of six) measures endorsed: IEP-005-10: Pulmonary CT Imaging for Patients at Low Risk for Pulmonary Embolism (Partners Health System, Inc.) and IEP-007-10: Appropriate head CT imaging in adults with mild traumatic brain injury (Partners Health System, Inc.). The concerns focused on the issue of decreased patient safety, as believed that these measures could potentially limit obtaining diagnostic studies that identify disease. There were also concerns raised that many facilities would not have the specific computerized physician order entry system, which limits the ability of emergency departments to utilize this measure. The measure developers provided written responses to the concerns and both the developers and appellants attended a conference call with the Steering Committee co-chairs and CSAC.

In accordance with the NQF Consensus Development Process, these measures were re-evaluated by CSAC, which maintained its recommendation for endorsement. Finally, the NQF Board of Directors reviewed the committee and CSAC recommendations, and upheld endorsement of the measures in November 2011.

NOTES

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APPENDIX A: SPECIFICATIONS OF THE NATIONAL VOLUNTARY CONSENSUS STANDARDS FOR IMAGING EFFICIENCY

The following table presents the detailed specifications for the National Quality Forum (NQF)-endorsed® *National Voluntary Consensus Standards for Imaging Efficiency*. All information presented has been derived directly from measure sources/developers without modification or alteration (except when the measure developer agreed to such modification during the NQF Consensus Development Process) and is current as of December19, 2011. All NQF-endorsed voluntary consensus standards are open source, meaning they are fully accessible and disclosed.

	IEP-005-10: Pulmonary CT Imaging for Patients at Low Risk for Pulmonary Embolism (Brigham and
Description	Percent of patients undergoing CT pulmonary angiogram for the evaluation of possible PE who have a documented indication consistent with guideline prior to CT imaging.
Numerator	Number of denominator patients with a documented indication consistent with guidelines prior to CT imaging.
Numerator Details	Number of hemodynamically stable patients who receive CT pulmonary angiograms for suspected pulmonary embolism who have of either†: 1. a low clinical probability* of PE and a negative D-Dimer OR 2. a low clinical probability* of PE and no D-Dimer performed OR 3. No documentation of a pre-test probability †Documentation at the time of test ordering, timed prior to test initiation. *clinical probability can be determined by a structured prediction tool (Wells, Revised Geneva) or implicit judgment Specific test cutoffs will be determined by each ED or institution a priori.

Denominator	Number of patients who have a CT pulmonary angiogram (CTPA) for the evaluation of possible pulmonary embolism.
Denominator Details	Denominator Inclusions: Age =18 CTPA performed
Exclusions	Hemodynamically unstable pulmonary embolism suspected by hypotension and/or shock
Exclusion details	Definition of Systemic Hypotension: systolic blood pressure <90mm Hg or a reduction of at least 40mmHg for at least 15 min (1).
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	This measure does not measure across time intervals as all numerator and denominator elements are available at the index visit.
Type	
Type of Score	Rate/Proportion
Data Source	Electronic Health/Medical Record; Paper medical record/flow-sheet; Electronic Clinical Data
Level	Clinicians: Group; Population: national, regional/networks, states; Facility/Agency; Program: QIO
Setting	Ambulatory Care: Emergency Dept.

	IEP-007-10: Appropriate head CT Imaging in Adults with Mild Traumatic Brain Injury (Brigham and
Description	Percent of adult patients who presented within 24 hours of a non-penetrating head injury with a Glasgow coma score (GCS) >13 and underwent head CT for trauma in the ED who have a documented indication consistent with guidelines (1) prior to imaging.
Numerator	Number of denominator patients who have a documented indication consistent with the ACEP clinical policy for mild traumatic brain injury prior to imaging.
Numerator Details	Indications for Head CT in patients presenting to the ED for mild traumatic brain injury: Patients with loss of consciousness or posttraumatic amnesia AND • Headache OR • Vomiting OR • Age>60 OR • Drug/alcohol intoxication OR • Short-term memory deficits OR • Evidence of trauma above the clavicles OR • Posttraumatic seizure OR • GCS<15 OR • Focal neurological deficit OR • Coagulopathy* Patients without loss of consciousness or posttraumatic amnesia AND • Severe headache OR • Vomiting OR • Age>65 OR • GCS<15 OR

	• Physical signs of a basilar skull fracture OR • Focal neurological deficit OR • Coagulopathy* OR • Dangerous Mechanism** *Patient taking anticoagulation (warfarin, fractionated or unfractionated heparin) or has a documented coagulation disorder **Dangerous mechanism of injury includes: ejection from a motor vehicle, a pedestrian struck, and a fall from a height of more than 3 feet or 5 stairs.
Denominator	Number of adult patients undergoing head CT for trauma who presented within 24 hours of a non-penetrating head injury with a Glasgow Coma Scale (GCS).
Denominator Details	- Head CT performed in emergency department (with or without contrast) - Age =16 years - Non-penetrating head trauma -Emergency department presentation within 24 hours of injury - Glasgow Coma Scale (GCS) 14 or 15 on initial emergency department evaluation
Exclusions	- Age <16 years - GCS <14 on initial ED evaluation - Obvious penetrating skull injury or obvious depressed skull fracture - Patients with multisystem trauma - Returned for reassessment of the same injury - Pregnant
Exclusion details	N/A
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	Numerator and denominator data will be collected concurrently at the index visit only, and will not be measured over subsequent time intervals.
Type	
Type of Score	Rate/proportion
Data Source	Electronic administrative data/claims; Paper medical record/flow-sheet ; Electronic Clinical Data
Level	Clinicians: Group; Population: national, states, regional/network; Facility/Agency
Setting	Ambulatory Care: Emergency Dept.; Other: This measure was developed for use in the ED, but the guideline upon which it is based is not specific for the ED. It would be reasonable to consider the measure for the following additional care settings: Office, Clinic, and Hospital Outpatient.

	IEP-008- Appropriate Cervical Spine Radiography and CT Imaging in Trauma (Brigham and Women's
Description	Percent of adult patients undergoing cervical spine radiography or CT imaging for trauma who have a documented evidence-based indication prior to imaging (Canadian C-Spine Rule or the NEXUS Low-Risk Criteria).
Numerator	Number of denominator patients who have a documented evidence-based indication prior to imaging.
Numerator Details	Number of patients who receive cervical spine imaging who either: 1. Fulfill any of the following NEXUS Low-Risk Criteria* for cervical spine injury: - posterior mid-line cervical spine tenderness

	- painful distracting injury - neurological deficits - reduced level of consciousness or intoxication OR 2. Fulfill the Canadian Cervical Spine Rule Criteria* for cervical spine radiography by having a. Any of the following high risk factors that mandates radiography - Dangerous Mechanism** - Paresthesias in the extremities or (b&c) b. None of the following low-risk factors that allows safe assessment of range of motion. (If there is not a low-risk factor which permits safe assessment of the range of motion then radiography should be performed). i. Simple rear-end collision (excluding rollover, collision with bus, large truck, vehicle traveling at high speeds or being pushed into oncoming traffic), or ii. Patient found sitting in the Emergency Department, or iii. Ambulatory after the incident, or iv. Delayed onset of neck pain, or v. Absence of any midline cervical spine tenderness. and c. inability to adequately "range of motion" their neck. - Is the patient able to actively rotate the neck 45 degrees to the left and right? (If the patient is unable, radiography should be performed; otherwise radiography should not be performed). *The clinical decision rules were developed for plain radiography, but are appropriate for similarly selected patients in whom CT scanning is the initial imaging modality **Dangerous mechanisms include a fall from an elevation of 3 feet or 5 stairs, an axial load to the head (e.g., diving); a motor vehicle collision at high speed (>100 kph or 60 mph), or with rollover or ejection; a collision involving a motorized recreational vehicle, or a bike collision.
Denominator	Number of adult patients undergoing cervical spine radiography or CT for trauma (as initial imaging of C-spine)
Denominator Details	Age 16 - 65 years of age Underwent cervical spine imaging as initial full imaging test of the cervical spine Traumatic indication for imaging
Exclusions	<16 years of age or >65 years of age Patients with a reduced ability to communicate (verbal or cognitive dysfunction) Underwent prior cervical spine radiograph (3 view or more) that is interpreted as inadequate to fully assess fracture Underwent prior imaging concerning or diagnostic for injury of the cervical spine requiring further imaging
Exclusion details	N/A
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	Numerator and denominator data will be collected concurrently at the index visit only, and will not be measured over subsequent time intervals.
Type	
Type of Score	Rate/proportion

Data Source	Electronic administrative data/claims; Electronic Clinical Data; Paper medical record/flow-sheet
Level	Facility/Agency; Clinicians: Group; Population: Regional/network, states, national
Setting	Ambulatory Care: Emergency Department; Other: This measure was developed for use in the ED, but the guideline upon which it is based is not specific for the ED. It would be reasonable to consider the measure for the following additional care settings: Office, Clinic, and Hospital Outpatient

	IEP-010-10: Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery
Description	This measure calculates the percentage of low-risk, non-cardiac surgeries performed at a hospital outpatient facility with a Stress Echocardiography, SPECT MPI or Stress MRI study performed in the 30 days prior to the surgery at a hospital outpatient facility (e.g., endoscopic, superficial, cataract surgery, and breast biopsy procedures). Results are to be segmented and reported by hospital outpatient facility where the imaging procedure was performed.
Numerator	Number of Stress Echocardiography, SPECT MPI and Stress MRI studies performed at the hospital outpatient facility in the 30 days preceding low-risk non-cardiac surgery**.**
Numerator Details	SPECT MPI Codes: 78464 – MPI, SPECT, Single, At Rest or Stress 78465 – MPI, SPECT, Multiple, At Rest and/or Stress [Note for 2010 there are new SPECT MPI codes replacing 78464 and 78465. The new codes are 78451 and 78452.] Stress Echocardiography Codes: 93350, C8928 - Echocardiography, trans-thoracic, real time with image documentation, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress with interpretation and report 93351 (New for 2009) – including performance of continuous electrocardiographic monitoring with physician supervision Stress MRI Codes: 75559 – MRI with stress/imaging 75560 – MRI with flow/velocity/stress 75563 – MRI with stress imaging and dye 75564 – MRI with flow/velocity/stress and dye These codes must be found in the 30-day window preceding a low-risk, non-cardiac surgery as defined in the "Denominator Details."
Denominator	Number of low-risk, non-cardiac surgeries performed at the hospital outpatient facility.
Denominator Details	The categories for low-risk surgery are based on the American College of Cardiology (ACC) Appropriateness Criteria for SPECT MPI, including endoscopic procedures, superficial procedure, cataract surgery, and breast biopsy. The list of procedures has been harmonized with the ACC proposed measure for low-risk surgery. Surgery/Integumentary System: Breast 19100 Biopsy of breast 19101 Biopsy of breast 19102 Bx breast percut w/image 19103 Bx breast percut w/device Surgery/Respiratory System: Accessory Sinuses

	31231 Nasal endoscopy, dx 31233 Nasal/sinus endoscopy, dx 31235 Nasal/sinus endoscopy, dx 31237 Nasal/sinus endoscopy, surg 31238 Nasal/sinus endoscopy, surg 31239 Nasal/sinus endoscopy, surg 31240 Nasal/sinus endoscopy, surg 31267 Endoscopy, maxillary sinus 31276 Sinus surgical endoscopy 31299 Sinus surgery procedure Surgery/Respiratory System: Larynx 31505 Diagnostic laryngoscopy 31510 Laryngoscopy with biopsy 31511 Remove foreign body, larynx 31513 Injection into vocal cord 31515 Laryngoscopy for aspiration 31520 Diagnostic laryngoscopy 31525 Diagnostic laryngoscopy 31526 Diagnostic laryngoscopy 31527 Laryngoscopy for treatment 31528 Laryngoscopy and dilatation 31529 Laryngoscopy and dilatation 31530 Operative laryngoscopy 31531 Operative laryngoscopy 31535 Operative laryngoscopy 31536 Operative laryngoscopy 31540 Operative laryngoscopy 31541 Operative laryngoscopy 31560 Operative laryngoscopy 31561 Operative laryngoscopy 31570 Laryngoscopy with injection 31571 Laryngoscopy with injection 31575 Diagnostic laryngoscopy 31576 Laryngoscopy with biopsy 31577 Remove foreign body, larynx 31578 Removal of larynx lesion 31579 Diagnostic laryngoscopy Surgery/Respiratory System: Trachea and Bronchi 31615 Visualization of windpipe 31620 Endobronchial us add-on 31622 Diagnostic bronchoscopy 31623 Dx bronchoscope/brush 31624 Dx bronchoscope/lavage 31625 Bronchoscopy with biopsy 31628 Bronchoscopy with biopsy 31629 Bronchoscopy with biopsy 31632 Bronchoscopy/lung bx, add'l

	31633 Bronchoscopy/needle bxadd'l 31645 Bronchoscopy, clear airways 31646 Bronchoscopy,reclear airways Surgery/Respiratory System: Lungs and Pleura 33508 Endoscopic vein harvest 37500 Endoscopy ligate perf veins 37501 Vascular endoscopy procedure 39400 Visualization of chest Surgery/Digestive System: Esophagus 43200 Esophagus endoscopy 43201 Esoph scope w/submucousinj 43202 Esophagus endoscopy, biopsy 43204 Esophagus endoscopy & inject 43205 Esophagus endoscopy/ligation 43215 Esophagus endoscopy 43216 Esophagus endoscopy/lesion 43217 Esophagus endoscopy 43219 Esophagus endoscopy 43220 Esophagus endoscopy,dilation 43226 Esophagus endoscopy,dilation 43227 Esophagus endoscopy, repair 43228 Esophagus endoscopy,ablation 43231 Esoph endoscopy w/us exam 43232 Esoph endoscopy w/us fnbx 43234 Upper GI endoscopy, exam 43235 Upper GI endoscopy,diagnosis 43236 Upper GI scope w/submucinj 43237 Endoscopic us exam, esoph 43238 Upper GI endoscopy w/us fnbx 43239 Upper GI endoscopy, biopsy 43241 Upper GI endoscopy with tube 43242 Upper GI endoscopy w/us fnbx 43243 Upper GI endoscopy & inject. 43244 Upper GI endoscopy/ligation 43246 Place gastrostomy tube 43247 Operative upper GI endoscopy 43248 Upper GI endoscopy/guidewire 43249 Esophagus endoscopy,dilation 43260 Endoscopy, bile duct/pancreas 43261 Endoscopy, bile duct/pancreas 43262 Endoscopy, bile duct/pancreas 43263 Endoscopy, bile duct/pancreas 43264 Endoscopy, bile duct/pancreas 43265 Endoscopy, bile duct/pancreas 43267 Endoscopy, bile duct/pancreas 43268 Endoscopy, bile duct/pancreas 43269 Endoscopy, bile duct/pancreas

	43271 Endoscopy, bile duct/pancreas
	43272 Endoscopy, bile duct/pancreas
	Surgery/Digestive System: Intestines (Except Rectum)
	44360 Small bowel endoscopy
	44361 Small bowel endoscopy, biopsy
	44363 Small bowel endoscopy
	44383 Ileoscopy w/stent
	44385 Endoscopy of bowel pouch
	44386 Endoscopy, bowel pouch, biopsy
	44388 Colon endoscopy
	44389 Colonoscopy with biopsy
	44390 Colonoscopy for foreign body
	44391 Colonoscopy for bleeding
	44392 Colonoscopy &polypectomy
	44393 Colonoscopy, lesion removal
	44397 Colonoscopy w stent
	Surgery/Digestive System: Rectum
	45300 Proctosigmoidoscopy
	45303 Proctosigmoidoscopy
	45305 Proctosigmoidoscopy; biopsy
	45307 Proctosigmoidoscopy
	45308 Proctosigmoidoscopy
	45309 Proctosigmoidoscopy
	45315 Proctosigmoidoscopy
	45317 Proctosigmoidoscopy
	45320 Proctosigmoidoscopy
	45321 Proctosigmoidoscopy
	45327 Proctosigmoidoscopy w/stent
	45330 Sigmoidoscopy, diagnostic
	45331 Sigmoidoscopy and biopsy
	45332 Sigmoidoscopy
	45333 Sigmoidoscopy&polypectomy
	45334 Sigmoidoscopy for bleeding
	45335 Sigmoidoscope w/submucinj
	45337 Sigmoidoscopy, decompression
	45338 Sigmoidoscopy
	45339 Sigmoidoscopy
	45340 Sig w/balloon dilation
	45341 Sigmoidoscopy w/ultrasound
	45342 Sigmoidoscopy w/us guide bx
	45345 Sigmoidoscopy w/stent
	45378 Diagnostic colonoscopy
	45379 Colonoscopy
	45380 Colonoscopy and biopsy
	45381 Colonoscope, submucousinj
	45382 Colonoscopy,control bleeding
	45383 Colonoscopy, lesion removal

	45384 Colonoscopy 45385 Colonoscopy, lesion removal 45387 Colonoscopy w/stent 45391 Colonoscopy w/endoscope us 45392 Colonoscopy w/endoscopic fnb Surgery/Digestive System: Anus 46600 Diagnostic anoscopy 46604 Anoscopy and dilation 46606 Anoscopy and biopsy 46608 Anoscopy; remove foreign body 46610 Anoscopy; remove lesion 46612 Anoscopy; remove lesions 46614 Anoscopy; control bleeding Surgery/Digestive System: Biliary Tract 47561 Laparo w/cholangio/biopsy Surgery/Digestive System: Abdomen, Peritoneum and Omentum 49322 Laparoscopy, aspiration Surgery/Urinary System: Kidney 50551 Kidney endoscopy 50553 Kidney endoscopy 50555 Kidney endoscopy & biopsy 50557 Kidney endoscopy & treatment 50559 Renal endoscopy; radiotracer 50561 Kidney endoscopy & treatment Surgery/Urinary System: Ureter 50951 Endoscopy of ureter 50953 Endoscopy of ureter 50955 Ureter endoscopy & biopsy 50970 Ureter endoscopy 50972 Ureter endoscopy & catheter 50974 Ureter endoscopy & biopsy 50976 Ureter endoscopy & treatment 50978 Ureter endoscopy & tracer 50980 Ureter endoscopy & treatment Surgery/Urinary System: Bladder 51715 Endoscopic injection/implant 52000 Cystoscopy 52001 Cystoscopy, removal of clots 52005 Cystoscopy & ureter catheter 52007 Cystoscopy and biopsy 52010 Cystoscopy & duct catheter 52204 Cystoscopy 52282 Cystoscopy, implant stent 52327 Cystoscopy, inject material 52330 Cystoscopy and treatment 52351 Cystouretro& or pyeloscope 52352 Cystouretro w/stone remove

	52353 Cystouretero w/lithotripsy 52354 Cystouretero w/biopsy 52355 Cystouretero w/excise tumor 52402 Cystourethro cut ejacul duct Surgery/Female Genital System: Cervix Uteri 57452 Examination of vagina 57454 Vagina examination & biopsy 57455 Biopsy of cervix w/scope 57456 Endocerv curettage w/scope 57460 Cervix excision 57461 Conz of cervix w/scope, leep Surgery/Female Genital System: Corpus Uteri 58555 Hysteroscopy, dx, sepproc 58558 Hysteroscopy, biopsy 58559 Hysteroscopy, lysis 58560 Hysteroscopy, resect septum 58562 Hysteroscopy, remove fb 58565 Hysteroscopy, sterilization Surgery/Female Genital System: Oviduct/Ovary 58670 Laparoscopy, tubal cautery 58671 Laparoscopy, tubal block Surgery/Eye and Ocular Adnexa: Anterior Segment 66820 Incision, secondary cataract 66821 After cataract laser surgery 66830 Removal of lens lesion 66982 Cataract surgery, complex 66983 Remove cataract, insert lens
Exclusions	N/A
Exclusion details	N/A
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	The 30 days preceding a low-risk, non-cardiac surgery.
Type	
Type of Score	Ratio
Data Source	Electronic administrative data/claims
Level	Clinicians: Other; Population: national; Program: Other; Facility/Agency; Other: “Hospital Outpatient Department Outpatient Imaging Efficiency (OIE)”
Setting	Ambulatory Care: Hospital Outpatient

	IEP-014-10 Cardiac stress imaging not meeting appropriate use criteria: Preoperative evaluation in low

Description	Percentage of stress SPECT MPI, stress echo, CCTA, or CMR performed in low risk surgery patients for preoperative evaluation
Numerator	Number of stress SPECT MPI, stress echo, CCTA, or CMR performed in low risk surgery patients as a part of the preoperative evaluation
Numerator Details	SPECT MPI Codes: 78464 – MPI, SPECT, Single, At Rest or Stress 78465 – MPI, SPECT, Multiple, At Rest and/or Stress [Note for 2010 there are new SPECT MPI codes replacing 78464 and 78465. The new codes are 78451 and 78452.] Stress Echocardiography Codes: 93350, C8928 - Echocardiography, trans-thoracic, real time with image documentation, during rest and cardiovascular stress test using treadmill, bicycle exercise and/or pharmacologically induced stress with interpretation and report 93351 (New for 2009) – including performance of continuous electrocardiographic monitoring with physician supervision Stress MRI Codes: 75559 – MRI with stress/imaging 75560 – MRI with flow/velocity/stress 75563 – MRI with stress imaging and dye 75564 – MRI with flow/velocity/stress and dye These codes must be found in the 30-day window preceding a low-risk, non-cardiac surgery as defined in the "Denominator Details."
Denominator	Number of stress SPECT MPI, stress echo, CCTA, and CMR performed
Denominator Details	The categories for low-risk surgery are based on the American College of Cardiology (ACC) Appropriateness Criteria for SPECT MPI, including endoscopic procedures, superficial procedure, cataract surgery, and breast biopsy. The list of procedures has been harmonized with the ACC proposed measure for low-risk surgery. Surgery/Integumentary System: Breast 19100 Biopsy of breast 19101 Biopsy of breast 19102 Bx breast percut w/image 19103 Bx breast percut w/device Surgery/Respiratory System: Accessory Sinuses 31231 Nasal endoscopy, dx 31233 Nasal/sinus endoscopy, dx 31235 Nasal/sinus endoscopy, dx 31237 Nasal/sinus endoscopy, surg 31238 Nasal/sinus endoscopy, surg 31239 Nasal/sinus endoscopy, surg 31240 Nasal/sinus endoscopy, surg 31267 Endoscopy, maxillary sinus 31276 Sinus surgical endoscopy 31299 Sinus surgery procedure Surgery/Respiratory System: Larynx 31505 Diagnostic laryngoscopy 31510 Laryngoscopy with biopsy 31511 Remove foreign body, larynx

	31513 Injection into vocal cord 31515 Laryngoscopy for aspiration 31520 Diagnostic laryngoscopy 31525 Diagnostic laryngoscopy 31526 Diagnostic laryngoscopy 31527 Laryngoscopy for treatment 31528 Laryngoscopy and dilatation 31529 Laryngoscopy and dilatation 31530 Operative laryngoscopy 31531 Operative laryngoscopy 31535 Operative laryngoscopy 31536 Operative laryngoscopy 31540 Operative laryngoscopy 31541 Operative laryngoscopy 31560 Operative laryngoscopy 31561 Operative laryngoscopy 31570 Laryngoscopy with injection 31571 Laryngoscopy with injection 31575 Diagnostic laryngoscopy 31576 Laryngoscopy with biopsy 31577 Remove foreign body, larynx 31578 Removal of larynx lesion 31579 Diagnostic laryngoscopy Surgery/Respiratory System: Trachea and Bronchi 31615 Visualization of windpipe 31620 Endobronchial us add-on 31622 Diagnostic bronchoscopy 31623 Dx bronchoscope/brush 31624 Dx bronchoscope/lavage 31625 Bronchoscopy with biopsy 31628 Bronchoscopy with biopsy 31629 Bronchoscopy with biopsy 31632 Bronchoscopy/lung bx, add'l 31633 Bronchoscopy/needle bxadd'l 31645 Bronchoscopy, clear airways 31646 Bronchoscopy,reclear airways Surgery/Respiratory System: Lungs and Pleura 33508 Endoscopic vein harvest 37500 Endoscopy ligate perf veins 37501 Vascular endoscopy procedure 39400 Visualization of chest Surgery/Digestive System: Esophagus 43200 Esophagus endoscopy 43201 Esoph scope w/submucousinj 43202 Esophagus endoscopy, biopsy 43204 Esophagus endoscopy & inject 43205 Esophagus endoscopy/ligation

	43215 Esophagus endoscopy 43216 Esophagus endoscopy/lesion 43217 Esophagus endoscopy 43219 Esophagus endoscopy 43220 Esophagus endoscopy,dilation 43226 Esophagus endoscopy,dilation 43227 Esophagus endoscopy, repair 43228 Esophagus endoscopy,ablation 43231 Esoph endoscopy w/us exam 43232 Esoph endoscopy w/us fnbx 43234 Upper GI endoscopy, exam 43235 Upper GI endoscopy,diagnosis 43236 Upper GI scope w/submucinj 43237 Endoscopic us exam, esoph 43238 Upper GI endoscopy w/us fnbx 43239 Upper GI endoscopy, biopsy 43241 Upper GI endoscopy with tube 43242 Upper GI endoscopy w/us fnbx 43243 Upper GI endoscopy & inject. 43244 Upper GI endoscopy/ligation 43246 Place gastrostomy tube 43247 Operative upper GI endoscopy 43248 Upper GI endoscopy/guidewire 43249 Esophagus endoscopy,dilation 43260 Endoscopy, bile duct/pancreas 43261 Endoscopy, bile duct/pancreas 43262 Endoscopy, bile duct/pancreas 43263 Endoscopy, bile duct/pancreas 43264 Endoscopy, bile duct/pancreas 43265 Endoscopy, bile duct/pancreas 43267 Endoscopy, bile duct/pancreas 43268 Endoscopy, bile duct/pancreas 43269 Endoscopy, bile duct/pancreas 43271 Endoscopy, bile duct/pancreas 43272 Endoscopy, bile duct/pancreas Surgery/Digestive System: Intestines (Except Rectum) 44360 Small bowel endoscopy 44361 Small bowel endoscopy, biopsy 44363 Small bowel endoscopy 44383 Ileoscopy w/stent 44385 Endoscopy of bowel pouch 44386 Endoscopy, bowel pouch, biopsy 44388 Colon endoscopy 44389 Colonoscopy with biopsy 44390 Colonoscopy for foreign body 44391 Colonoscopy for bleeding 44392 Colonoscopy &polypectomy

	44393 Colonoscopy, lesion removal 44397 Colonoscopy w stent Surgery/Digestive System: Rectum 45300 Proctosigmoidoscopy 45303 Proctosigmoidoscopy 45305 Proctosigmoidoscopy; biopsy 45307 Proctosigmoidoscopy 45308 Proctosigmoidoscopy 45309 Proctosigmoidoscopy 45315 Proctosigmoidoscopy 45317 Proctosigmoidoscopy 45320 Proctosigmoidoscopy 45321 Proctosigmoidoscopy 45327 Proctosigmoidoscopy w/stent 45330 Sigmoidoscopy, diagnostic 45331 Sigmoidoscopy and biopsy 45332 Sigmoidoscopy 45333 Sigmoidoscopy&polypectomy 45334 Sigmoidoscopy for bleeding 45335 Sigmoidoscope w/submucinj 45337 Sigmoidoscopy, decompression 45338 Sigmoidoscopy 45339 Sigmoidoscopy 45340 Sig w/balloon dilation 45341 Sigmoidoscopy w/ultrasound 45342 Sigmoidoscopy w/us guide bx 45345 Sigmoidoscopy w/stent 45378 Diagnostic colonoscopy 45379 Colonoscopy 45380 Colonoscopy and biopsy 45381 Colonoscope, submucousinj 45382 Colonoscopy,control bleeding 45383 Colonoscopy, lesion removal 45384 Colonoscopy 45385 Colonoscopy, lesion removal 45387 Colonoscopy w/stent 45391 Colonoscopy w/endoscope us 45392 Colonoscopy w/endoscopic fnb Surgery/Digestive System: Anus 46600 Diagnostic anoscopy 46604 Anoscopy and dilation 46606 Anoscopy and biopsy 46608 Anoscopy; remove foreign body 46610 Anoscopy; remove lesion 46612 Anoscopy; remove lesions 46614 Anoscopy; control bleeding Surgery/Digestive System: Biliary Tract

	47561 Laparo w/cholangio/biopsy
	Surgery/Digestive System: Abdomen, Peritoneum and Omentum
	49322 Laparoscopy, aspiration
	Surgery/Urinary System: Kidney
	50551 Kidney endoscopy
	50553 Kidney endoscopy
	50555 Kidney endoscopy & biopsy
	50557 Kidney endoscopy & treatment
	50559 Renal endoscopy; radiotracer
	50561 Kidney endoscopy & treatment
	Surgery/Urinary System: Ureter
	50951 Endoscopy of ureter
	50953 Endoscopy of ureter
	50955 Ureter endoscopy & biopsy
	50970 Ureter endoscopy
	50972 Ureter endoscopy & catheter
	50974 Ureter endoscopy & biopsy
	50976 Ureter endoscopy & treatment
	50978 Ureter endoscopy & tracer
	50980 Ureter endoscopy & treatment
	Surgery/Urinary System: Bladder
	51715 Endoscopic injection/implant
	52000 Cystoscopy
	52001 Cystoscopy, removal of clots
	52005 Cystoscopy & ureter catheter
	52007 Cystoscopy and biopsy
	52010 Cystoscopy & duct catheter
	52204 Cystoscopy
	52282 Cystoscopy, implant stent
	52327 Cystoscopy, inject material
	52330 Cystoscopy and treatment
	52351 Cystouretro& or pyeloscope
	52352 Cystouretro w/stone remove
	52353 Cystouretero w/lithotripsy
	52354 Cystouretero w/biopsy
	52355 Cystouretero w/excise tumor
	52402 Cystourethro cut ejacul duct
	Surgery/Female Genital System: Cervix Uteri
	57452 Examination of vagina
	57454 Vagina examination & biopsy
	57455 Biopsy of cervix w/scope
	57456 Endocerv curettage w/scope
	57460 Cervix excision
	57461 Conz of cervix w/scope, leep
	Surgery/Female Genital System: Corpus Uteri
	58555 Hysteroscopy, dx, sepproc
	58558 Hysteroscopy, biopsy

	58559 Hysteroscopy, lysis 58560 Hysteroscopy, resect septum 58562 Hysteroscopy, remove fb 58565 Hysteroscopy, sterilization Surgery/Female Genital System: Oviduct/Ovary 58670 Laparoscopy, tubal cautery 58671 Laparoscopy, tubal block Surgery/Eye and Ocular Adnexa: Anterior Segment 66820 Incision, secondary cataract 66821 After cataract laser surgery 66830 Removal of lens lesion 66982 Cataract surgery, complex 66983 Remove cataract, insert lens
Exclusions	N/A
Exclusion details	N/A
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	The 30 days preceding a low-risk, non-cardiac surgery.
Type	
Type of Score	Ratio
Data Source	Paper medical record/flow sheet; Survey: Provider
Level	Facility/Agency
Setting	Ambulatory Care: Hospital Outpatient

	IEP- 015-10 Cardiac stress imaging not meeting appropriate use criteria: Routine testing after
Description	Percentage of all stress SPECT MPI and stress echo performed routinely after PCI, with reference to timing of test after PCI and symptom status.
Numerator	Number of stress SPECT MPI, stress echo, CCTA and CMR performed in asymptomatic patients within 2 years of the most recent PCI
Numerator Details	For all orders post PCI, determine all orders that were in asymptomatic patients: Among asymptomatic patients, subtract date of most recent PCI from date of test requisition and categorize into orders less than two years since most recent PCI and orders placed greater than or equal to two years since most recent PCI Patients qualify for this measure if: - Asymptomatic AND - Less than two years since most recent PCI NOTE: Data collection from patient requisition is required to adequately determine patient's symptom status. Determination with only administrative data is not possible for these measures.
Denominator	Number of stress SPECT MPI, stress echo, CCTA and CMR performed

Denominator Details	All consecutive stress SPECT MPI, stress echocardiography, CCTA and CMR orders Measurement Entity: Imaging laboratory prospectively measured on test requisition forms and/or patient charts Level of Measurement/Analysis: Imaging laboratory* *Attribution for inappropriate use is shared between the ordering physician and imaging laboratory. In an ideal world, attribution to the ordering physician or institution, as well as the imaging laboratory, would be reflected in the reporting of these measures. However, there are numerous complexities that prevent assignment of these measures to individual ordering physicians. For example, ordering volumes from individual physicians and institutions are insufficient to make meaningful comparisons to allow such attribution. Thus, these measures will be reported at the level of the imaging laboratory. However, the extent to which the institution housing the imaging laboratory can impact these measures will be dependent upon cooperation of ordering physicians with the imaging laboratory.
Exclusions	N/A
Exclusion details	N/A
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	Sample of all SPECT MPI, stress echo, CCTA and CMR test orders during a calendar year using a single, consecutive 60 day time period
Type	
Type of Score	Rate/proportion
Data Source	Paper medical records; Survey: Provider
Level	Facility/Agency
Setting	Ambulatory Care: Office; Ambulatory Care: Hospital Outpatient

	IEP-016-10 Cardiac stress imaging not meeting appropriate use criteria: Testing in asymptomatic, low
Description	Percentage of all stress SPECT MPI, stress echo, CCTA, and CMR performed in asymptomatic, low CHD risk patients for initial detection and risk assessment
Numerator	Number of stress SPECT MPI, stress echo, CCTA, and CMR performed for asymptomatic, low CHD risk patients for initial detection and risk assessment
Numerator Details	For all orders in asymptomatic patients, determine orders for initial diagnosis and risk assessement. In doing so, patients with known CHD, prior PCI or prior CABG and the following exclusions are not included. Patients qualify for this numerator if: - Asymptomatic AND - Low CHD risk based on clinician estimate AND NOT any of the following: - Known CAD, including • prior MI • prior ACS • prior CABG • prior PCI or • CHD on prior diagnostic test

	- Exercise stress treadmill - Non-invasive imaging - Stress echo - Stress SPECT MPI - CT Angiography - Calcium Scoring - Invasive imaging (cardiac catheterization) • Ischemic equivalent • Undergone prior CHD assessment by one the following methods no matter the test result: o Exercise stress treadmill o Non-invasive imaging - Stress echo - Stress SPECT MPI - CT Angiography - Calcium Scoring o Invasive imaging (cardiac catheterization) • Patients for whom preoperative testing is the primary reason for imaging Submission of individual clinical data variables required for Framingham risk (ATP III criteria) calculation for asymptomatic patients is recognized to place a significant data collection burden upon institutions and may not be possible based on data elements that are readily available at the imaging laboratory. As such, a clinician estimate of CHD risk will be collected for all asymptomatic patients who are being seen for initial detection and risk assessment without known coronary heart disease. However, in making their estimate, clinicians should consider the maximum number of available patient factors used to estimate risk based on Framingham (ATP III criteria), typically age, gender, diabetes, smoking status, and use of blood pressure medication, and integrate age appropriate estimates for missing elements, such as LDL or standard blood pressure. While calculation of the estimate does not require submission of the actual clinical data elements other than the clinician estimate of CHD risk, clinicians are attesting to the accuracy of the estimate by submitting it. An audit of clinician estimates should be completed on a subset of clinicians to verify their estimates as being accurate based on the data that was available. NOTE: Data collection from patient requisition is required to adequately determine patient's symptom status and clinical risk. Determination with only administrative data is not possible for this measure.
Denominator	Number of stress SPECT MPI, stress echo, CCTA, and CMR performed
Denominator Details	All consecutive stress SPECT MPI, stress echocardiography, CCTA, and CMR orders Measurement Entity: Imaging laboratory prospectively measured on test requisition forms and/or patient charts Level of Measurement/Analysis: Imaging laboratory* *Attribution for inappropriate use is shared between the ordering physician and imaging laboratory. In an ideal world, attribution to the ordering physician or institution, as well as the imaging laboratory, would be reflected in the reporting of these measures. However, there are numerous complexities that prevent assignment of these measures to individual ordering physicians. For example, ordering volumes from individual physicians and institutions are insufficient to make meaningful comparisons to allow such attribution. Thus, these measures will be reported at the level of the imaging laboratory. However, the extent to which the institution housing the imaging laboratory can impact these measures will be dependent upon cooperation of ordering physicians with the imaging laboratory.
Exclusions	N/A

Exclusion details	N/A
Risk Adjustment	N/A
Stratification	N/A
Numerator Time window	Sample of all SPECT MPI, stress echo, CCTA, and CMR test orders during a calendar year using a single, consecutive 60 day time period
Type	
Type of Score	Rate/proportion
Data Source	Paper medical record/flow-sheet; Survey: Patient
Level	Facility/Agency
Setting	Ambulatory Care: Office; Ambulatory Care: Hospital Outpatient

APPENDIX B: IMAGING EFFICIENCY STEERING COMMITTEE AND NQF STAFF

Dr. G. Scott Gazelle, MD, MPH, PhD (Co-Chair)
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