Surgery, Fall 2017 Cycle: CDP Report

TECHNICAL REPORT

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NATIONAL QUALITY FORUM

Contents

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Executive Summary

Millions of Americans undergo surgical procedures each year, and the rate of surgical procedures is increasing annually, with 51.4 million inpatient procedures performed in 2010.[1] Surgery is a daunting prospect for patients, who are increasingly seeking information from publicly reported quality measures to make decisions about surgical care. The important aspects of quality for patients and families are the likelihood of surgical success—i.e., the surgery achieving its intended outcome—and avoidance of complications. Given the rapid growth in surgery and surgical procedures, an opportunity to identify and endorse meaningful measures that will improve quality continues.

The National Quality Forum (NQF) has endorsed surgical measures through a variety of projects since 2004 with the National Voluntary Consensus Standards for Cardiac Surgery. The measures in NQF's surgery endorsement project focus on key surgical care processes across an array of procedure types that include outcomes for general and subspecialty surgical procedures, including cardiac, orthopedic, ophthalmological, and vascular surgeries and procedures, and all phases of perioperative care. Many of the measures are used in public and/or private sector accountability and quality improvement programs. However, while significant strides have been made in some areas, gaps remain in specific procedure areas like pediatrics, and in specialty areas—in which quality measurement is in its early stages—including orthopedic surgery, bariatric surgery, neurosurgery, obstetrics, and gynecology. Gaps also remain for measures that assess overall surgical quality, shared accountability, and patient focus.

For this project, the Standing Committee evaluated two newly submitted measures and one measure undergoing maintenance review against NQF's standard evaluation criteria. The endorsed measures are:

- 3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (Centers for Medicare & Medicaid Services/Yale CORE)
- 1790 Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer (The Society of Thoracic Surgeons)
- 3294 STS Lobectomy for Lung Cancer Composite Score (The Society of Thoracic Surgeons)

The body of this report briefly summarizes the measures currently under review. Appendix A includes detailed summaries of the Committee's discussion and ratings of the criteria for each measure.

Introduction

Given the increasing rates and costs associated with inpatient and outpatient surgeries in the United States, performance measurement and reporting provides an opportunity to improve the safety and quality of care received by Americans undergoing surgery and surgical procedures. In 2010, 51.4 million inpatient procedures and 53.3 million surgical and nonsurgical procedures were performed in U.S. ambulatory surgery centers (43 percent of all same-day surgery).[1] In 2014, there were 17.2 million hospital visits that included at least one surgery.[2] Of these surgeries, over half occurred in a hospital-owned ambulatory surgical center.[2]

Ambulatory surgeries have increased over time as a result of less invasive surgical techniques, patient conveniences, such as less time spent undergoing a procedure, and lower costs.[3,4] By payer, private insurance accounted for 48.6 percent of ambulatory surgery visits, with Medicare and Medicaid covering 30.8 percent and 14.0 percent of visits, respectively.[2] However, there are risks associated with ambulatory surgeries including increased pain and longer time than anticipated to return to daily activities, and unplanned subsequent hospital visits following surgery.[5,6]

With the continued growth in the outpatient surgery market, monitoring and assessing the quality of the services provided has never held greater importance.

NQF Portfolio of Performance Measures for Surgical Procedures

NQF has endorsed over 100 measures related to surgical care (Appendix B). These measures address subjects such as perioperative safety, cardiac surgery, vascular surgery, colorectal surgery, and a range of other clinical and procedural subtopics. For the purposes of NQF's maintenance of endorsement, the Surgery Standing Committee is responsible for 62 measures: 12 process measures, 40 outcome measures, four structural measures, and six composite measures (see Table 1 below).

Table 1. NQF Surgery Portfolio of Measures

Subtopic	Process	Outcome/Resource Use	Structure	Composite
Abdominal and Colorectal Surgery	1	1	–	–
Anesthesia	–	1	–	–
Cardiac Surgery	5	16	3	6
General Surgery	–	2	–	–
Cross-Cutting (Inpatient & Outpatient Surgery)	–	1	–	–
Cross-Cutting (Inpatient Surgery)	–	1	–	–
Cross-Cutting (Outpatient Surgery)	–	2	–	–
Orthopedic Surgery	–	3	–	–
Ophthalmology	–	5	–	–
Thoracic Surgery	–	1	1	–
Urogynecology/Gynecology	4	–	–	–
Vascular Surgery	2	7	–	–
Total	12	40	4	6

The remaining measures have been assigned to other portfolios. These include healthcare-associated infection measures (Patient Safety), care coordination measures (Geriatrics and Palliative Care), imaging efficiency measures (Cost and Resource Use), and a variety of condition- or procedure-specific outcome measures (Cardiovascular, Cancer, Renal, etc.).

Surgery Measure Evaluation

Four measures were submitted for endorsement consideration: three new measures and one measure undergoing maintenance review. One new measure reviewed by the NQF Scientific Methods Panel received a low rating on the reliability criterion. According to the NQF Methods Panel process, if panel members rate either reliability or validity as low or insufficient, then the measure is not sent to the standing committee for review, and is dropped from the current evaluation cycle, but can be resubmitted in a subsequent cycle. The Panel provided comments and concerns to the developer to inform updates to its measure submission for a future cycle. On February 1 and February 6, the Surgery Standing Committee evaluated two new measures and one measure undergoing maintenance review against NQF's standard evaluation criteria.

Table 2. Surgery Measure Evaluation Summary

	Maintenance	New	Total
Measures under consideration	1	3	4
Endorsed measures	1	2	3
Measures removed from consideration following NQF Methods Panel review	0	1	1
Reasons for not recommending	Importance – 0 Scientific Acceptability – 0 Use – 0 Overall Suitability – 0 Competing Measure – 0	Importance – 0 Scientific Acceptability – 0 Use – 0 Overall Suitability – 0 Competing Measure – 0	

Comments Received Prior to Committee Evaluation

NQF solicits comments on endorsed measures on an ongoing basis through the Quality Positioning System (QPS). In addition, NQF solicits comments prior to the evaluation of the measures via an online tool located on the project webpage. For this evaluation cycle, the pre-evaluation comment period was open from December 11, 2017 to January 24, 2018 for all of the measures under review. As of January 24, no comments were submitted.

Comments Received After Committee Evaluation

The continuous 16-week public commenting period with NQF member support closed on April 12, 2018. Following the Committee's evaluation of the measures under consideration, NQF received three

comments from three organizations (including two member organizations) and individuals pertaining to the draft report and to the measures under consideration. All three comments expressed concern about the endorsement of NQF #3357 and have been summarized in Appendix A.

Throughout the 16-week continuous public commenting period, NQF members had the opportunity to express their support ('support' or 'do not support') for each measure submitted for endorsement consideration to inform the Committee's recommendations. Two NQF members did not support NQF #3357 *Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers*.

Summary of Measure Evaluation

The following brief summaries of the measure evaluation highlight the major issues that the Committee considered. Details of the Committee's discussion and ratings of the criteria for each measure are included in Appendix A.

General Surgery

3357 Facility-Level 7-Day Hospitals Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (Centers for Medicare & Medicaid Services/Yale CORE): Endorsed

Description: Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission; **Measure Type**: Outcome; **Level of Analysis**: Facility; **Setting of Care**: Outpatient services; **Data Source**: Claims, Enrollment Data

This new outcome measure assesses the rate of unplanned hospital visits within seven days of a general surgery procedure at ambulatory surgical centers among Medicare fee-for-service patients age 65 and older. The Committee determined that significant evidence supports this measure. In their discussion on disparities, the Committee questioned whether the measure is impartial to ambulatory surgical centers caring for majority dual eligible populations, since data showed that dual eligible patients were more likely to be readmitted following surgery than African-Americans or patients with low socioeconomic status. The Committee agreed that the measure met the scientific acceptability criterion. In the discussion of usability and use, a Committee member suggested that the opioid use variable be clarified to differentiate opioid use and opioid abuse. Overall, the Committee agreed that the measure met NQF evaluation criteria and recommended the measure for NQF endorsement.

The Committee discussed three submitted comments for this measure during the post-comment call on May 3, 2018. Comments addressed measure specifications, measure validity, lack of sociodemographic risk adjustment, and whether the measure provides meaningful information on performance. The Committee agreed that the developer addressed the comments and upheld its recommendation for endorsement.

Lung Cancer

1790 Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer (The Society of Thoracic Surgeons): Endorsed

Description: Percentage of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location); **Measure Type**: Outcome ; **Level of Analysis**: Facility; **Setting of Care**: Inpatient/Hospital; **Data Source**: Other, Registry Data

This maintenance measure was initially endorsed in 2012. It assesses the percentage of patients undergoing elective lung resection for lung cancer who developed postoperative complications. The Committee agreed that this measure continues to meet NQF evaluation criteria, noting that a change in the specifications—from monitoring "bleeding requiring reoperation" to "an unexpected return to the operating room"—was appropriate because it may help to improve outcomes. The Committee stated that the measure met the scientific acceptability and feasibility criteria. In their discussion on use, the Committee questioned why NQF #3294 *STS Lobectomy for Lung Cancer Composite Score* is publicly reported, but this measure is not. The developer explained that NQF #3294 was chosen for public reporting since lobectomy is the most common and homogenous procedure performed. Overall, the Committee agreed that the measure met NQF evaluation criteria and recommended it for continued endorsement.

3294 STS Lobectomy for Lung Cancer Composite Score (The Society of Thoracic Surgeons): Endorsed

Description: The STS Lobectomy Composite Score comprises two domains: 1. Operative Mortality (death during the same hospitalization as surgery or within 30 days of the procedure). 2. Presence of at least one of these major complications: pneumonia, acute respiratory distress syndrome, bronchopleural fistula, pulmonary embolus, initial ventilator support greater than 48 hours, reintubation/respiratory failure, tracheostomy, myocardial infarction, or unexpected return to the operating room. The composite score is created by a weighted combination of the above two domains resulting in a single composite score. In addition to receiving a numeric score, participants are assigned to rating categories designated by the following: 1 star: lower-than expected performance; 2 stars: as-expected-performance; 3 stars: higher-than-expected-performance; **Measure Type**: Composite; **Level of Analysis**: Facility; **Setting of Care**: Inpatient/Hospital; **Data Source**: Other, Registry Data

This new composite measure assesses operative mortality and the presence of at least one of nine major complications related to a lobectomy, the most frequently performed lung resection procedure. The Committee agreed that a composite score from a weighted combination of mortality and operative complications provides a more comprehensive measure of overall surgical quality. Committee members noted the importance of the measure for public reporting and accountability, as demonstrated by improvement in outcomes in the Society of Thoracic Surgeons (STS) General Thoracic Surgery Database (GTSD). As lobectomy is the single most common major procedure that a thoracic surgeon performs

within the broad category of lung cancer resections, Committee members noted that the measure is particularly useful and appropriate to use as a benchmark for performance by general thoracic surgery programs. Providing surgeons with risk-adjusted results can help identify how they are performing on thoracic surgeries compared with other programs in the STS GTSD. Overall, the Committee agreed that the measure met NQF evaluation criteria and recommended it for endorsement.

References

1 Centers for Disease Control and Prevention. NHDS - Selected Tables. National Hospital Discharge Survey. https://www.cdc.gov/nchs/nhds/nhds_tables.htm. Last accessed February 2018.

2 Steiner CA, Karaca Z, Moore BJ, et al. Surgeries in Hospital-Based Ambulatory Surgery and Hospital Inpatient Settings, 2014: Statistical Brief #223. In: *Healthcare Cost and Utilization Project (HCUP) Statistical Briefs*. Rockville, MD: Agency for Healthcare Research and Quality; 2006. http://www.ncbi.nlm.nih.gov/books/NBK442035/. Last accessed February 2018.

3 Munnich EL, Parente ST. Procedures take less time at ambulatory surgery centers, keeping costs down and ability to meet demand up. *Health Aff*. 2014;33(5):764-769.

4 Farrell D, Jensen E, Kochner B, et al. *Accounting for the Cost of US Health Care: A New Look at Why Americans Spend More*. McKinsey Global Institute; 2008. https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/accounting-for-the-cost-of-us-health-care. Last accessed February 2018.

5 Manohar A, Cheung K, Wu CL, et al. Burden incurred by patients and their caregivers after outpatient surgery: a prospective observational study. *Clin Orthop*. 2014;472(5):1416-1426.

6 Fox JP, Vashi AA, Ross JS, et al. Hospital-based, acute care after ambulatory surgery center discharge. *Surgery*. 2014;155(5):743-753.

Appendix A: Details of Measure Evaluation

Rating Scale: H=High; **M**=Moderate; **L**=Low; **I**=Insufficient; **NA**=Not Applicable

Endorsed Measures

3357 Facility Level 7-day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers

Submission | Specifications

Description: Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission

Numerator Statement: The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within 7 days of a general surgery procedure performed at an ASC.

Denominator Statement: Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than

defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

Exclusions: The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.

Adjustment/Stratification: Not Applicable

Level of Analysis: Facility

Setting of Care: Outpatient services

Type of Measure: Outcome

Data Source: Claims, Enrollment Data

Measure Steward: Centers for Medicare & Medicaid Services (CMS)

STANDING COMMITTEE MEETING [02/06/2018]

1. Importance to Measure and Report: **<u>The measure meets the Importance criteria</u>**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Yes-17**; **No-0**; 1b. Performance Gap: **H-9**; **M-8**; **L-0**; **I-0;**

<u>Rationale</u>:

- The evidence base for the measure includes several studies regarding the factors that can predict unplanned readmissions, complications, and mortality following surgery. The Committee

agreed that the evidence base supports that patient selection and preparation, post-operative care, and post-discharge planning can affect the rate of adverse events and unplanned admissions following outpatient surgery.

- Data submitted by the developer suggest variation in patient outcomes associated with ambulatory surgical center surgeries, with performance scores ranging from 0.42 to 2.13. Data also showed that among African Americans (3.1 percent), and patients with low socioeconomic status (2.2 percent) or dual eligible patients (3.7 percent), that dual eligible patients had higher readmission rates. A Committee member questioned whether this measure presents a disadvantage to ambulatory surgical centers that serve a large number of dual eligible patients.
- The developer noted that ambulatory surgical centers that serve a greater number of dual eligible patients are not doing any worse that centers with lower number of dual eligible patients. Another Committee member noted that ambulatory surgical centers' perception of risk in taking on dual eligible patients could drive discriminatory behavior.
- Ultimately, Committee members agreed that the measure met both the evidence and performance gap subcriteria.

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2. Scientific Acceptability of Measure Properties: <u>The measure meets the Scientific Acceptability criteria</u>

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity)

2a. Reliability: **H-3**; **M-15**; **L-0**; **I-0** 2b. Validity: **M-16**; **L-1**; **I-0**

<u>Rationale</u>:

- This measure calculates the ratio of the predicted to the expected number of post-surgical unplanned hospital visits among ambulatory surgical center (ASC) patients.
- The developer tested the reliability of the measure by calculating the intra-class correlation coefficient (ICC) of the measure score with the Medicare fee for service (FFS) calendar year 2012-2015 dataset. Reliability testing yielded an ICC of 0.530.
- The Committee agreed that the ICC score indicates moderate measure score reliability. (Results at the unit level of the ASC were higher.)
- A Committee member asked whether adding in isolated ICD-9 and ICD-10 codes, such as obesity or neurocognitive problems, would be helpful in improving the reliability of the measure.
- The developer explained they used a grouper approach for grouping ICD-9 and ICD-10 codes, which pulls in diagnoses for diseases. The developer stated that for some variables for obesity, instead of using the grouper, the most extreme cases of obesity were identified using codes. An expert panel reviewed a list of candidate variables and agreed on the conceptual risk variables they would like to test. The developer noted that obesity and neurodegenerative codes were initially included in the measure but were not statistically significant. The developer explained that the expert panel was able to iterate on the inclusion of both variables. Ultimately, obesity codes were put back in the measure but neurodegenerative codes were not.
- The developer noted they would continue to collect information regarding clinical risk factors that could be included in the model.
- Ultimately, the Committee agreed the measure met the reliability and validity criterion.

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3. Feasibility: H-14; M-2; L-0; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c.Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The Committee noted that the measure is claim based and there are no registry fees associated with this measure. The Committee agreed the measure is feasible to collect.

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4. Usability and Use:

(Used and useful to the intended audiences for 4a. Accountability and Transparency; 4b. Improvement; and 4c. Benefits outweigh evidence of unintended consequences)

4a. Use**: Pass-17; No Pass-0** 4b. Usability: **H-2; M-3; L-0; I-11**

Rationale:

- The Committee stated that although the measure is not currently in use, the developer provides a path for the use of this measure in the Medicare Ambulatory Surgical Center Quality (ASCQ) reporting program. The Committee also noted that the measure was supported for pre-rulemaking by the Measure Applications Partnership (MAP) in 2017.
- The Committee noted that the developer's technical advisory panel asked that additional procedure specific information be included in the measure and continued inclusion of opioid use as a risk in the model. One Committee member suggested that the developer clarify the variable for opioid use since the ICD-9 and ICD-10 codes definitions specify opioid abuse. The Committee member noted the importance of accurately assessing the causes of readmissions. The developer agreed to clarify the variable for opioid dependency or abuse.
- The Committee agreed that this measure could be an important feedback mechanism for ASCs to identify root causes for readmissions and ultimately improve outcomes.
- The Committee questioned whether the Committee should be looking for demonstrated usability or potential usability of the measure. NQF clarified that the measure was rated insufficient on usability since it was a new measure and no information was provided on the planned use of this measure. The developer will need to provide usability information upon maintenance of endorsement if the measure is recommended for endorsement. There is a stronger emphasis on use and usability for maintenance measures.
- Ultimately, the Committee agreed that the measure met this criterion.

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5. Related and Competing Measures

- This measure is related to #2687 *Hospital Visits after Hospital Outpatient Surgery* and #2539 *Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy*.
- The developer clarified that #2687 and #2539 include exclusions for same day procedure claims (i.e., hospital or emergency department visits that occur the same day) but this measure (#3357) does not. In the rationale for #2687 and #2539, the developer notes that the exclusion is included since with claims it is difficult to tell which came first, the hospital visit after surgery or a patient's visit to the outpatient department.
- The developer noted that the other measures exclude emergency or hospital visits on the same day because in the outpatient setting, the patient can go to the emergency department at the same hospital and then have their procedure or vice versa. The developer stated that this was not an issue in the ASC setting because it is possible to use claims to determine if a patient underwent surgery at an ASC then went to the emergency department at another facility; therefore, this exclusion was not included.
- The Committee raised no concerns regarding the exclusions for this measure.

Standing Committee Recommendation for Endorsement: **Yes-16**; **No-0**

6. Public and Member Comment

NQF received three public and member comments concerning the measure's specifications, measure validity, the lack of sociodemographic risk adjustment, and concerns about whether meaningful differences in performance are actionable enough to improve the quality of surgical care. Commenters questioned the inclusion of skin procedures in the measure specifications because general surgeons do not routinely perform these procedures. Commenters also questioned whether skin procedures were included to boost low case volume. Two comments noted that the measure should be risk adjusted for social risk factors, such as socioeconomic status (SES), for providers who serve low SES clients. One commenter pointed out that unplanned visits are not always in the surgeon's control and could be related to issues of access to care. Submitted comments also noted that the measure is "topped out" and does not provide enough variation in performance to discern quality of care.

The developer provided the following response:

> **Measure Outcome** - The commenter stated that the "readmission measure is not a good proxy for driving improvement in surgical care." We would like to clarify that the measure under review by the NQF (NQF ID 3357) is not a readmission measure. The measure's outcome is any unplanned hospital visit, defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission, occurring within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC). The outcome of hospital visits is the focus of this measure because it is a broad, patient-centered outcome that captures the full range of hospital visits resulting from adverse events or poor care coordination following an ASC general surgery procedure. This measure's goal is to assess and illuminate variation in risk-adjusted hospital visits following surgery, for quality improvement and public reporting.
>
> **Alignment with Registry-Based Measures** - The commenter "believes that surgical measurement should be built on four key principles: 1) setting the standards, 2) building the right infrastructure, 3) using the right data, and 4) verifying with outside experts," and advocates that ASC measures "include standards-based facility-level verification programs, patient reported experience (PRE) and outcome (PRO) measures, and traditional quality measures including registry and claims-based measures."
>
> This 7-day hospital visit measure fits within the above framework. It increases surgeon and ASC accountability for and awareness of patient outcomes during the post-surgical period, and provides facilities with patient-level data on outcomes to inform quality improvement that ASCs currently lack. The availability of linkable Medicare claims data to calculate the risk-adjusted measure and link patient outcomes, procedure, and risk factor data across settings makes this a low-burden measure that can provide valuable information and complement registry-based, surgery-society developed measures such as PROs.
>
> We would like to further clarify that our measure development process is aligned with the four key principles that the commenter identified as foundational for surgical quality measurement. We built the measure using standards for quality measure development set forth by CMS in its

Measure Management System Blueprint. The measure was developed with input from general surgery consultants, a national Technical Expert Panel, and the public.

Usability and Actionable Information - Two commenters expressed concern that the measure would be of limited utility, and that the information it provides is not actionable.

For ASCs, we believe measuring and publicly reporting claims-based, risk-adjusted measure scores will encourage ASCs to engage in quality improvement and lead to better patient care over time. Further, CMS plans to implement the measure to optimize its usability. Prior to public reporting, CMS anticipates providing claims-detail and facility-specific reports, as the Agency does for other outcome measures. These reports will allow ASCs to see patient 7-day outcomes that are currently not visible to them. This information will help ASCs understand their performance, inform quality improvement efforts, and improve the care they provide to patients.

Variation in Performance Scores and Identification of Outliers - All three commenters expressed their view that there is not enough variation in the measure results to show meaningful differences between facilities. One commenter expressed concern that the measure identifies relatively few outliers as better or worse than expected.

We appreciate the commenters' concerns. The measure score results, however, do present a clinically meaningful range in risk-adjusted outcome rates. As presented in the public comment technical report using Medicare FFS CY 2015 data, we found that the facility measures scores ranged from 0.94% to 4.55%, with a median risk-standardized hospital visit rate of 2.19% (the 25th and 75th percentiles were 2.03% and 2.46%, respectively). The variation in these rates provides a quality signal, and reporting facility-level measure scores will improve transparency and promote quality improvement.

To assist consumers with interpreting the measure, we provide a descriptive category of facility quality (better than, worse than, or no different than the national rate); to provide ASCs and other users with richer insight into performance, we provide the estimated 7-day hospital visit rate and the 95% interval estimate (uncertainty estimate) around that rate. As the commenters pointed out, the descriptive approach categorizes relatively few facilities as outliers. The approach to categorizing facility outliers is very conservative by design. It uses 95% confidence interval (uncertainty) estimates to identify outliers.

Measuring quality of care associated with general surgery procedures performed at ASCs would bring awareness to ASCs and provide valuable data to patients. As intended, we expect this measure will promote patient-centered improvement in care provided at ASCs, because measurement coupled with transparency will make visible, for the first time, the rate of hospital visits after general surgery ASC procedures to both patients and ASCs.

Emergency Department (ED) Visits and Observation Stays - One commenter was concerned that the planned admissions algorithm was not applied to ED visits or hospital observation stays, and that counting all ED visits as unplanned did not account for lack of "patient access to care in the desirable setting." As the commenter noted, we have previously stated that while we understand that the ED and hospital observation setting may be used for planned care at times,

the measure is structured to count these events because these settings are not usually a desirable setting for planned care from the patient's point of view.

Also, ASCs are expected to limit their cases to those that can be safely performed outside the hospital setting. Higher rates of serious but potentially preventable complications that result in ED visits and observation stays may be a sign of poorer quality ASC care. ASCs can reduce the likelihood of these serious complications by emphasizing patient safety and reducing rates of complications or harm events, and by discharge planning that anticipates the need for potential office-based follow up care.

Measure Cohort - One commenter noted that this measure "is meant to capture all other routinely performed outpatient surgical procedures," unlike the other measures in CMS's ASCQR program that focus on colonoscopy, orthopedic, or urology procedures. For this measure, we clarify that we targeted procedures that fall within the scope of general surgery, including those performed by other surgical specialists. We combined these procedures because they share the risk of post-surgery hospital visits within 7 days, they share common reasons for return to the hospital, and the risk of hospital visits following these procedures can be mitigated through similar strategies.

Additionally, three commenters expressed concerns that the measure includes many skin and plastic surgery procedures. We understand the commenters' concerns that over half the procedures in the cohort are skin procedures and concern that these procedures were included to increase sample size. The commenters also stated that many of the included procedures are performed by surgeons other than general surgeons.

As noted above, we included procedures within the scope of practice of general surgery even though these procedures are often performed by other subspecialists because they share common features that allow us to combine them for assessing quality. However, the commenters are correct that in addition to general surgeons, other types of surgeons and non-surgical specialists perform skin and other procedures included in the cohort. As we clarified above, we included these procedures in a single measure because the procedures share (1) a risk of post-surgery hospital visits within 7 days and (2) relatively similar reasons for return to the hospital. Members of our TEP also felt the care practices that would best lower the risk of hospital visits were similar across these procedures. Procedural volume was not a criterion for inclusion of procedures in the cohort.

Further, we identified and refined the group of procedures to include in the cohort through multi-stakeholder review and input from a national TEP, general surgery consultants, and the public. For example, in light of comments receive on the measure during measure development public comment, we re-reviewed all of the individual CPT codes within CCS categories and removed 15 individual procedures (CPT® codes) from the measure that were outside the scope of general surgery practice.

Adjustment for Social Risk Factors -Two commenters expressed concern that the measure is not adjusted for social risk factors.

As previously acknowledged in the conceptual model we presented in the NQF application, we agree that patients' socioeconomic status (SES) affects health and health outcomes in important ways.

Our intent when developing and testing the measure was to be responsive to the NQF guidelines for measure developers on SES. We therefore examined three patient-level indicators of social risk that are reliably available for all Medicare beneficiaries: 1) Medicare-Medicaid dual eligibility, 2) race, and 3) the AHRQ SES Index. The variables used are aligned with those the National Academy of Medicine committee identified as available for use in outcome measures. We examined whether these factors were associated with increased risk in hospital visits after adjusting for other risk factors and evaluated the impact of social risk factors on ASC-level measure scores.

While including each of these risk factors in our models indicated a statistically significant association after controlling for other risk-adjusters, results showed that the effect of social risk factors on hospital visit rates in the fully adjusted model was significant but small. Additionally, inclusion of these variables did not change ASCs' risk-standardized hospital visit ratios (RSHVRs) or their performance on the measures. Correlation coefficients between RSHVRs with and without adjustment for these factors were near 1 (0.998, 1.000, and 0.999 for dual-eligible, African-American, and low SES patients, respectively) and mean differences in RSHVRs were near zero (0.0000, -0.0001, and -0.0002 for dual-eligible, African-American, and low SES patients, respectively).

In addition, we examined the relationship between the proportion of low SES patients and the facility-level score, focusing on facilities with the highest proportion of dual eligible patients (fourth quartile). This analysis did not show a clear relationship between the proportion of low SES patients and the facility-level score (Pearson correlation coefficient = -0.17).

Based on these findings, and a consideration of how social risk factors affect patients in the ambulatory setting and the importance of efforts to address all patients' needs, CMS decided to not adjust the models for these social risk factors; not adjusting is not likely to lead to unintended consequences, or burden providers that serve low SES patients, and adjusting may mask quality differences. However, once the measure is implemented, CMS will monitor this measure, as with others, for unintended consequences related to disparities.

Finally, we acknowledge the importance of optimizing measures to incentivize high quality care for all while ensuring providers caring for low SES patients are not disadvantaged on the measures. CORE, with CMS, is exploring alternative modeling approaches that better illuminate how ASCs and their patients contribute to SES-related risks, and will continue to explore incorporating social risk factors into quality measures.

Attribution of Outcomes - We appreciate the commenter's continued review of the top reasons for any hospital visit within 7 days of general surgery procedures.

As previously clarified, the diagnoses referred to by the commenter (Table 4 of measure documentation) can occur during an admission, ED visit, or observation stay. If they occur during an admission, then all but one type (acquired absence of breast and nipple) are identified as planned admissions and are not counted in the measure outcome. If these diagnoses (including

cancer diagnoses) occur as part of an ED visit or observation stay, they are included in the measure outcome because ED visits and observation stays are not routinely used for planned care. We understand that the ED and hospital observation setting may be used for planned care at times, but the measure is structured to count these events because these settings are not usually a desirable setting for planned care from the patient's point of view.

CORE is committed to evaluating whether refining the CMS planned admission algorithm will better capture planned admissions for the diagnoses flagged by comments. As such, during measure reevaluation, CORE will consider updating the planned admission algorithm to include acquired absence of breast and nipple so that admissions with this diagnosis would not be counted in the measure outcome.

Measure Title - We appreciate the commenter's suggestion to rename the measure. We have already renamed the measure to address this concern. The measure was previously named "Hospital Visits After General Surgery Ambulatory Surgical Center Procedures," and we revised its title to be "Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers." Our intent was to emphasize the scope of the procedures included in the measure cohort rather than the types of specialists performing them. The scope of the measure was defined by the scope of practice of general surgeons. Thus, we have chosen not to include "skin procedures" or "plastic repair" in the title given that many types of procedures in the measure are performed by both general surgeons and other specialists, and including one specific procedure type in the title would make the scope of the measure less clear. We believe the measure title accurately reflects what it assesses. CMS welcomes continued suggestions on the best name for the measure.

Low ASC Case Volumes - The commenter expressed concern that this measure would provide insufficient information for low-volume facilities. We understand the commenter's concern that the measure would not provide sufficient information about the quality of care in individual low-volume facilities. For this measure, as is done for other risk-adjusted outcome measures, CMS will set minimum-volume requirements for reporting and only report scores for ASCs that have an adequate number of cases to generate reliable estimates. For example, for publicly reported outcome measures such as CMS's hospital readmission measures, CMS implemented minimum volume requirements for reporting.

The commenters also expressed concern about CMS implementing this measure using an inadequate amount of data. The commenter referenced CMS's use of only 1 year of claims data for implementation of another risk-adjusted outcome measure (ASC-12: Facility Seven-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy) in the ASCQR program, instead of 3 years of claims data. For this general surgery measure, CMS will consider using multiple years of claims data for public reporting. We calculated measure score (test, retest) reliability for a 2-year reporting period and found that the agreement (intraclass coefficient) between the two RSHVR values for each ASC was 0.526, indicating moderate measure score reliability. NQF committees consider their evaluation criteria to be rigorous, which state that moderate or high reliability is typically required for endorsement.

Prior to measure implementation, CMS will evaluate the amount of data required for reliable measure score calculation, and determine the number of years of data to use, weighing the tradeoffs between

having an adequate number of cases for the greatest number of facilities and ensuring data used are timely.

Committee members were satisfied with the developer's response to the public comments, and agreed that the inclusion of skin procedures is not detrimental to the measure. The Committee stated that skin procedures should be included because they are an increasing part of care provided at ASCs. They also noted that the measure fills a gap in care and provides valuable performance data to ASCs that they would not otherwise receive. The Committee also noted that the ability of the risk model to discriminate differences in patient characteristics could be improved (c-statistic =0.69) and that they would like to see a more robust c-statistic and additional data on the upward mobility of patients when the measure is resubmitted for endorsement consideration.

7. Consensus Standards Approval Committee (CSAC)

CSAC Endorsement Decision: **Yes-17; No-0** (June 6, 2018: Approved for endorsement)

8. Appeals

No appeals were received.

1790 Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer

Submission | Specifications

Description: Percentage of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

Numerator Statement: Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

Denominator Statement: Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer

Exclusions: Patients were excluded if they had an extrapleural pneumonectomy, completion pneumonectomy, carinal pneumonectomy, occult carcinoma or benign disease on final pathology, or an urgent, emergent, or palliative operation. Furthermore, patients with missing age, sex, discharge mortality status, and predicted forced expiratory volume in 1 second were also excluded.

Adjustment/Stratification: Statistical risk model

Level of Analysis: Facility

Setting of Care: Inpatient/Hospital

Type of Measure: Outcome

Data Source: Other, Registry Data

Measure Steward: The Society of Thoracic Surgeons

STANDING COMMITTEE MEETING [02/01/2018]

1. Importance to Measure and Report: **The measure meets the Importance criteria**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Yes-16**; **No-0**; 1b. Performance Gap: **H-5**; **M-11**; **L-0**; **I-0;**

Rationale:

- Updated evidence for this maintenance measure is based on a study showing that operative mortality and complication rates are low for lung cancer resection among surgeons participating in the Society of Thoracic (STS) General Thoracic Surgery Database (GTSD).
- Performance data showed variation in performance from 0.47 percent to 2.37 percent, among 217,844 patient records at 213 sites.
- The Committee agreed that there is still a gap in performance among the different practices.
- The Committee raised no concerns with the evidence and performance gap for this maintenance measure.

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2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity)

2a. Reliability: **H-7**; **M-9**; **L-0**; **I-0** 2b. Validity: **M-8**; **L-8**; **I-0**

Rationale:

- Using Bayesian inference methods on data from 231 hospitals and 27,844 patient records, reliability was measured at 0.50 for 231 hospitals, rising to 0.53 for 216 hospitals performing at least 10 procedures, and to 0.84 in hospitals performing at least 200 procedures. Validity was assessed using percent agreement of data elements; the agreement rate was 96.78 percent for overall data accuracy, ranging from 94.3 to 99.0 percent.
- The Committee noted there is a change to the measure specifications – from monitoring "bleeding requiring reoperation" to "an unexpected return to the operating room"; the Committee agreed that this was an appropriate change. The developer clarified that this change included more events or indications for return to the operating room rather than just bleeding.
- In their discussion on validity, the Committee noted that this measure was similar to #3294 *STS Lobectomy for Lung Cancer Composite Score* in that validity was high and the percent of missing data had been decreasing but did not lead to a bias in calculation of the measure. The developer noted that they had addressed missing data by requiring programs to have a 95.0 percent completion rate for the outcome field "operative mortality" in 2016, and a completion rate of 98.0 percent by 2017.

3. Feasibility: H-6; M-9; L-0; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c.Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

Rationale:

- The developer reports that data elements are generated and used by healthcare personnel during the provision of care. STS GTSD participants pay an annual participant fee of $550-$700 depending on whether the participant is an STS member.
- The Committee raised no concerns with the feasibility of the measure.

4. Usability and Use:

(Used and useful to the intended audiences for 4a. Accountability and Transparency; 4b. Improvement; and 4c. Benefits outweigh evidence of unintended consequences)

4a. Use**: Pass-16; No Pass-0** 4b. Usability: **H-7; M-9; L-0; I-0**

Rationale:

- The Committee questioned whether data were publically reported. The developer articulated plans public report results of the measure in 2019.
- The Committee questioned what percentage of total thoracic surgeries are captured in the STS database and how many thoracic surgeons participate in the registry. The developer noted that the database captures data on surgeries from a large number of primary thoracic surgeons; however, this information is not widely available for adult cardiac surgeons or general surgeons who may perform a small number of thoracic surgeries. The Committee agreed these surgeons could benefit from participating in the database. Another Committee member noted that the STS GTSD is now open to all surgeons and non-STS members, demonstrating opportunities to share data in the database with other surgeons.
- A Committee member shared data from a presentation Penetration, Completeness, and Representativeness of the STS GTSD for Lobectomy at the annual STS meeting. The Committee member reported that although STS lobectomy procedures are low volume, representing 25.0 percent of lobectomy procedures in the United States when compared to lobectomy procedures in the Centers for Medicare & Medicaid Services (CMS) database, STS participants outperformed CMS participants. Participants in the STS database had shorter length of stay and half the mortality rate compared to the participants reporting to the CMS database; both outcomes were reported to be highly statistically significant.

5. Related and Competing Measures

- Measure #1790 is related to #3294 *STS Lobectomy for Lung Cancer Composite Score*. Measure #1790 includes a broader range of lung resection procedures than the Lobectomy Composite, and therefore includes a larger number of cases and potentially provides performance data to more general thoracic surgeons.

Standing Committee Recommendation for Endorsement: **Yes-16**; **No-0**

6. Public and Member Comment

No public or member comments submitted.

7. Consensus Standards Approval Committee (CSAC)

CSAC Endorsement Decision: **Yes-17; No-0** (June 6, 2018: Approved for continued endorsement)

8. Appeals

No appeals were received.

3294 STS Lobectomy for Lung Cancer Composite Score

Submission | Specifications

Description: The STS Lobectomy Composite Score comprises two domains:

1. Operative Mortality (death during the same hospitalization as surgery or within 30 days of the procedure)

2. Presence of at least one of these major complications: pneumonia, acute respiratory distress syndrome, bronchopleural fistula, pulmonary embolus, initial ventilator support greater than 48 hours, reintubation/respiratory failure, tracheostomy, myocardial infarction, or unexpected return to the operating room.

The composite score is created by a weighted combination of the above two domains resulting in a single composite score. In addition to receiving a numeric score, participants are assigned to rating categories designated by the following:

1 star: lower-than expected performance

2 stars: as-expected-performance

3 start: higher-than-expected-performance

Numerator Statement: The STS Lobectomy Composite Score comprises two domains:

1. Operative Mortality (death during the same hospitalization as surgery or within 30 days of the procedure)

2. Presence of at least one of these major complications: pneumonia, acute respiratory distress syndrome, bronchopleural fistula, pulmonary embolus, initial ventilator support greater than 48 hours, reintubation/respiratory failure, tracheostomy, myocardial infarction, or unexpected return to the operating room.

The composite score is created by a weighted combination of the above two domains resulting in a single composite score. Operative mortality and major complications were weighted inversely by their respective standard deviations across participants. This procedure is equivalent to first rescaling mortality and complications by their respective standard deviations and then assigning equal weighting to the rescaled mortality rate and rescaled complication rate. This is the same methodology used for other STS composite measures.

In addition to receiving a numeric score, participants are assigned to rating categories designated by the following:

1 star: lower-than expected performance

2 stars: as-expected-performance

3 start: higher-than-expected-performance

Patient Population: The STS GTSD was queried for all patients treated with lobectomy for lung cancer between January 1, 2014, and December 31, 2016. We excluded patients with non-elective status, occult or stage 0 tumors, American Society of Anesthesiologists class VI, and with missing data for age, sex, or discharge mortality status.

Time Window: 01/01/2014 - 12/31/2016

Model variables: Variables in the model: age, sex, year of operation, body mass index, hypertension, steroid therapy, congestive heart failure, coronary artery disease, peripheral vascular disease, reoperation, preoperative chemotherapy within 6 months, cerebrovascular disease, diabetes mellitus, renal failure, dialysis, past smoker, current smoker, forced expiratory volume in 1 second percent of predicted, Zubrod score (linear plus quadratic), American Society of Anesthesiologists class (linear plus quadratic), and pathologic stage.

Denominator Statement: Number of patients greater than or equal to 18 years of age undergoing elective lobectomy for lung cancer

Exclusions: Patients were excluded with non-elective status, occult or stage 0 tumors, American Society of Anesthesiologists class VI, and with missing data for age, sex, or discharge mortality status.

Adjustment/Stratification: Statistical risk model

Level of Analysis: Facility

Setting of Care: Inpatient/Hospital

Type of Measure: Composite

Data Source: Other, Registry Data

Measure Steward: The Society of Thoracic Surgeons

STANDING COMMITTEE MEETING [02/06/2018]

1. Importance to Measure and Report: **The measure meets the Importance criteria**

(1a. Evidence, 1b. Performance Gap, 1c. Composite – Quality Construct and Rationale)

1a. Evidence: **Yes-16**; **No-0**; 1b. Performance Gap: **H-3**; **M-12**; **L-0**; **I-0;** 1c. Composite – **H-9**; **M-7**; **L-0**; **I-0**

Rationale:

- The developer reported that data in the Society of Thoracic Surgeons (STS) General Thoracic Surgery Database (GTSD) show a reduction in perioperative morbidity and equivalent long-term survival when minimally invasive approaches for lobectomy are used. Specifically, STS data have shown that minimally invasive lung cancer resection has a 50.0 percent reduction in major complications compared with a thoracotomy approach, adjusted for age, sex, and comorbidities.
- The Committee stated that the evidence presented supports the measure.
- The Committee agreed there is a gap based on the performance data presented by the developer. Data collected during two separate timeframes during 2013-2016 indicated a performance rate of 95.0 percent to 98.0 percent, for approximately 200-300 participants and over 24,000 operations.
- In terms of quality construct, this measure is based on a combination of an operative mortality outcome and the risk-adjusted occurrence of any of nine major complications. Participants are scored for each domain (mortality and complication), and an overall composite score which is created by a weighted combination of the two domains. Participants are also assigned a

performance rating designated by one to three stars. The developer reported that since mortality rates for thoracic surgery have declined, it can be difficult to differentiate performance based on mortality alone because it does not take into account that not all operative survivors received equal quality care. The Committee agreed that a composite score from a weighted combination of mortality and operative complications provides a more comprehensive measure of overall surgical quality.

- A Committee member noted that operative mortality is weighted approximately four times that of a major complication in the composite, consistent with STS adult cardiac surgery quality measures. Committee members also noted that this is an improvement from its previous lung cancer resection model in which mortality and major morbidity were weighted equally.
- Overall, the Committee agreed that the quality construct and rationale for the composite are explicitly stated and logical; and the weighting and approach to the measure construction is described clearly and has been vetted by an expert panel.

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2. Scientific Acceptability of Measure Properties: <u>The measure meets the Scientific Acceptability criteria</u>

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity, 2c. Composite Construction)

2a. Reliability: **H-8**; **M-8**; **L-0**; **I-0** 2b. Validity: **M-16**; **L-0**; **I-0** 2c. Composite Construction: **H-9**; **M-6**; **L-1**; **I-0**

<u>Rationale</u>:

- The Committee noted that the measure is well and clearly specified, and that the measure can consistently be implemented. Committee members also noted that reliability of data elements was supported by external audit of the GTSD, demonstrating high agreement rates and validation of data accuracy. In addition, committee members noted that the NQF Scientific Methods Panel was satisfied with the reliability testing for the measure.
- Committee members noted that validity of the performance score was not tested. Confidence interval testing was performed and only percent agreement was assessed in the analysis. NQF staff clarified that while score-level validity testing is desired, data element testing is acceptable because this is a new measure. For future maintenance evaluations, score-level testing will be required. Overall, the Committee did not have any major concerns regarding the validity of the measure and noted that the NQF Scientific Methods Panel was satisfied with the validity analyses for the measure.
- The Committee did not express additional concerns with the construct of the composite measure and agreed the information provided was sufficient to satisfy the criterion for composite construct.

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3. Feasibility: H-5; M-11; L-0; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c.Susceptibility to inaccuracies/ unintended consequences identified 3d. Data collection strategy can be implemented)

<u>Rationale</u>:

- Feasibility was addressed in terms of its similarity across STS measures; i.e., data for the measure is captured in a standardized way through the STS database of which most surgeons and programs in the United States are members. STS GTSD participants pay an annual participant fee of $550-$700 depending on whether the participant is an STS member.

4. Usability and Use:

(Used and useful to the intended audiences for 4a. Accountability and Transparency; 4b. Improvement; and 4c. Benefits outweigh evidence of unintended consequences)

4a. Use**: Pass-15; No Pass-1** 4b. Usability: **H-9; M-7; L-0; I-0**

Rationale:

- According to the developer, this measure is publicly reported through the STS Public Reporting Task force. The task force develops public report cards that are consumer centric. In terms of accountability, results are shared with participants in the STS GTSD for quality improvement purposes.
- Committee members noted that while performance variation is not wide, performance results for this measure are still considered useful for both accountability and performance improvement activities.

5. Related and Competing Measures

- This measure is related to 1790 *Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer*. Measure #1790 includes a broader range of lung resection procedures than the Lobectomy Composite, and therefore includes a larger number of cases and potentially provides performance data for more general thoracic surgeons.

Standing Committee Recommendation for Endorsement: **Yes-16**; **No-0**

6. Public and Member Comment

No public or member comments submitted.

7. Consensus Standards Approval Committee (CSAC)

CSAC Endorsement Decision: **Yes-17; No-0** (June 6, 2018: Approved for endorsement)

8. Appeals

No appeals were received.

Measures Withdrawn from Consideration

One measure previously endorsed by NQF was not re-submitted by the measure steward/developer, and endorsement has been removed.

Measure	Reason for withdrawal
0534 Hospital Specific Risk-Adjusted Measure of Mortality or One or More Major Complications Within 30 Days of a Lower Extremity Bypass (LEB)	Developer does not have the resources and personnel to update the measure.

Appendix B: Surgery Portfolio—Use in Federal Programs[a]

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
0225	At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer	N/A
0456	Participation in a Systematic National Database for General Thoracic Surgery	N/A
0564/3056	Cataracts: Complications within 30 Days Following Cataract Surgery Requiring Additional Surgical Procedures	Hospital Outpatient Quality Reporting (Rescinded) Medicare and Medicaid Electronic Health Record Incentive Program for Eligible Professionals (No Status) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0565/3057	Cataracts: 20/40 or Better Visual Acuity within 90 Days Following Cataract Surgery	Medicare and Medicaid Electronic Health Record Incentive Program for Eligible Professionals (No Status) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
1536	Cataracts: Improvement in Patient's Visual Function within 90 Days Following Cataract Surgery	Ambulatory Surgical Center Quality Reporting (Implemented) Hospital Compare (Implemented) Hospital Outpatient Quality Reporting (Implemented) Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
1790	Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer	N/A
3294	STS Lobectomy for Lung Cancer Composite Score	N/A
3357	Facility Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers	N/A

[a] Per CMS Measure Inventory as of 07/27/2018

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
3366	Hospital Visits after Urology Ambulatory Surgical Center Procedures	N/A
0697	Risk Adjusted Case Mix Adjusted Elderly Surgery Outcomes Measure	N/A
0706	Risk Adjusted Colon Surgery Outcome Measure	N/A
0127	Preoperative Beta Blockade	N/A
0134	Use of Internal Mammary Artery (IMA) in Coronary Artery Bypass Graft (CABG)	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
1519	Statin Therapy at Discharge after Lower Extremity Bypass (LEB)	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
1523	Rate of Open Repair of Abdominal Aortic Aneurysms (AAA) Where Patients Are Discharged Alive	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
1534	In-hospital mortality following elective EVAR of AAAs	N/A
1540	Postoperative Stroke or Death in Asymptomatic Patients undergoing Carotid Endarterectomy	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
1550	Hospital-level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)	Hospital Compare (Implemented) Hospital Inpatient Quality Reporting (Implemented) Hospital Value-Based Purchasing (Finalized)
1551	Hospital-level 30-day, all-cause risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)	Hospital Compare (Implemented) Hospital Inpatient Quality Reporting (Implemented) Hospital Readmission Reduction Program (Implemented)
0114	Risk-Adjusted Postoperative Renal Failure	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0115	Risk-Adjusted Surgical Re-exploration	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0117	Beta Blockade at Discharge	N/A
0118	Anti-Lipid Treatment Discharge	N/A
0119	Risk-Adjusted Operative Mortality for CABG	Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0120	Risk-Adjusted Operative Mortality for Aortic Valve Replacement (AVR)	N/A
0121	Risk-Adjusted Operative Mortality for Mitral Valve (MV) Replacement	N/A

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
0122	Risk-Adjusted Operative Mortality for Mitral Valve (MV) Replacement + CABG Surgery	N/A
0123	Risk-Adjusted Operative Mortality for Aortic Valve Replacement (AVR) + CABG Surgery	N/A
0127	Preoperative Beta Blockade	N/A
0129	Risk-Adjusted Postoperative Prolonged Intubation (Ventilation)	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized
0130	Risk-Adjusted Deep Sternal Wound Infection	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0131	Risk-Adjusted Stroke/Cerebrovascular Accident	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0134	Use of Internal Mammary Artery (IMA) in Coronary Artery Bypass Graft (CABG)	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
0236	Coronary Artery Bypass Graft (CABG): Preoperative Beta-Blocker in Patients with Isolated CABG Surgery	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0339	RACHS-1 Pediatric Heart Surgery Mortality Rate (PDI 06)	N/A
0340	RACHS-1 Pediatric Heart Surgery Volume (PDI 7)	N/A
0354	Hip Fracture Mortality Rate (IQI 19)	N/A
0357	Abdominal Aortic Aneurysm (AAA) Repair Volume (IQI 4)	N/A
0359	Abdominal Aortic Aneurysm (AAA) Repair Mortality Rate (IQI 11)	Hospital Inpatient Quality Reporting (Removed)
0365	Pancreatic Resection Mortality Rate (IQI 9)	N/A
0366	Pancreatic Resection Volume (IQI 2)	N/A
0465	Perioperative Anti-platelet Therapy for Patients undergoing Carotid Endarterectomy	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0533	Postoperative Respiratory Failure Rate (PSI 11)	Hospital Inpatient Quality Reporting (Removed)
0564	Cataracts: Complications within 30 Days Following Cataract Surgery Requiring Additional Surgical Procedures	Hospital Outpatient Quality Reporting (Rescinded) Medicare and Medicaid Electronic Health Record Incentive Program for Eligible Professionals (No Status) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0696	STS CABG Composite Score (Composite Measure)	N/A

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
0697	Risk Adjusted Case Mix Adjusted Elderly Surgery Outcomes Measure	N/A
0706	Risk Adjusted Colon Surgery Outcome Measure	N/A
0732	Surgical Volume for Pediatric and Congenital Heart Surgery: Total Programmatic Volume and Programmatic Volume Stratified by the 5 STAT Mortality Categories	N/A
0733	Operative Mortality Stratified by the 5 STAT Mortality Categories	Merit-Based Incentive Payment System (MIPS) Program (Finalized)
0734	Participation in a National Database for Pediatric and Congenital Heart Surgery	N/A
1501	Risk-Adjusted Operative Mortality for Mitral Valve (MV) Repair	N/A
1502	Risk-Adjusted Operative Mortality for Mitral Valve (MV) Repair + CABG Surgery	N/A
1536	Cataracts: Improvement in Patient's Visual Function within 90 Days Following Cataract Surgery	Ambulatory Surgical Center Quality Reporting (Implemented) Hospital Compare (Implemented) Hospital Outpatient Quality Reporting (Implemented) Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
1543	Postoperative Stroke or Death in Asymptomatic Patients undergoing Carotid Artery Stenting (CAS)	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
1790	Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer	N/A
2038	Performing vaginal apical suspension at the time of hysterectomy to address pelvic organ prolapse	Medicare and Medicaid Electronic Health Record Incentive Program for Eligible Professionals (Declined) Medicare Physician Quality Reporting System (Declined) Physician Compare (Declined) Physician Value-Based Payment Modifier (Declined) Medicare Shared Savings Program (Declined)
2052	Reduction of Complications through the use of Cystoscopy during Surgery for Stress Urinary Incontinence	N/A
2063	Performing cystoscopy at the time of hysterectomy for pelvic organ prolapse to detect lower urinary tract injury	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
2558	Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Coronary Artery Bypass Graft (CABG) Surgery	Hospital Compare (Implemented) Hospital Inpatient Quality Reporting (Implemented) Hospital Value-Based Purchasing (Finalized)
2561	STS Aortic Valve Replacement (AVR) Composite Score (Composite Measure)	N/A

NQF #	Title	Federal Programs: Finalized or Implemented as of December 30, 2017.
2563	STS Aortic Valve Replacement (AVR) + Coronary Artery Bypass Graft (CABG) Composite Score (Composite Measure)	N/A
2677	Preoperative evaluation for stress urinary incontinence prior to hysterectomy for pelvic organ prolapse	N/A
2681	Perioperative Temperature Management	Medicare Physician Quality Reporting System (Implemented) Physician Feedback/Quality Resource Use Report (Implemented) Physician Value-Based Payment Modifier (Implemented) Merit-Based Incentive Payment System (MIPS) Program (Finalized)
2683	Risk-Adjusted Operative Mortality for Pediatric and Congenital Heart Surgery	N/A
2687	Hospital Visits after Hospital Outpatient Surgery	Hospital Outpatient Quality Reporting (Finalized)
3030	STS Individual Surgeon Composite Measure for Adult Cardiac Surgery (Composite Measure)	N/A
3031	STS Mitral Valve Repair/Replacement (MVRR) Composite Score (Composite Measure)	N/A
3032	STS Mitral Valve Repair/Replacement (MVRR) + Coronary Artery Bypass Graft (CABG) Composite Score (Composite Measure)	N/A

Appendix C: Surgery Standing Committee and NQF Staff

STANDING COMMITTEE

Lee Fleisher, MD (Co-Chair)
Professor and Chair of Anesthesiology, University of Pennsylvania/American Society of Anesthesiologists
Philadelphia, Pennsylvania

William Gunnar, MD, JD (Co-Chair)
Director, National Surgery Program Office, Veterans Health Administration
Washington, DC

Karl Bilimoria, MD, MS
John B. Murphy Professor of Surgery; Vice President - Quality, Northwestern Medicine; Director, Surgical Outcomes & Quality Improvement Center (SOQIC); Vice Chair for Quality, Department of Surgery, Feinberg School of Medicine, Northwestern University
Chicago, Illinois

Robert Cima, MD, MA
Professor of Surgery, Mayo Clinic
Rochester, Minnesota

Richard Dutton, MD, MBA
Chief Quality Officer, United States Anesthesia Partners
Park Ridge, Illinois

Elisabeth Erekson, MD, MPH
Interim Chair, Department of Obstetrics and Gynecology at the Geisel School of Medicine Dartmouth Hitchcock Medical Center
Manchester, New Hampshire

Frederick Grover, MD
Professor of Cardiothoracic Surgery, University of Colorado School of Medicine
Aurora, Colorado

John Handy, MD
Thoracic Surgeon, American College of Chest Physicians
Portland, Oregon

Mark Jarrett, MD, MBA
Chief Quality Officer, Associate Chief Medical Officer, North Shore-LIJ Health System
Great Neck, New York

Clifford Ko, MD, MS, MSHS, FACS
Director, Division of Research and Optimal Patient Care, American College of Surgeons/Professor of Surgery, Department of Surgery, UCLA School of Medicine, American College of Surgeons/UCLA School of Medicine
Chicago, Illinois

Barbara Levy, MD, FACOG, FACS
Vice President, Health Policy, American College of Obstetricians and Gynecologists
Washington, DC

Barry Markman, MD
Senior Medical Director Medicaid, Aetna
Las Vegas, Nevada

Lawrence Moss, MD
Surgeon-in-Chief, Nationwide Children's Hospital
Columbus, Ohio

Amy Moyer
Manager of Value Measurement, The Alliance
Fitchburg, Wisconsin

Keith Olsen, PharmD, FCCP, FCCM
Professor and Dean, College of Pharmacy, University of Arkansas for Medical Sciences
Omaha, Nebraska

Lynn Reede, DNP, MBA, CRNA
Senior Director, Professional Practice, American Association of Nurse Anesthetists
Park Ridge, Illinois

Christopher Saigal, MD, MPH
Professor, UCLA
Los Angeles, California

Salvatore T. Scali, MD
Assistant Professor of Vascular Surgery, University of Florida-Gainesville
Gainesville, Florida

Allan Siperstein, MD
Chairman Endocrine Surgery, Cleveland Clinic
Cleveland, Ohio

Joshua D. Stein, MD, MS
Associate Professor, University of Michigan, Department of Ophthalmology & Visual Sciences, Department of Health Management & Policy, Director, Center for Eye Policy and Innovation
Ann Arbor, Michigan

Larissa Temple, MD
Colorectal Service, Department of Surgery, Memorial Sloan-Kettering Cancer Center
New York, New York

Melissa Thomason, MS, PMP
Patient/Family Advisor, Vidant Health
Pinetops, North Carolina

Barbee Whitaker, PhD
Director, American Association of Blood Banks
Bethesda, Maryland

A.J. Yates, MD
Associate Professor and Vice Chairman for Quality Management, Department of Orthopedic Surgery, University of Pittsburgh Medical Center
Pittsburgh, Pennsylvania

NQF STAFF

Elisa Munthali, MPH
Senior Vice President, Quality Measurement

Melissa Marinelarena, RN, MPA, CPHQ
Senior Director

Kathryn Goodwin, MS
Senior Project Manager

Christy Skipper, MS
Project Manager

Mauricio Menendez, MS
Project Analyst

Appendix D: Measure Specifications

3357 Facility Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers

STEWARD

Centers for Medicare & Medicaid Services (CMS)

DESCRIPTION

Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission

TYPE

Outcome

DATA SOURCE

Claims, Enrollment Data

LEVEL

Facility

SETTING

Outpatient services

NUMERATOR STATEMENT

The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within 7 days of a general surgery procedure performed at an ASC.

NUMERATOR DETAILS

Outcome Definition

The outcome is unplanned hospital visits, defined as an ED visit, observation stay, or unplanned inpatient admission, occurring within 7 days of the general surgery procedure performed at an ASC identified using Centers for Medicare & Medicaid Services (CMS) Medicare administrative claims data.

Time Period for Data

Numerator time window: 7 days after ASC procedures for unplanned hospital visits.

Denominator time window: General surgery ASC procedures performed during the measurement period.

Identification of Planned Admissions

The measure outcome includes hospital visits within the first 7 days following the procedure, unless that inpatient admission is deemed a “planned” admission. We applied CMS’s Planned Readmission Algorithm Version 4.0 to identified planned admissions [1]. Planned admissions are

defined as those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. CMS seeks to count only unplanned admissions in the measure outcome because variation in planned admissions does not reflect quality differences. The algorithm (see the flowchart in the Data Dictionary, first tab, "S.6 Planned Adm Alg Flowchart") identifies inpatient admissions that are typically planned and may occur after the patient's index general surgery procedure, considering a few specific, limited types of care as "planned"(e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses, or with diagnoses that might represent complications of a surgery, as "unplanned" and thus counts these inpatient admissions in the measure outcome.

Details of the planned admission algorithm and codes to identify planned admissions are in the attached Data Dictionary sheet labeled "S.6 Planned Adm Alg."

Definition of ED Visits and Observation Stay

The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims.

The codes used to define ED visits and observation stays are in the attached Data Dictionary sheet labeled "S.6 Numerator-ED Obs Def."

Citations

1. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.

DENOMINATOR STATEMENT

Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

DENOMINATOR DETAILS

Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were

within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

EXCLUSIONS

The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.

EXCLUSION DETAILS

Lack of 7 or more days of continuous enrollment in Medicare FFS after the ASC surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file (unless lack of enrollment was due to death). The procedure must be 7 or more days from the end of the month or the enrollment indicators must be appropriately marked for the month that falls within 7 days of the procedure date (unless disenrollment is due to death), otherwise the procedure is excluded.

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

Not applicable.

TYPE SCORE

Ratio

ALGORITHM

The measure uses a two-level hierarchical logistic regression model to estimate ASC-level risk-standardized hospital visit ratios (RSHVRs). This approach accounts for the clustering of patients within ASCs and variation in sample size across ASCs. The RSHVR is calculated as the ratio of the predicted to the expected number of post-surgical unplanned hospital visits among ASC's patients. For each ASC, the numerator of the ratio is the number of hospital visits predicted for the ASC's patients, accounting for its observed rate, the number and complexity of general surgery procedures performed at the ASC, and the case mix. The denominator is the number of hospital visits expected nationally for the ASC's case/procedure mix. To calculate an ASC's predicted-to-expected (P/E) ratio, the measure uses a two-level hierarchical logistic regression model. The log-odds of the outcome for an index procedure is modeled as a function of the patient demographic, comorbidity, procedure characteristics, and a random ASC-specific intercept. A ratio greater than one indicates that the ASC's patients have more visits than expected, compared to an average ASC with similar patient and procedural complexity. A ratio less than one indicates that the ASC's patients have fewer post-surgical visits than expected, compared to an average ASC with similar patient and procedural complexity. This approach is analogous to an observed-to-expected ratio, but accounts for within-facility correlation of the observed outcome and sample size differences and accommodates the assumption that underlying differences in quality across ASCs lead to systematic differences in outcomes, and is

tailored to and appropriate for a publicly reported outcome measure as articulated in published scientific guidelines [1-3].

Please see Appendix D of the attached technical report for details.

Citations

1. Normand S-LT, Shahian DM. Statistical and clinical aspects of hospital outcomes profiling. Statistical Science. 2007;22(2):206-226.

2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for Statistical Models Used for Public Reporting of Health Outcomes An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation. 2006;113(3):456-462.

3. National Quality Forum. Measure Evaluation Criteria and Guidance for Evaluating Measures for Endorsement. 2015; http://www.qualityforum.org/Measuring_Performance/Submitting_Standards/2015_Measure_Evaluation_Criteria.aspx. Accessed July 26, 2016.

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Not applicable.

1790 Risk-Adjusted Morbidity and Mortality for Lung Resection for Lung Cancer

STEWARD

The Society of Thoracic Surgeons

DESCRIPTION

Percentage of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

TYPE

Outcome

DATA SOURCE

Other, Registry Data

LEVEL

Facility

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer who developed any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, myocardial infarction or operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location).

NUMERATOR DETAILS

Number of patients undergoing elective lung resection for lung cancer for whom:

1. Postoperative events (POEvents - STS GTS Database, v 2.2, sequence number 1710) is marked "Yes" and one of the following items is marked:

a. Reintubation (Reintube - STS GTS Database, v 2.2, sequence number 1850)

b. Need for tracheostomy (Trach - STS GTS Database, v 2.2, sequence number 1860)

c. Initial ventilator support > 48 hours (Vent- STS GTS Database, v 2.2, sequence number 1840)

d. Acute Respiratory Distress Syndrome (ARDS - STS GTS Database, v 2.2, sequence number 1790)

e. Pneumonia (Pneumonia - STS GTS Database, v 2.2, sequence number 1780)

f. Pulmonary Embolus (PE - STS GTS Database, v 2.2, sequence number 1820)

g. Bronchopleural Fistula (Bronchopleural - STS GTS Database, v 2.2, sequence number 1810)

h. Myocardial infarction (MI - STS GTS Database, v 2.2, sequence number 1900)

Or

2. Unexpected return to the operating room (ReturnOR - STS GTS Database, Version 2.2, sequence number 1720) is marked "yes"

Or

3. One of the following fields is marked "dead"

a. Discharge status (MtDCStat - STS GTS Database, Version 2.2, sequence number 2200);

b. Status at 30 days after surgery (Mt30Stat - STS GTS Database, Version 2.2, sequence number 2240)

Please see STS General Thoracic Surgery Database Data Collection Form, Version 2.3-

http://www.sts.org/sites/default/files/documents/STSThoracicDCF_V2_3_MajorProc_Annotated.pdf

DENOMINATOR STATEMENT

Number of patients greater than or equal to 18 years of age undergoing elective lung resection (Open or VATS wedge resection, segmentectomy, lobectomy, bilobectomy, sleeve lobectomy, pneumonectomy) for lung cancer

DENOMINATOR DETAILS

1. Lung cancer (LungCancer - STS GTS Database, v 2.2, sequence number 830) is marked "yes" and Category of Disease – Primary (CategoryPrim - STS GTS Database, v 2.2, sequence number 1300) is marked as one of the following:

(ICD-9, ICD-10)

Lung cancer, main bronchus, carina (162.2, C34.00)

Lung cancer, upper lobe (162.3, C34.10)

Lung cancer, middle lobe (162.4, C34.2)

Lung cancer, lower lobe (162.5, C34.30)

Lung cancer, location unspecified (162.9, C34.90)

2. Patient has lung cancer (as defined in #1 above) and primary procedure is one of the following CPT codes:

Thoracoscopy, surgical; with lobectomy (32663)

Thoracoscopy with therapeutic wedge resection (eg mass or nodule) initial, unilateral (32666)

Thoracoscopy with removal of a single lung segment (segmentectomy) (32669)

Thoracoscopy with removal of two lobes (bilobectomy) (32670)

Thoracoscopy with removal of lung, pneumonectomy (32671)

Thoracotomy with therapeutic wedge resection (eg mass nodule) initial (32505)

Removal of lung, total pneumonectomy; (32440)

Removal of lung, single lobe (lobectomy) (32480)

Removal of lung, two lobes (bilobectomy) (32482)

Removal of lung, single segment (segmentectomy) (32484)

Removal of lung, sleeve lobectomy (32486)

3. Status of Operation (Status - STS General Thoracic Surgery Database, Version 2.2, sequence number 1420) is marked as “Elective”

4. Only analyze the first operation of the hospitalization meeting criteria 1-3

EXCLUSIONS

Patients were excluded if they had an extrapleural pneumonectomy, completion pneumonectomy, carinal pneumonectomy, occult carcinoma or benign disease on final pathology, or an urgent, emergent, or palliative operation. Furthermore, patients with missing age, sex, discharge mortality status, and predicted forced expiratory volume in 1 second were also excluded.

EXCLUSION DETAILS

Cases removed from calculations if any of following fields are checked on the data collection form:

Removal of lung, sleeve (carinal) pneumonectomy (32442)

Removal of lung, total pneumonectomy; extrapleural (32445)

Removal of lung, completion pneumonectomy (32488)

OR if either of the following fields are checked:

Carcinoid tumor of bronchus and lung; benign, typical (209.61., D34.090)

Lung tumor, benign (212.3, D14.30)

OR if Emergent, Urgent, or Palliative is checked under "Status of Operation"

Only general thoracic procedures coded as primary lung or primary esophageal cancer are included in measure calculations, so occult carcinoma is effectively excluded.

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

Not applicable

TYPE SCORE

Rate/proportion

ALGORITHM

Target population is patients undergoing elective lung resection for lung cancer. Emergency procedures were excluded. Outcome is operative mortality (death during the index hospitalization, regardless of timing, or within 30 days, regardless of location) or occurrence of any of the following postoperative complications: reintubation, need for tracheostomy, initial ventilator support > 48 hours, ARDS, pneumonia, pulmonary embolus, bronchopleural fistula, unexpected return to the operating room, or myocardial infarction. Analysis considered 27,844 patients with procedures between 01/01/2012 and 12/31/2014 (36 months). Risk adjustment was achieved with a Bayesian hierarchical model with composite of the above postoperative complications as the outcome. The measure score was estimated with this model.

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Not applicable

3294 STS Lobectomy for Lung Cancer Composite Score

STEWARD

The Society of Thoracic Surgeons

DESCRIPTION

The STS Lobectomy Composite Score comprises two domains:

1. Operative Mortality (death during the same hospitalization as surgery or within 30 days of the procedure)

2. Presence of at least one of these major complications: pneumonia, acute respiratory distress syndrome, bronchopleural fistula, pulmonary embolus, initial ventilator support greater than 48 hours, reintubation/respiratory failure, tracheostomy, myocardial infarction, or unexpected return to the operating room.

The composite score is created by a weighted combination of the above two domains resulting in a single composite score. In addition to receiving a numeric score, participants are assigned to rating categories designated by the following:

1 star: lower-than expected performance

2 stars: as-expected-performance

3 start: higher-than-expected-performance

TYPE

Composite

DATA SOURCE

Other, Registry Data

LEVEL

Facility

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

The STS Lobectomy Composite Score comprises two domains:

1. Operative Mortality (death during the same hospitalization as surgery or within 30 days of the procedure)

2. Presence of at least one of these major complications: pneumonia, acute respiratory distress syndrome, bronchopleural fistula, pulmonary embolus, initial ventilator support greater than 48 hours, reintubation/respiratory failure, tracheostomy, myocardial infarction, or unexpected return to the operating room.

The composite score is created by a weighted combination of the above two domains resulting in a single composite score. Operative mortality and major complications were weighted inversely by their respective standard deviations across participants. This procedure is equivalent to first rescaling mortality and complications by their respective standard deviations and then assigning equal weighting to the rescaled mortality rate and rescaled complication rate. This is the same methodology used for other STS composite measures.

In addition to receiving a numeric score, participants are assigned to rating categories designated by the following:

1 star: lower-than expected performance

2 stars: as-expected-performance

3 start: higher-than-expected-performance

Patient Population: The STS GTSD was queried for all patients treated with lobectomy for lung cancer between January 1, 2014, and December 31, 2016. We excluded patients with non-elective status, occult or stage 0 tumors, American Society of Anesthesiologists class VI, and with missing data for age, sex, or discharge mortality status.

Time Window: 01/01/2014 - 12/31/2016

Model variables: Variables in the model: age, sex, year of operation, body mass index, hypertension, steroid therapy, congestive heart failure, coronary artery disease, peripheral vascular disease, reoperation, preoperative chemotherapy within 6 months, cerebrovascular disease, diabetes mellitus, renal failure, dialysis, past smoker, current smoker, forced expiratory volume in 1 second percent of predicted, Zubrod score (linear plus quadratic), American Society of Anesthesiologists class (linear plus quadratic), and pathologic stage.

NUMERATOR DETAILS

Number of patients undergoing elective lobectomy for lung cancer for whom:

1. Postoperative events (POEvents - STS GTS Database, v 2.2, sequence number 1710) is marked "Yes" and one of the following items is marked:

a. Reintubation (Reintube - STS GTS Database, v 2.2, sequence number 1850)

b. Need for tracheostomy (Trach - STS GTS Database, v 2.2, sequence number 1860)

c. Initial ventilator support > 48 hours (Vent- STS GTS Database, v 2.2, sequence number 1840)

d. Acute Respiratory Distress Syndrome (ARDS - STS GTS Database, v 2.2, sequence number 1790)

e. Pneumonia (Pneumonia - STS GTS Database, v 2.2, sequence number 1780)

f. Pulmonary Embolus (PE - STS GTS Database, v 2.2, sequence number 1820)

g. Bronchopleural Fistula (Bronchopleural - STS GTS Database, v 2.2, sequence number 1810)

h. Myocardial infarction (MI - STS GTS Database, v 2.2, sequence number 1900)

Or

2. Unexpected return to the operating room (ReturnOR - STS GTS Database, Version 2.2, sequence number 1720) is marked "yes"

Or

3. One of the following fields is marked "dead"

a. Discharge status (MtDCStat - STS GTS Database, Version 2.2, sequence number 2200);

b. Status at 30 days after surgery (Mt30Stat - STS GTS Database, Version 2.2, sequence number 2240)

Please see STS General Thoracic Surgery Database Data Collection Form, Version 2.3-

http://www.sts.org/sites/default/files/documents/STSThoracicDCF_V2_3_MajorProc_Annotated.pdf

DENOMINATOR STATEMENT

Number of patients greater than or equal to 18 years of age undergoing elective lobectomy for lung cancer

DENOMINATOR DETAILS

1. Lung cancer (LungCancer - STS GTS Database, v 2.2, sequence number 830) is marked "yes" and Category of Disease – Primary (CategoryPrim - STS GTS Database, v 2.2, sequence number 1300) is marked as one of the following:

(ICD-9, ICD-10)

Lung cancer, main bronchus, carina (162.2, C34.00)

Lung cancer, upper lobe (162.3, C34.10)

Lung cancer, middle lobe (162.4, C34.2)

Lung cancer, lower lobe (162.5, C34.30)

Lung cancer, location unspecified (162.9, C34.90)

2. Patient has lung cancer (as defined in #1 above) and primary procedure is one of the following CPT codes:

Thoracoscopy, surgical; with lobectomy (32663)

Removal of lung, single lobe (lobectomy) (32480)

3. Status of Operation (Status - STS General Thoracic Surgery Database, Version 2.2, sequence number 1420) is marked as “Elective”

4. Only analyze the first operation of the hospitalization meeting criteria 1-3

EXCLUSIONS

Patients were excluded with non-elective status, occult or stage 0 tumors, American Society of Anesthesiologists class VI, and with missing data for age, sex, or discharge mortality status.

EXCLUSION DETAILS

Cases removed from calculations if Emergent, Urgent, or Palliative is checked under "Status of Operation"

OR if T0 is checked under Pathological Staging of the Lung / Lung Tumor: PathStageLungT(1540)

OR if VI is checked under ASA Classification: ASA (1470)

Only general thoracic procedures coded as primary lung or primary esophageal cancer are included in measure calculations, so occult carcinoma is effectively excluded.

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

Not applicable

TYPE SCORE

Rate/proportion

ALGORITHM

Target population is patients treated with lobectomy for lung cancer. Patients were excluded with non-elective status, occult or stage 0 tumors, American Society of Anesthesiologists class VI, and with missing data for age, sex, or discharge mortality status. Outcomes were measured in two domains:

1. Operative Mortality (death during the same hospitalization as surgery or within 30 days of the procedure)

2. Presence of at least one of these major complications: pneumonia, acute respiratory distress syndrome, bronchopleural fistula, pulmonary embolus, initial ventilator support greater than 48 hours, reintubation/respiratory failure, tracheostomy, myocardial infarction, or unexpected return to the operating room.

Time window for analysis was between 01/01/2014 and 12/31/2016.

Analysis considered 24,912 patient records across 233 participant sites.

To form the composite, we rescaled the major complication and operative mortality domains by dividing by their respective standard deviations across STS participants and then added the two domains together. This weighting was then assessed by an expert panel to determine if it provided an appropriate reflection of the relative importance of the two domains.

After rescaling, the relative weights in the final composite of risk-standardized mortality and risk-standardized major morbidity were 0.827 and 0.173, respectively. An implication of this weighting is that a 1 percentage point change in a participant´s risk-adjusted mortality rate has

the same impact as a 4.8 percentage point change in the site´s risk-adjusted morbidity rate. Our expert panel concurred that this weighting was consistent with their clinical assessment of each domain's relative importance.

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Not applicable

Appendix E1: Related and Competing Measures (tabular format)

Comparison of NQF # 3357 and NQF # 2687

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
Steward	Centers for Medicare & Medicaid Services (CMS)	The Centers for Medicare & Medicaid Services (CMS)
Description	Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission	Facility-level, post-surgical risk-standardized hospital visit ratio (RSHVR) of the predicted to expected number of all-cause, unplanned hospital visits within 7 days of a same-day surgery at a hospital outpatient department (HOPD) among Medicare fee-for-service (FFS) patients aged 65 years and older.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data	Claims, Enrollment Data
Level	Facility	Facility
Setting	Outpatient Services	Inpatient/Hospital
Numerator Statement	The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within 7 days of a general surgery procedure performed at an ASC.	The outcome is all-cause, unplanned hospital visits, defined as 1) an inpatient admission directly after the surgery or 2) an unplanned hospital visit (emergency department [ED] visit, observation stay, or unplanned inpatient admission) occurring after discharge and within 7 days of the surgical procedure.
Numerator Details	Outcome Definition The outcome is unplanned hospital visits, defined as an ED visit, observation stay, or unplanned inpatient admission, occurring within 7 days of the general surgery procedure performed at an ASC identified using Centers for Medicare & Medicaid Services (CMS) Medicare administrative claims data. Time Period for Data Numerator time window: 7 days after ASC procedures for unplanned hospital visits. Denominator time window: General surgery ASC procedures performed during the measurement period. Identification of Planned Admissions	Outcome Definition The outcome is all-cause, unplanned hospital visits, defined as 1) an inpatient admission directly after the surgery or 2) an unplanned hospital visit (ED visit, observation stay, or unplanned inpatient admission) occurring after discharge and within 7 days of the surgical procedure. If more than one unplanned hospital visit occurs in the 7 days following the surgical procedure, only the first hospital visit within the outcome timeframe is counted in the outcome. If there are two surgical procedures within a 7-day period, we adjust the follow up period of the first procedure to be the time between the first procedure and the second procedure. The second procedure's follow up period remains 7 days. Outcomes after the first procedure must fall in the new follow up period range, while outcomes in the 7 days following the second procedure are assigned to the second procedure.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
	The measure outcome includes hospital visits within the first 7 days following the procedure, unless that inpatient admission is deemed a "planned" admission. We applied CMS's Planned Readmission Algorithm Version 4.0 to identified planned admissions [1]. Planned admissions are defined as those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. CMS seeks to count only unplanned admissions in the measure outcome because variation in planned admissions does not reflect quality differences. The algorithm (see the flowchart in the Data Dictionary, first tab, "S.6 Planned Adm Alg Flowchart") identifies inpatient admissions that are typically planned and may occur after the patient's index general surgery procedure, considering a few specific, limited types of care as "planned"(e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses, or with diagnoses that might represent complications of a surgery, as "unplanned" and thus counts these inpatient admissions in the measure outcome. Details of the planned admission algorithm and codes to identify planned admissions are in the attached Data Dictionary sheet labeled "S.6 Planned Adm Alg." Definition of ED Visits and Observation Stay The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes used to define ED visits and observation stays are in the attached Data Dictionary sheet labeled "S.6 Numerator-ED Obs Def." Citations 1. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.	Identification of Planned Admissions The measure outcome includes any inpatient admission within the first 7 days after the surgery, unless that inpatient admission is deemed a "planned" admission. The measure considers inpatient admissions occurring on the day of the surgery (Day 0) and Day 1 post-surgery "unplanned" as the vast majority of these admissions are inpatient admissions directly following surgery and therefore likely represent complications of care, inpatient admissions primarily for non-clinical reasons (such as lack of transport home), and inpatient admissions for logistical issues (such as delayed start of surgery). For inpatient admissions occurring on Days 2-7 after surgery, the measure only counts unplanned admissions in the outcome. Planned admissions are those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. The Centers for Medicare & Medicaid Services (CMS) seeks to count only unplanned admissions in the measure outcome, because variation in planned admissions does not reflect quality differences. The measure identifies planned admissions using an algorithm that considers the inpatient admission's procedures and diagnoses and classifies the inpatient admission as planned or unplanned. We based the planned admission algorithm on the CMS Planned Readmission Algorithm Version 4.0, which CMS created for its hospital-wide readmission measure. In brief, the algorithm identifies inpatient admissions that are typically planned and may occur after the patient's index event. The algorithm always considers a few specific, limited types of care planned (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. For example, the algorithm considers hip replacement unplanned if hip fracture (an acute condition) is the discharge diagnosis, but planned if osteoarthritis (a non-acute condition) is the discharge diagnosis. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses or that

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
		might represent complications of a surgery unplanned and thus counts these inpatient admissions in the measure outcome. The Facility 7-day Risk-Standardized Hospital Visits after Hospital Outpatient Surgery Measure 2016 Measure Updates and Specifications Report (see data field S.1. for the link) contains the detailed algorithm used to identify planned admissions. Applying the algorithm to 2010 Medicare 20% FFS data, planned admissions constituted 2% of all hospital visits and 3% of all inpatient admissions within 7 days of outpatient surgery. Please see "Surgery Measure_Data Dictionary_Feb2017", sheet "ICD-9 PlannedAlgorithm," for the ICD-9 Planned Admission Algorithm and "ICD-10 PlannedAlgorithm," for the ICD-10 Planned Admission Algorithm. Definition of ED and Observation Stay The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes that define ED visits and observation stays are in the Data Dictionary, sheet "ED & Obs Stay Def."
Denominator Statement	Target Population Included patients: The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein. The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment. Included procedures:	Outpatient same-day surgeries performed at HOPDs for Medicare FFS patients aged 65 years and older.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
	The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training. To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes. Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure	

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
	includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B). Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities. See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.	
Denominator Details	Target Population Included patients: The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.	This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year). We therefore use this field to define the measure cohort. Target Population The target population is Medicare FFS patients aged 65 years and older undergoing same-day surgery (those that do not typically require an overnight stay) at HOPDs. We limit the measure cohort to older

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
	The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment. Included procedures: The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training. To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.	Medicare FFS patients because national data linking patient risk factors, procedures, and outcomes across care settings is only available for this group. We further limit the measure to patients who have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of surgery to ensure we have adequate data for identifying comorbidities for risk adjustment. The measure includes surgeries if a claim is present in the Medicare outpatient data indicating an HOPD same-day surgery. Specifically, we identify physician claims as Outpatient Hospital Department/or Physician Office by the Line Place of Service Code in the Part B Carrier Standard Analytical File (SAF). We then link these claims to Outpatient SAF claims to identify the HOPD where the surgery took place. If there is no match in the Outpatient SAF claims, we link the claim to the inpatient facility claims (contained in the Medicare Provider Analysis and Review [MedPAR] file) if there is a claim that falls within 3 days of the initial physician claim. Claims that are linked to inpatient files are deemed to fall under the 3-day payment window (see description below). Surgeries for which an outpatient claim is not filed are not included in the measure cohort. "Same-day surgeries" are substantive surgeries and procedures listed on Medicare's list of covered ambulatory surgical center (ASC) procedures for 2014, 2015, or 2016 (with the exception of eye surgeries). Medicare developed this list for ASCs to identify surgeries that can be safely-performed as same-day surgeries and do not typically require an overnight stay. This list of surgeries is publicly available at: http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ASCPayment/ASC-Regulations-and-Notices-Items/CMS-1589-FC.html (refer to Addendum AA on the website). Surgeries on the ASC list of covered procedures do not involve or require major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. Although Medicare developed this list of surgeries for ASCs, we use it for this HOPD measure for two reasons. First, it aligns with our target cohort of surgeries that have a low to moderate risk profile and are safe to be performed as same-day surgeries. By only including surgeries on this list in the measure, the measure effectively does not

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
	Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B). Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities. See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.	include surgeries performed at HOPDs that typically require an overnight stay which are more complex, higher risk surgeries. Second, we use this list of surgeries for practical considerations. The ASC list is publicly available, is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of same-day surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT) codes. Ambulatory surgeries include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. We want to include substantive surgeries but not very low risk (minor) surgeries or non-surgical procedures which typically have a high volume and a very low outcome rate. We identify substantive surgeries using the global surgery indicator (GSI) value 090, which identifies surgeries of greater complexity and follow-up care based on Work Relative Value Units (RVUs). The measure does not include minor non-surgical procedures (GSI code 000) or minor surgeries (GSI code 010), with one exception: the measure includes cystoscopy with intervention because this is a common procedure, often performed for therapeutic intervention by surgical teams, and has an outcome rate similar to other surgeries in the measure cohort. Please see Data Dictionary, sheet "Cystoscopies in Cohort," for list of cystoscopy codes included in the cohort. The measure cohort does not include eye surgeries. Although eye surgery is considered a substantive (GSI 090) surgery, its risk profile is more representative of "minor" surgery, in that it is characterized by high volume and a low outcome ratio. Please see Data Dictionary, sheet "Eye Surgeries Not in Cohort," for list of eye surgery codes not included in the cohort. Please see Data Dictionary, sheet "Measure Cohort," for surgery codes that define the measure cohort.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
		Finally, when multiple surgeries occur concurrently, the measure only includes surgeries that are performed concurrently with another low to moderate risk procedure listed on Medicare's list of covered ASC procedures. The measure does not include same-day surgeries occurring concurrently with a higher risk procedure such as an inpatient-only surgery. Please see Data Dictionary, sheet "High risk procedures" for a list of codes. These procedures were identified by the following process: (1) From the Hospital Outpatient Prospective Payment System (OPPS) rule, identify the set of procedures reimbursable using Addendum B with status indicators 'C' (inpatient only procedures), 'S' (significant procedures, not discounted when multiple), 'T' (significant procedure, multiple reduction applies), and 'Qx' (packaged services subject to separate payment based on OPPS criteria); (2) from this selection of procedures, select those not included in the ASC covered procedure list; (3) using the global surgical package from the Physician Fee Schedule, select procedures with GSI value '010' or '090.' We are left with OPPS/Hospital Inpatient Prospective Payment System (IPPS) major and minor procedures not included in the ASC covered procedures list. Addendum B can be found here: https://www.cms.gov/apps/ama/license.asp?file=/Medicare/Medicare-Fee-for-Service-Payment/HospitalOutpatientPPS/Downloads/CMS-1656-FC-2017-OPPS-FR-Data-Addendum-B-and-2-Times-Rule-File.zip. Capture of Surgeries Affected by the Medicare 3-Day Payment Window Policy: The Medicare 3-day payment window policy affects some surgeries performed at HOPDs. The policy deems outpatient services (including surgeries) provided by a hospital or any Part B entity wholly owned or operated by a hospital (such as an HOPD) in the three calendar days preceding the date of a beneficiary's inpatient admission as related to the admission [1]. For outpatient surgeries affected, the HOPD facility claim (for the technical portion of the surgery) is bundled with the inpatient claim and is not recorded in the Medicare Outpatient SAF; the Medicare Physician claim for professional services rendered is still submitted separately.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
		To ensure the capture of HOPD surgeries affected by the policy, the measure identifies in the Medicare Carrier SAF physician claims for surgery performed in the HOPD setting and matches these to an inpatient admission within three days and lacking a corresponding HOPD facility claim. The measure then attributes the surgery identified as affected by this policy to the appropriate HOPD using the facility provider ID from the inpatient claim. Citations 1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html.
Exclusions	The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.	The measure excludes surgeries for patients without continuous enrollment in Medicare FFS Parts A and B in the 7 days after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment. The exclusion prevents unfair distortion of performance results. Additionally, the measure excludes surgeries for patients who had an ED visit on the same day, but the ED visit was billed on a different claim, unless the ED visit has a diagnosis indicative of a complication of care.
Exclusion Details	Lack of 7 or more days of continuous enrollment in Medicare FFS after the ASC surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file (unless lack of enrollment was due to death). The procedure must be 7 or more days from the end of the month or the enrollment indicators must be appropriately marked for the month that falls within 7 days of the procedure date (unless disenrollment is due to death), otherwise the procedure is excluded.	Lack of continuous enrollment in Medicare FFS for 7 days after the outpatient same-day surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file. The enrollment indicators must be appropriately marked for the month(s) which fall within 7 days of surgery date. The measure excludes surgeries in which a patient had an ED visit on the same day, but the ED visit was billed on a different claim; however, the measure does not exclude surgeries with same-day, separate-claim ED visits when the diagnosis for the ED visit is indicative of a post-surgery complication. The measure classifies these diagnoses using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS) groups. The measure considers ED visits with the following diagnoses as outcomes: AHRQ CCS 237 – Complication of device; implant or graft AHRQ CCS 238 – Complications of surgical procedures or medical care

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		AHRQ CCS 257 – Other aftercare ICD-9-CM code 338.18 – Acute pain In these scenarios, the procedure is counted in the index cohort and the ED visit is counted as an outcome.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	Not applicable.	Not applicable.
Type Score	Ratio	Ratio
Algorithm	The measure uses a two-level hierarchical logistic regression model to estimate ASC-level risk-standardized hospital visit ratios (RSHVRs). This approach accounts for the clustering of patients within ASCs and variation in sample size across ASCs. The RSHVR is calculated as the ratio of the predicted to the expected number of post-surgical unplanned hospital visits among ASC's patients. For each ASC, the numerator of the ratio is the number of hospital visits predicted for the ASC's patients, accounting for its observed rate, the number and complexity of general surgery procedures performed at the ASC, and the case mix. The denominator is the number of hospital visits expected nationally for the ASC's case/procedure mix. To calculate an ASC's predicted-to-expected (P/E) ratio, the measure uses a two-level hierarchical logistic regression model. The log-odds of the outcome for an index procedure is modeled as a function of the patient demographic, comorbidity, procedure characteristics, and a random ASC-specific intercept. A ratio greater than one indicates that the ASC's patients have more visits than expected, compared to an average ASC with similar patient and procedural complexity. A ratio less than one indicates that the ASC's patients have fewer post-surgical visits than expected, compared to an average ASC with similar patient and procedural complexity. This approach is analogous to an observed-to-expected ratio, but accounts for within-facility correlation of the observed outcome and sample size differences and accommodates the assumption that underlying differences in quality across ASCs lead to systematic differences in outcomes, and is tailored to and appropriate	1. Identify surgeries meeting the inclusion criteria described above in S.7. 2. Exclude procedures meeting any of the exclusion criteria described above in S.9. 3. Identify a binary flag for an unplanned hospital visit within 7 days of index procedures as described above in S.5. 4. Use patients' historical and index procedure claims data to create risk-adjustment variables. 5. Fit a hierarchical generalized linear model (HGLM) to produce a ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case mix. - The HGLM is adjusted for clinical risk factors that vary across patient populations, are unrelated to quality, and influence the outcome. Details about the risk-adjustment model are above in S.11. 6. Use statistical bootstrapping to construct a 95% confidence interval estimate for each facility's RSHVR. For more information about the measure methodology, please see the Facility 7-day Risk- Hospital Visits after Hospital Outpatient Surgery Measure Technical Report posted on the web page provided in data field S.1.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2687 Hospital Visits after Hospital Outpatient Surgery
	for a publicly reported outcome measure as articulated in published scientific guidelines [1-3]. Please see Appendix D of the attached technical report for details. Citations 1. Normand S-LT, Shahian DM. Statistical and clinical aspects of hospital outcomes profiling. Statistical Science. 2007;22(2):206-226. 2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for Statistical Models Used for Public Reporting of Health Outcomes An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation. 2006;113(3):456-462. 3. National Quality Forum. Measure Evaluation Criteria and Guidance for Evaluating Measures for Endorsement. 2015; http://www.qualityforum.org/Measuring_Performance/Submitting_Standards/2015_Measure_Evaluation_Criteria.aspx. Accessed July 26, 2016	
Submission items	5.1 Identified measures: 2539 : Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2687 : Hospital Visits after Hospital Outpatient Surgery 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. The measures' outcomes are harmonized. 5b.1 If competing, why superior or rationale for additive value: Not applicable. There are no competing measures.	5.1 Identified measures: 2539 : Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. 5b.1 If competing, why superior or rationale for additive value: Not applicable.

Comparison of NQF #3357 and NQF #2539

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
Steward	Centers for Medicare & Medicaid Services (CMS)	Centers for Medicare & Medicaid Services (CMS)
Description	Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission	Rate of risk-standardized, all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy among Medicare fee-for-service (FFS) patients aged 65 years and older.
Type	Outcome	Outcome
Data Source	Claims, Enrollment Data	Claims, Enrollment Data
Level	Facility	Facility
Setting	Outpatient Services	Hospital : Acute Care Facility, Outpatient Services
Numerator Statement	The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within 7 days of a general surgery procedure performed at an ASC.	The outcome for this measure is all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy. We define a hospital visit as any emergency department (ED) visit, observation stay, or unplanned inpatient admission.
Numerator Details	Outcome Definition The outcome is unplanned hospital visits, defined as an ED visit, observation stay, or unplanned inpatient admission, occurring within 7 days of the general surgery procedure performed at an ASC identified using Centers for Medicare & Medicaid Services (CMS) Medicare administrative claims data. Time Period for Data Numerator time window: 7 days after ASC procedures for unplanned hospital visits. Denominator time window: General surgery ASC procedures performed during the measurement period. Identification of Planned Admissions The measure outcome includes hospital visits within the first 7 days following the procedure, unless that inpatient admission is deemed a “planned” admission. We applied CMS’s Planned Readmission Algorithm Version 4.0 to identified planned	Outcome Definition The outcome for this measure is all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy. Hospital visits include ED visits, observation stays, and unplanned inpatient admissions. If more than one unplanned hospital visit occurs, only the first hospital visit within the outcome timeframe is counted in the outcome. Identification of Planned Admissions The measure outcome includes any inpatient admission within the first 7 days after the colonoscopy, unless that admission is deemed a “planned” admission as defined by the measure’s planned admission algorithm. The Centers for Medicare & Medicaid Services (CMS) seeks to count only unplanned admissions in the measure outcome, because variation in “planned” admissions does not reflect quality differences. We based the planned admission algorithm on the CMS Planned Readmission Algorithm Version 4.0, which CMS created for its hospital-wide readmission measure. In brief, the algorithm identifies admissions that are typically planned and may occur after

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	admissions [1]. Planned admissions are defined as those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. CMS seeks to count only unplanned admissions in the measure outcome because variation in planned admissions does not reflect quality differences. The algorithm (see the flowchart in the Data Dictionary, first tab, "S.6 Planned Adm Alg Flowchart") identifies inpatient admissions that are typically planned and may occur after the patient's index general surgery procedure, considering a few specific, limited types of care as "planned"(e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses, or with diagnoses that might represent complications of a surgery, as "unplanned" and thus counts these inpatient admissions in the measure outcome. Details of the planned admission algorithm and codes to identify planned admissions are in the attached Data Dictionary sheet labeled "S.6 Planned Adm Alg." Definition of ED Visits and Observation Stay The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes used to define ED visits and observation stays are in the attached Data Dictionary sheet labeled "S.6 Numerator-ED Obs Def." Citations 1. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.	the patient's index event. The algorithm always considers a few specific, limited types of care planned (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers admissions for acute illness or for complications of care planned. For example, the algorithm considers hip replacement unplanned if hip fracture (an acute condition) is the discharge diagnosis, but planned if osteoarthritis (a non-acute condition) is the discharge diagnosis. The algorithm considers admissions that include potentially planned procedures with acute diagnoses or that might represent complications of a colonoscopy unplanned and thus counts these admissions in the measure outcome. For more information about the Planned Admission Algorithm, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure 2016 Measure Updates and Specifications Report posted on the web page provided in data field S.1. Also see sheets 'Numerator- Table PA1' – 'Numerator-Table PA4' in the attached Data Dictionary for how the measure defines 'always planned procedures' (PA1), 'always planned diagnoses' (PA2), 'potentially planned procedures' (PA3), and 'acute' diagnoses (PA4). Definition of ED and Observation Stay We defined ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes that define ED visits and observation stays are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def."

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
Denominator Statement	Target Population Included patients: The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein. The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment. Included procedures: The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training. To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and	Colonoscopies performed at hospital outpatient departments (HOPDs) and ambulatory surgical centers (ASCs) for Medicare FFS patients aged 65 years and older.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes. Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B). Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP)	

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities. See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort. **Exclusions**: The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.	
Denominator Details	Target Population Included patients: The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein. The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment. Included procedures:	Target Population The measure includes colonoscopies performed at HOPDs and ASCs. The measure calculation package calculates a facility-level score for all eligible facilities separately for HOPDs and ASCs. The target population is patients aged 65 years and older who are generally well and have a colonoscopy to screen for colorectal cancer, biopsy or remove pre-cancerous lesions, or evaluate non-emergent symptoms and signs of disease. We limited the measure cohort to patients who are 65 and older, enrolled in Medicare FFS, and have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of procedure since national data linking risk factors, procedures, and outcomes across care settings are only available for this group. Eligible colonoscopies were identified using specified Current Procedural Terminology (CPT)/Healthcare Common Procedure Coding System (HCPCS) procedure codes in the Medicare Carrier

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training. To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes. Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically	(Part B Physician) Standard Analytical File (SAF). The CPT and HCPCS procedure codes that define the cohort are in the attached Data Dictionary, sheet "S.9 Denominator Details-Cohort." We considered all colonoscopy codes during development of the measure cohort. We did not include in the measure colonoscopy CPT procedure codes that reflected fundamentally higher-risk or different procedures. Those procedures billed with a qualifying colonoscopy procedure code and a high-risk colonoscopy procedure code (see attached Data Dictionary, sheet "S.9 Denominator Details-Hgh Rsk") were not included in the measure. Colonoscopy is not possible among patients who have had a prior total colectomy. Any claim for a colonoscopy in a patient with a prior total colectomy is therefore likely to be a coding error. We perform an error check to ensure the measure does not include these patients with a total colectomy recorded in their prior medical history. The CPT and HCPCS procedure codes and International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and ICD-10-CM codes that define the total colectomy data reliability check are in the attached Data Dictionary, sheet "S.9 Denominator Details-Colect." Capture of Colonoscopies Affected by the Medicare 3-Day Payment Window Policy: Colonoscopies performed at HOPDs can be affected by the Medicare 3-day payment window policy. The policy states that outpatient services (including all diagnostic services such as colonoscopy) provided by a hospital or any Part B entity wholly owned or wholly operated by a hospital (such as an HOPD) in the 3 calendar days preceding the date of a beneficiary's inpatient admission are deemed to be related to the admission [1]. For outpatient colonoscopies affected, the facility claim (for the technical portion of the colonoscopy) is bundled with the inpatient claim, although the Medicare Part B physician claim for professional services rendered is still submitted. This policy has implications for the measure because it may lead to: (1) failure to completely capture outpatient

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B). Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities. See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.	colonoscopies performed at HOPDs; and (2) underreporting of outcomes for colonoscopies performed in the HOPD setting. To ensure the capture of HOPD colonoscopies, we identify physician claims for colonoscopy in the HOPD setting from Medicare Part B claims, which had an inpatient admission within 3 days and lacked a corresponding HOPD facility claim. We then attribute the colonoscopies identified as affected by this policy to the appropriate HOPD facility using the facility provider ID from the inpatient claim. Citations 1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html
Exclusions	The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B	We established the following exclusion criteria after reviewing the literature, examining existing measures, discussing alternatives with the working group and technical expert panel (TEP) members, and reviewing feedback from the national dry run held in July 2015. The

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.	goal was to be as inclusive as possible; we excluded only those high-risk procedures and patient groups for which risk adjustment would not be adequate or for which hospital visits were not typically a quality signal. The exclusions, based on clinical rationales, prevent unfair distortion of performance results. 1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the 7 days after the procedure. Rationale: We exclude these patients to ensure full data availability for outcome assessment. 2) Colonoscopies that occur concurrently with high-risk upper gastrointestinal (GI) endoscopy procedures. Rationale: Patients undergoing concurrent high-risk upper GI endoscopy procedures, such as upper GI endoscopy procedures for the control of bleeding or treatment of esophageal varices, are often unwell and have a higher risk profile than typical colonoscopy patients. Therefore, these patients have a disproportionally higher risk for the outcome. 3) Colonoscopies for patients with a history of inflammatory bowel disease (IBD) or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim. Rationale: We exclude these patients because: -IBD is a chronic condition; patients with IBD undergo colonoscopy both for surveillance due to increased cancer risk and for evaluation of acute symptoms. IBD is likely to be coded as the primary diagnosis prompting the procedure irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure in the setting of an acute exacerbation of IBD. Therefore, we may not be able to adequately risk adjust for these patients as we cannot identify relatively well versus acutely unwell patients among visits coded as IBD. -Our aim is to capture hospital visits which reflect the quality of care. Admissions for acutely ill IBD patients who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of an IBD flare do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
		Sample (see the 2014 Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted at https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier3&cid=1228775197506) for full description of the dataset), more than one-third of IBD patients admitted to the hospital with colonoscopy had a discharge diagnosis of IBD, indicating their admission was for medical treatment of their IBD. We therefore excluded this group so that providers who treat a disproportionate number of IBD patients will not be disadvantaged in the measure. -A post-index diagnosis of IBD, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded. 4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim. Rationale: We exclude these patients because: -It is unclear what the health status is of patients coded with a history or current diagnosis of diverticulitis, making it difficult to fully risk adjust for patients' health. Colonoscopies performed on patients with a history or current diagnosis of diverticulitis are likely to be coded as diverticulitis as the primary diagnosis irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure (i.e., are acutely unwell with active disease). Furthermore, the codes for diverticulitis and diverticulosis may not be consistently used; patients with diverticulosis may be erroneously coded as diverticulitis. Therefore, we may not be able to adequately risk adjust as we cannot identify relatively well versus acutely unwell patients among visits coded as diverticulitis. -Admissions for acutely ill patients with a history or current diagnosis of diverticulitis who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
		Full Development Sample (see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted on the web page provided in data field S.1) more than one-quarter of patients with a history or current diagnosis of diverticulitis admitted to the hospital post colonoscopy had a discharge diagnosis of diverticulitis, indicating they were admitted for medical treatment of the condition. These admissions are likely unrelated to the quality of the colonoscopy. We therefore excluded this group so that providers who treat a disproportionate number of diverticulitis patients will not be disadvantaged in the measure. -A post-index diagnosis of diverticulitis, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded. 5) Colonoscopies that occur on the same hospital outpatient claim as an ED visit (applies to colonoscopies at HOPDs only). Rationale: We exclude these patients because: -The sequence of events in these cases is not clear. It is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the ED visit. 6) Colonoscopies that occur on the same day and at the same hospital as an ED visit that is billed on a separate claim than the index colonoscopy (applies to colonoscopies at HOPDs only) Rationale: We exclude these patients because: -It is unclear whether the same-day ED visit occurred before or after the colonoscopy. However, for ED visits billed on the same day but at a different facility, it is unlikely that a patient would experience an ED visit for an acute diagnosis at one facility and then travel to another facility for a routine colonoscopy on the same day. Therefore, these colonoscopies are not excluded because they likely represent a routine procedure followed by a complication of care. 7) Colonoscopies that occur on the same hospital outpatient claim as an observation stay (applies to colonoscopies at HOPDs only). Rationale: We exclude these patients because:

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
		-The sequence of events in these cases is not clear. It is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the observation stay. 8) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within 7 days. Rationale: We exclude these patients because: -The two colonoscopies are considered part of a single episode of care, for which the subsequent colonoscopy is considered the index procedure.
Exclusion Details	Lack of 7 or more days of continuous enrollment in Medicare FFS after the ASC surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file (unless lack of enrollment was due to death). The procedure must be 7 or more days from the end of the month or the enrollment indicators must be appropriately marked for the month that falls within 7 days of the procedure date (unless disenrollment is due to death), otherwise the procedure is excluded.	1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the 7 days after the procedure. Lack of continuous enrollment in Medicare FFS for 7 days after the procedure is determined by patient enrollment status in FFS Parts A and B using the Medicare Enrollment Database. The enrollment indicators must be appropriately marked for the month(s) which fall within 7 days of the procedure date. 2) Colonoscopies that occur concurrently with high-risk upper GI endoscopy procedures. The list of the CPT codes for the upper GI endoscopy procedures identified as “high-risk” are in attached Data Dictionary, sheet “S.11 Denom. Exclusion Upper En.” 3) Colonoscopies for patients with a history of IBD or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim. The ICD-9-CM and ICD-10-CM codes that define IBD are in the attached Data Dictionary, sheet “S.11 Denom. Exclusion IBD.” 4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim. The ICD-9-CM and ICD-10-CM codes that define diverticulitis are in the attached Data Dictionary, sheet “S.11 Denom. Exclusion Divertic.” 5) Colonoscopies that occur on the same hospital outpatient claim as an ED visit.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
		The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def." (Applies to colonoscopies at HOPDs only) 6) Colonoscopies that occur on the same day and at the same hospital as an ED visit that is billed on a separate claim than the index colonoscopy. The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def." The same facility is defined as having the same CMS Certification Number (CCN). (Applies to colonoscopies at HOPDs only) 7) Colonoscopies that occur on the same hospital outpatient claim as an observation stay. The billing and revenue center codes that define observation stays are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def." (Applies to colonoscopies at HOPDs only) 8) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within 7 days. For cases in which a colonoscopy is followed by another colonoscopy within 7 days, the measure will use the subsequent colonoscopy as the index colonoscopy.
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	Not applicable.	Not applicable
Type Score	Ratio	Rate/proportion
Algorithm	The measure uses a two-level hierarchical logistic regression model to estimate ASC-level risk-standardized hospital visit ratios (RSHVRs). This approach accounts for the clustering of patients within ASCs and variation in sample size across ASCs. The RSHVR is calculated as the ratio of the predicted to the expected number of post-surgical unplanned hospital visits among ASC's patients. For each ASC, the numerator of the ratio is the number of hospital visits predicted for the ASC's patients, accounting for its observed rate, the number and complexity of general surgery procedures performed at the ASC, and the case mix. The denominator is the number of hospital visits expected nationally	The measure is calculated separately for HOPDs and ASCs. 1. Identify colonoscopies meeting the inclusion criteria described above in S.9. 2. Exclude procedures meeting any of the exclusion criteria described above in S.11. 3. Identify and create a binary (0/1) flag for an unplanned hospital visit within 7 days of the colonoscopy described above in Section S.5. 4. Use patients' historical and index procedure claims data to create risk adjustment variables.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	for the ASC's case/procedure mix. To calculate an ASC's predicted-to-expected (P/E) ratio, the measure uses a two-level hierarchical logistic regression model. The log-odds of the outcome for an index procedure is modeled as a function of the patient demographic, comorbidity, procedure characteristics, and a random ASC-specific intercept. A ratio greater than one indicates that the ASC's patients have more visits than expected, compared to an average ASC with similar patient and procedural complexity. A ratio less than one indicates that the ASC's patients have fewer post-surgical visits than expected, compared to an average ASC with similar patient and procedural complexity. This approach is analogous to an observed-to-expected ratio, but accounts for within-facility correlation of the observed outcome and sample size differences and accommodates the assumption that underlying differences in quality across ASCs lead to systematic differences in outcomes, and is tailored to and appropriate for a publicly reported outcome measure as articulated in published scientific guidelines [1-3]. Please see Appendix D of the attached technical report for details. Citations 1. Normand S-LT, Shahian DM. Statistical and clinical aspects of hospital outcomes profiling. Statistical Science. 2007;22(2):206-226. 2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for Statistical Models Used for Public Reporting of Health Outcomes An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation. 2006;113(3):456-462. 3. National Quality Forum. Measure Evaluation Criteria and Guidance for Evaluating Measures for Endorsement. 2015; http://www.qualityforum.org/Measuring_Performance/Submitti	5. Fit a hierarchical generalized linear model (HGLM) to produce a ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case mix. - The HGLM is adjusted for clinical risk factors that vary across patient populations, are unrelated to quality, and influence the outcome. Details about the risk-adjustment model are above in S.14. 6. Multiply the ratio estimated in step 3 by the observed national 7-day hospital visit rate to obtain a risk-standardized hospital visit (RSHV) rate for each facility. 7. Use bootstrapping to construct a 95% confidence interval estimate for each facility's RSHV rate. For more information about the measure methodology, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2016 Measure Updates and Specifications Report posted on the web page provided in data field S.1.

	3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)	2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy
	ng_Standards/2015_Measure_Evaluation_Criteria.aspx. Accessed July 26, 2016.	
Submission items	5.1 Identified measures: 2539 : Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2687 : Hospital Visits after Hospital Outpatient Surgery 5a.1 Are specs completely harmonized? Yes 5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. The measures' outcomes are harmonized. 5b.1 If competing, why superior or rationale for additive value: Not applicable. There are no competing measures.	5.1 Identified measures: 5a.1 Are specs completely harmonized? 5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. 5b.1 If competing, why superior or rationale for additive value: One NQF-endorsed measure has a different focus and outcome but shares some similarities with our measure, so we mention it here for completeness: NQF #0265: ASC Hospital Transfer/Admission Measure (ASC Quality Collaboration). The measure focus is all procedures and surgeries at ASCs (including colonoscopies). Therefore, the cohort has limited overlap with the cohort of our measure; it includes a much broader range of surgeries and procedures at ASCs, and does not cover outpatient colonoscopies performed at HOPDs. Its outcome is same-day transfer for admission, which accounts for a very small subset of the hospital visits assessed in our measure.

Appendix E2: Related and Competing Measures (narrative format)

Comparison of NQF # 3357 and NQF # 2687

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)
2687 Hospital Visits after Hospital Outpatient Surgery

Steward

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Centers for Medicare & Medicaid Services (CMS)

2687 Hospital Visits after Hospital Outpatient Surgery

The Centers for Medicare & Medicaid Services (CMS)

Description

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission

2687 Hospital Visits after Hospital Outpatient Surgery

Facility-level, post-surgical risk-standardized hospital visit ratio (RSHVR) of the predicted to expected number of all-cause, unplanned hospital visits within 7 days of a same-day surgery at a hospital outpatient department (HOPD) among Medicare fee-for-service (FFS) patients aged 65 years and older.

Type

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Outcome

2687 Hospital Visits after Hospital Outpatient Surgery

Outcome

Data Source

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Claims, Enrollment Data

2687 Hospital Visits after Hospital Outpatient Surgery

Claims, Enrollment Data

Level

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Facility

2687 Hospital Visits after Hospital Outpatient Surgery

Facility

Setting

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Outpatient Services

2687 Hospital Visits after Hospital Outpatient Surgery

Inpatient/Hospital

Numerator Statement

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within 7 days of a general surgery procedure performed at an ASC.

2687 Hospital Visits after Hospital Outpatient Surgery

The outcome is all-cause, unplanned hospital visits, defined as 1) an inpatient admission directly after the surgery or 2) an unplanned hospital visit (emergency department [ED] visit, observation stay, or unplanned inpatient admission) occurring after discharge and within 7 days of the surgical procedure.

Numerator Details

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Outcome Definition

The outcome is unplanned hospital visits, defined as an ED visit, observation stay, or unplanned inpatient admission, occurring within 7 days of the general surgery procedure performed at an ASC identified using Centers for Medicare & Medicaid Services (CMS) Medicare administrative claims data.

Time Period for Data

Numerator time window: 7 days after ASC procedures for unplanned hospital visits.

Denominator time window: General surgery ASC procedures performed during the measurement period.

Identification of Planned Admissions

The measure outcome includes hospital visits within the first 7 days following the procedure, unless that inpatient admission is deemed a “planned” admission. We applied CMS’s Planned Readmission Algorithm Version 4.0 to identified planned admissions [1]. Planned admissions are defined as those planned by providers for anticipated medical

treatment or procedures that must be provided in the inpatient setting. CMS seeks to count only unplanned admissions in the measure outcome because variation in planned admissions does not reflect quality differences. The algorithm (see the flowchart in the Data Dictionary, first tab, "S.6 Planned Adm Alg Flowchart") identifies inpatient admissions that are typically planned and may occur after the patient's index general surgery procedure, considering a few specific, limited types of care as "planned"(e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses, or with diagnoses that might represent complications of a surgery, as "unplanned" and thus counts these inpatient admissions in the measure outcome.

Details of the planned admission algorithm and codes to identify planned admissions are in the attached Data Dictionary sheet labeled "S.6 Planned Adm Alg."

Definition of ED Visits and Observation Stay

The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims.

The codes used to define ED visits and observation stays are in the attached Data Dictionary sheet labeled "S.6 Numerator-ED Obs Def."

Citations

1. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.

2687 Hospital Visits after Hospital Outpatient Surgery

Outcome Definition

The outcome is all-cause, unplanned hospital visits, defined as 1) an inpatient admission directly after the surgery or 2) an unplanned hospital visit (ED visit, observation stay, or unplanned inpatient admission) occurring after discharge and within 7 days of the surgical procedure. If more than one unplanned hospital visit occurs in the 7 days following the surgical procedure, only the first hospital visit within the outcome timeframe is counted in the outcome. If there are two surgical procedures within a 7-day period, we adjust the follow up period of the first procedure to be the time between the first procedure and the second procedure. The second procedure's follow up period remains 7 days. Outcomes after the first procedure must fall in the new follow up period range, while outcomes in the 7 days following the second procedure are assigned to the second procedure.

Identification of Planned Admissions

The measure outcome includes any inpatient admission within the first 7 days after the surgery, unless that inpatient admission is deemed a "planned" admission. The measure considers inpatient admissions occurring on the day of the surgery (Day 0) and Day 1 post-surgery "unplanned" as the vast majority of these admissions are inpatient admissions directly following surgery and therefore likely represent complications of care, inpatient admissions primarily for non-clinical reasons (such as lack of transport home), and inpatient admissions for logistical issues (such as delayed start of surgery). For inpatient admissions occurring on Days 2-7 after surgery, the measure only counts unplanned

admissions in the outcome. Planned admissions are those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. The Centers for Medicare & Medicaid Services (CMS) seeks to count only unplanned admissions in the measure outcome, because variation in planned admissions does not reflect quality differences. The measure identifies planned admissions using an algorithm that considers the inpatient admission's procedures and diagnoses and classifies the inpatient admission as planned or unplanned. We based the planned admission algorithm on the CMS Planned Readmission Algorithm Version 4.0, which CMS created for its hospital-wide readmission measure. In brief, the algorithm identifies inpatient admissions that are typically planned and may occur after the patient's index event. The algorithm always considers a few specific, limited types of care planned (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. For example, the algorithm considers hip replacement unplanned if hip fracture (an acute condition) is the discharge diagnosis, but planned if osteoarthritis (a non-acute condition) is the discharge diagnosis. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses or that might represent complications of a surgery unplanned and thus counts these inpatient admissions in the measure outcome.

The Facility 7-day Risk-Standardized Hospital Visits after Hospital Outpatient Surgery Measure 2016 Measure Updates and Specifications Report (see data field S.1. for the link) contains the detailed algorithm used to identify planned admissions. Applying the algorithm to 2010 Medicare 20% FFS data, planned admissions constituted 2% of all hospital visits and 3% of all inpatient admissions within 7 days of outpatient surgery.

Please see "Surgery Measure_Data Dictionary_Feb2017", sheet "ICD-9 PlannedAlgorithm," for the ICD-9 Planned Admission Algorithm and "ICD-10 PlannedAlgorithm," for the ICD-10 Planned Admission Algorithm.

Definition of ED and Observation Stay

The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes that define ED visits and observation stays are in the Data Dictionary, sheet "ED & Obs Stay Def."

Denominator Statement

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We

limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We

did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

2687 Hospital Visits after Hospital Outpatient Surgery

Outpatient same-day surgeries performed at HOPDs for Medicare FFS patients aged 65 years and older.

Denominator Details

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list

of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

2687 Hospital Visits after Hospital Outpatient Surgery

This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year). We therefore use this field to define the measure cohort.

Target Population

The target population is Medicare FFS patients aged 65 years and older undergoing same-day surgery (those that do not typically require an overnight stay) at HOPDs. We limit the measure cohort to older Medicare FFS patients because national data linking patient risk factors, procedures, and outcomes across care settings is only available for this group. We further limit the measure to patients who have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of surgery to ensure we have adequate data for identifying comorbidities for risk adjustment.

The measure includes surgeries if a claim is present in the Medicare outpatient data indicating an HOPD same-day surgery. Specifically, we identify physician claims as Outpatient Hospital Department/or Physician Office by the Line Place of Service Code in the Part B Carrier Standard Analytical File (SAF). We then link these claims to Outpatient SAF claims to identify the HOPD where the surgery took place. If there is no match in the

Outpatient SAF claims, we link the claim to the inpatient facility claims (contained in the Medicare Provider Analysis and Review [MedPAR] file) if there is a claim that falls within 3 days of the initial physician claim. Claims that are linked to inpatient files are deemed to fall under the 3-day payment window (see description below). Surgeries for which an outpatient claim is not filed are not included in the measure cohort.

"Same-day surgeries" are substantive surgeries and procedures listed on Medicare's list of covered ambulatory surgical center (ASC) procedures for 2014, 2015, or 2016 (with the exception of eye surgeries). Medicare developed this list for ASCs to identify surgeries that can be safely-performed as same-day surgeries and do not typically require an overnight stay. This list of surgeries is publicly available at: http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ASCPayment/ASC-Regulations-and-Notices-Items/CMS-1589-FC.html (refer to Addendum AA on the website). Surgeries on the ASC list of covered procedures do not involve or require major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening.

Although Medicare developed this list of surgeries for ASCs, we use it for this HOPD measure for two reasons. First, it aligns with our target cohort of surgeries that have a low to moderate risk profile and are safe to be performed as same-day surgeries. By only including surgeries on this list in the measure, the measure effectively does not include surgeries performed at HOPDs that typically require an overnight stay which are more complex, higher risk surgeries. Second, we use this list of surgeries for practical considerations. The ASC list is publicly available, is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of same-day surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT) codes.

Ambulatory surgeries include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. We want to include substantive surgeries but not very low risk (minor) surgeries or non-surgical procedures which typically have a high volume and a very low outcome rate. We identify substantive surgeries using the global surgery indicator (GSI) value 090, which identifies surgeries of greater complexity and follow-up care based on Work Relative Value Units (RVUs). The measure does not include minor non-surgical procedures (GSI code 000) or minor surgeries (GSI code 010), with one exception: the measure includes cystoscopy with intervention because this is a common procedure, often performed for therapeutic intervention by surgical teams, and has an outcome rate similar to other surgeries in the measure cohort. Please see Data Dictionary, sheet "Cystoscopies in Cohort," for list of cystoscopy codes included in the cohort.

The measure cohort does not include eye surgeries. Although eye surgery is considered a substantive (GSI 090) surgery, its risk profile is more representative of "minor" surgery, in that it is characterized by high volume and a low outcome ratio. Please see Data Dictionary, sheet "Eye Surgeries Not in Cohort," for list of eye surgery codes not included in the cohort.

Please see Data Dictionary, sheet "Measure Cohort," for surgery codes that define the measure cohort.

Finally, when multiple surgeries occur concurrently, the measure only includes surgeries that are performed concurrently with another low to moderate risk procedure listed on Medicare's list of covered ASC procedures. The measure does not include same-day surgeries occurring concurrently with a higher risk procedure such as an inpatient-only surgery. Please see Data Dictionary, sheet "High risk procedures" for a list of codes. These procedures were identified by the following process: (1) From the Hospital Outpatient Prospective Payment System (OPPS) rule, identify the set of procedures reimbursable using Addendum B with status indicators 'C' (inpatient only procedures), 'S' (significant procedures, not discounted when multiple), 'T' (significant procedure, multiple reduction applies), and 'Qx' (packaged services subject to separate payment based on OPPS criteria); (2) from this selection of procedures, select those not included in the ASC covered procedure list; (3) using the global surgical package from the Physician Fee Schedule, select procedures with GSI value '010' or '090.' We are left with OPPS/Hospital Inpatient Prospective Payment System (IPPS) major and minor procedures not included in the ASC covered procedures list. Addendum B can be found here: https://www.cms.gov/apps/ama/license.asp?file=/Medicare/Medicare-Fee-for-Service-Payment/HospitalOutpatientPPS/Downloads/CMS-1656-FC-2017-OPPS-FR-Data-Addendum-B-and-2-Times-Rule-File.zip.

Capture of Surgeries Affected by the Medicare 3-Day Payment Window Policy:

The Medicare 3-day payment window policy affects some surgeries performed at HOPDs. The policy deems outpatient services (including surgeries) provided by a hospital or any Part B entity wholly owned or operated by a hospital (such as an HOPD) in the three calendar days preceding the date of a beneficiary's inpatient admission as related to the admission [1]. For outpatient surgeries affected, the HOPD facility claim (for the technical portion of the surgery) is bundled with the inpatient claim and is not recorded in the Medicare Outpatient SAF; the Medicare Physician claim for professional services rendered is still submitted separately.

To ensure the capture of HOPD surgeries affected by the policy, the measure identifies in the Medicare Carrier SAF physician claims for surgery performed in the HOPD setting and matches these to an inpatient admission within three days and lacking a corresponding HOPD facility claim. The measure then attributes the surgery identified as affected by this policy to the appropriate HOPD using the facility provider ID from the inpatient claim.

Citations

1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html.

Exclusions

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.

2687 Hospital Visits after Hospital Outpatient Surgery

The measure excludes surgeries for patients without continuous enrollment in Medicare FFS Parts A and B in the 7 days after the surgery. The measure excludes these patients to

ensure all patients have full data available for outcome assessment. The exclusion prevents unfair distortion of performance results. Additionally, the measure excludes surgeries for patients who had an ED visit on the same day, but the ED visit was billed on a different claim, unless the ED visit has a diagnosis indicative of a complication of care.

Exclusion Details

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Lack of 7 or more days of continuous enrollment in Medicare FFS after the ASC surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file (unless lack of enrollment was due to death). The procedure must be 7 or more days from the end of the month or the enrollment indicators must be appropriately marked for the month that falls within 7 days of the procedure date (unless disenrollment is due to death), otherwise the procedure is excluded.

2687 Hospital Visits after Hospital Outpatient Surgery

Lack of continuous enrollment in Medicare FFS for 7 days after the outpatient same-day surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file. The enrollment indicators must be appropriately marked for the month(s) which fall within 7 days of surgery date.

The measure excludes surgeries in which a patient had an ED visit on the same day, but the ED visit was billed on a different claim; however, the measure does not exclude surgeries with same-day, separate-claim ED visits when the diagnosis for the ED visit is indicative of a post-surgery complication. The measure classifies these diagnoses using the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS) groups. The measure considers ED visits with the following diagnoses as outcomes:

AHRQ CCS 237 – Complication of device; implant or graft

AHRQ CCS 238 – Complications of surgical procedures or medical care

AHRQ CCS 257 – Other aftercare

ICD-9-CM code 338.18 – Acute pain

In these scenarios, the procedure is counted in the index cohort and the ED visit is counted as an outcome.

Risk Adjustment

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Statistical risk model

2687 Hospital Visits after Hospital Outpatient Surgery

Statistical risk model

Stratification

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Not applicable.

2687 Hospital Visits after Hospital Outpatient Surgery

Not applicable.

Type Score

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Ratio

2687 Hospital Visits after Hospital Outpatient Surgery

Ratio

Algorithm

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

The measure uses a two-level hierarchical logistic regression model to estimate ASC-level risk-standardized hospital visit ratios (RSHVRs). This approach accounts for the clustering of patients within ASCs and variation in sample size across ASCs. The RSHVR is calculated as the ratio of the predicted to the expected number of post-surgical unplanned hospital visits among ASC's patients. For each ASC, the numerator of the ratio is the number of hospital visits predicted for the ASC's patients, accounting for its observed rate, the number and complexity of general surgery procedures performed at the ASC, and the case mix. The denominator is the number of hospital visits expected nationally for the ASC's case/procedure mix. To calculate an ASC's predicted-to-expected (P/E) ratio, the measure uses a two-level hierarchical logistic regression model. The log-odds of the outcome for an index procedure is modeled as a function of the patient demographic, comorbidity, procedure characteristics, and a random ASC-specific intercept. A ratio greater than one indicates that the ASC's patients have more visits than expected, compared to an average ASC with similar patient and procedural complexity. A ratio less than one indicates that the ASC's patients have fewer post-surgical visits than expected, compared to an average ASC with similar patient and procedural complexity. This approach is analogous to an observed-to-expected ratio, but accounts for within-facility correlation of the observed outcome and sample size differences and accommodates the assumption that underlying differences in quality across ASCs lead to systematic differences in outcomes, and is tailored to and appropriate for a publicly reported outcome measure as articulated in published scientific guidelines [1-3].

Please see Appendix D of the attached technical report for details.

Citations

1. Normand S-LT, Shahian DM. Statistical and clinical aspects of hospital outcomes profiling. Statistical Science. 2007;22(2):206-226.

2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for Statistical Models Used for Public Reporting of Health Outcomes An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation. 2006;113(3):456-462.

3. National Quality Forum. Measure Evaluation Criteria and Guidance for Evaluating Measures for Endorsement. 2015;

http://www.qualityforum.org/Measuring_Performance/Submitting_Standards/2015_Measure_Evaluation_Criteria.aspx. Accessed July 26, 2016

2687 Hospital Visits after Hospital Outpatient Surgery

1. Identify surgeries meeting the inclusion criteria described above in S.7.

2. Exclude procedures meeting any of the exclusion criteria described above in S.9.

3. Identify a binary flag for an unplanned hospital visit within 7 days of index procedures as described above in S.5.

4. Use patients' historical and index procedure claims data to create risk-adjustment variables.

5. Fit a hierarchical generalized linear model (HGLM) to produce a ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case mix.

- The HGLM is adjusted for clinical risk factors that vary across patient populations, are unrelated to quality, and influence the outcome. Details about the risk-adjustment model are above in S.11.

6. Use statistical bootstrapping to construct a 95% confidence interval estimate for each facility's RSHVR.

For more information about the measure methodology, please see the Facility 7-day Risk-Hospital Visits after Hospital Outpatient Surgery Measure Technical Report posted on the web page provided in data field S.1.

Submission items

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

5.1 Identified measures: 2539 : Facility Level 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

2687 : Hospital Visits after Hospital Outpatient Surgery

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. The measures' outcomes are harmonized.

5b.1 If competing, why superior or rationale for additive value: Not applicable. There are no competing measures.

2687 Hospital Visits after Hospital Outpatient Surgery

5.1 Identified measures: 2539 : Facility Level 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable.

5b.1 If competing, why superior or rationale for additive value: Not applicable.

Comparison of NQF #3357 and NQF #2539

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)
2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Steward

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Centers for Medicare & Medicaid Services (CMS)

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Centers for Medicare & Medicaid Services (CMS)

Description

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Facility-level risk-standardized rate of acute, unplanned hospital visits within 7 days of a general surgery procedure performed at an ambulatory surgical center (ASC) among Medicare Fee-For-Service (FFS) patients aged 65 years and older. An unplanned hospital visit is defined as an emergency department (ED) visit, observation stay, or unplanned inpatient admission

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Rate of risk-standardized, all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy among Medicare fee-for-service (FFS) patients aged 65 years and older.

Type

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Outcome

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Outcome

Data Source

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Claims, Enrollment Data

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Claims, Enrollment Data

Level

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Facility

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Facility

Setting

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Outpatient Services

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Hospital : Acute Care Facility, Outpatient Services

Numerator Statement

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

The outcome being measured is acute, unplanned hospital visits (ED visit, observation stay, or unplanned inpatient admission) occurring within 7 days of a general surgery procedure performed at an ASC.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

The outcome for this measure is all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy. We define a hospital visit as any emergency department (ED) visit, observation stay, or unplanned inpatient admission.

Numerator Details

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Outcome Definition

The outcome is unplanned hospital visits, defined as an ED visit, observation stay, or unplanned inpatient admission, occurring within 7 days of the general surgery procedure performed at an ASC identified using Centers for Medicare & Medicaid Services (CMS) Medicare administrative claims data.

Time Period for Data

Numerator time window: 7 days after ASC procedures for unplanned hospital visits.

Denominator time window: General surgery ASC procedures performed during the measurement period.

Identification of Planned Admissions

The measure outcome includes hospital visits within the first 7 days following the procedure, unless that inpatient admission is deemed a “planned” admission. We applied CMS’s Planned Readmission Algorithm Version 4.0 to identified planned admissions [1]. Planned admissions are defined as those planned by providers for anticipated medical treatment or procedures that must be provided in the inpatient setting. CMS seeks to count only unplanned admissions in the measure outcome because variation in planned admissions does not reflect quality differences. The algorithm (see the flowchart in the Data Dictionary, first tab, “S.6 Planned Adm Alg Flowchart”) identifies inpatient admissions that are typically planned and may occur after the patient’s index general surgery procedure, considering a few specific, limited types of care as “planned”(e.g., major organ

transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute inpatient admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers inpatient admissions for acute illness or for complications of care planned. The algorithm considers inpatient admissions that include potentially planned procedures with acute diagnoses, or with diagnoses that might represent complications of a surgery, as "unplanned" and thus counts these inpatient admissions in the measure outcome.

Details of the planned admission algorithm and codes to identify planned admissions are in the attached Data Dictionary sheet labeled "S.6 Planned Adm Alg."

Definition of ED Visits and Observation Stay

The measure defines ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims.

The codes used to define ED visits and observation stays are in the attached Data Dictionary sheet labeled "S.6 Numerator-ED Obs Def."

Citations

1. Horwitz L, Grady J, Cohen D, et al. Development and validation of an algorithm to identify planned readmissions from claims data. Journal of Hospital Medicine. Oct 2015;10(10):670-677.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Outcome Definition

The outcome for this measure is all-cause, unplanned hospital visits within 7 days of an outpatient colonoscopy. Hospital visits include ED visits, observation stays, and unplanned inpatient admissions. If more than one unplanned hospital visit occurs, only the first hospital visit within the outcome timeframe is counted in the outcome.

Identification of Planned Admissions

The measure outcome includes any inpatient admission within the first 7 days after the colonoscopy, unless that admission is deemed a "planned" admission as defined by the measure's planned admission algorithm. The Centers for Medicare & Medicaid Services (CMS) seeks to count only unplanned admissions in the measure outcome, because variation in "planned" admissions does not reflect quality differences. We based the planned admission algorithm on the CMS Planned Readmission Algorithm Version 4.0, which CMS created for its hospital-wide readmission measure. In brief, the algorithm identifies admissions that are typically planned and may occur after the patient's index event. The algorithm always considers a few specific, limited types of care planned (e.g., major organ transplant, rehabilitation, or maintenance chemotherapy). Otherwise, the algorithm defines a planned admission as a non-acute admission for a scheduled procedure (e.g., total hip replacement or cholecystectomy), and the algorithm never considers admissions for acute illness or for complications of care planned. For example, the algorithm considers hip replacement unplanned if hip fracture (an acute condition) is the discharge diagnosis, but planned if osteoarthritis (a non-acute condition) is the discharge diagnosis. The algorithm considers admissions that include potentially planned procedures with acute diagnoses or that might represent complications of a colonoscopy unplanned and thus counts these admissions in the measure outcome.

For more information about the Planned Admission Algorithm, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure 2016 Measure

Updates and Specifications Report posted on the web page provided in data field S.1. Also see sheets 'Numerator- Table PA1' – 'Numerator-Table PA4' in the attached Data Dictionary for how the measure defines 'always planned procedures' (PA1), 'always planned diagnoses' (PA2), 'potentially planned procedures' (PA3), and 'acute' diagnoses (PA4).

Definition of ED and Observation Stay

We defined ED visits and observation stays using one of the specified billing codes or revenue center codes identified in Medicare Part B Outpatient hospital claims. The codes that define ED visits and observation stays are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def."

Denominator Statement

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries

de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

Exclusions: The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Colonoscopies performed at hospital outpatient departments (HOPDs) and ambulatory surgical centers (ASCs) for Medicare FFS patients aged 65 years and older.

Denominator Details

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Target Population

Included patients:

The target population for this measure is Medicare FFS patients aged 65 years and older, who are undergoing outpatient general surgery procedures in ASCs that are within the scope of general surgery training. Specifically, the cohort of procedures includes the

following types of surgeries: abdominal, alimentary tract, breast, skin/soft tissue, wound, and varicose vein.

The Medicare FFS population was chosen because of the availability of a national dataset (Medicare claims) that could be used to develop, test, and publicly report the measure. We limit the measure to patients who have been enrolled in Medicare FFS Parts A and B for the 12 months prior to the date of surgery to ensure that we have adequate data for identifying comorbidities for risk adjustment.

Included procedures:

The target group of procedures is surgical procedures that (1) are routinely performed at ASCs, (2) involve risk of post-surgery hospital visits, and (3) are within the scope of general surgery training. The scope of general surgery overlaps with that of other specialties (for example, vascular surgery and, plastic surgery). For this measure, we targeted surgeries that general surgeons are trained to perform with the understanding that other subspecialists may also be performing many of these surgeries at ASCs. Since the type of surgeon performing a particular procedure may vary across ASCs in ways that affect quality, the measure is neutral to surgeons' specialty training.

To identify eligible ASC general surgery procedures, we first identified a list of procedures from Medicare's 2014 and 2015 ASC lists of covered procedures, which include procedures for which ASCs can be reimbursed under the ASC payment system. This lists of surgeries is publicly available at: https://www.cms.gov/medicare/medicare-fee-for-service-payment/ascpayment/11_addenda_updates.html (download January 2014 and January 2015 ASC Approved HCPCS Code and Payment Rates, Addendum AA). Surgeries on the ASC list of covered procedures do not involve or require: major or prolonged invasion of body cavities, extensive blood loss, major blood vessels, or care that is either emergent or life-threatening. The ASC list is annually reviewed and updated by Medicare, and includes a transparent public comment submission and review process for addition and/or removal of procedure codes. Using an existing, defined list of surgeries, rather than defining surgeries de novo, is useful for long-term measure maintenance. Procedures listed in Medicare's list of covered ASC procedures are defined using Healthcare Common Procedure Coding System (HCPCS) and Common Procedural Terminology (CPT®) codes.

Ambulatory procedures include a heterogeneous mix of non-surgical procedures, minor surgeries, and more substantive surgeries. The measure is not intended to include very low-risk (minor) surgeries or non-surgical procedures, which typically have a high volume and a very low outcome rate. Therefore, to focus the measure only on the subset of surgeries on Medicare's list of covered ASC procedures that impose a meaningful risk of post-procedure hospital visits, the measure includes only "major" and "minor" procedures, as indicated by the Medicare Physician Fee Schedule global surgery indicator (GSI) values of 090 and 010, respectively. The GSI code reflects the number of post-operative days that are included in a given procedure's global surgical payment and identifies surgical procedures of greater complexity and follow-up care. This list of GSI values is publicly available for calendar year (CY) 2014 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1600-FC.html and for CY 2015 at: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1612-FC.html (download PFS Addenda, Addendum B).

Finally, to identify the subset of general surgery ASC procedures, we reviewed with consultants and Technical Expert Panel (TEP) members the Clinical Classifications Software (CCS) categories of procedures developed by the Agency for Healthcare Research and Quality (AHRQ). We identified and included CCS categories within the scope of general surgery, and only included individual procedures within the CCS categories at the procedure (CPT® code) level if they were within the scope of general surgery practice. We did not include in the measure gastrointestinal endoscopy, endocrine, or vascular procedures, other than varicose vein procedures, because reasons for hospital visits are typically related to patients' underlying comorbidities.

See the attached Data Dictionary, sheet S.9 "Codes Used to Define Cohort" for a complete list of all CPT procedure codes included in the measure cohort.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Target Population

The measure includes colonoscopies performed at HOPDs and ASCs. The measure calculation package calculates a facility-level score for all eligible facilities separately for HOPDs and ASCs.

The target population is patients aged 65 years and older who are generally well and have a colonoscopy to screen for colorectal cancer, biopsy or remove pre-cancerous lesions, or evaluate non-emergent symptoms and signs of disease. We limited the measure cohort to patients who are 65 and older, enrolled in Medicare FFS, and have been enrolled in Part A and Part B Medicare for the 12 months prior to the date of procedure since national data linking risk factors, procedures, and outcomes across care settings are only available for this group.

Eligible colonoscopies were identified using specified Current Procedural Terminology (CPT)/Healthcare Common Procedure Coding System (HCPCS) procedure codes in the Medicare Carrier (Part B Physician) Standard Analytical File (SAF). The CPT and HCPCS procedure codes that define the cohort are in the attached Data Dictionary, sheet "S.9 Denominator Details-Cohort."

We considered all colonoscopy codes during development of the measure cohort. We did not include in the measure colonoscopy CPT procedure codes that reflected fundamentally higher-risk or different procedures. Those procedures billed with a qualifying colonoscopy procedure code and a high-risk colonoscopy procedure code (see attached Data Dictionary, sheet "S.9 Denominator Details-Hgh Rsk") were not included in the measure.

Colonoscopy is not possible among patients who have had a prior total colectomy. Any claim for a colonoscopy in a patient with a prior total colectomy is therefore likely to be a coding error. We perform an error check to ensure the measure does not include these patients with a total colectomy recorded in their prior medical history. The CPT and HCPCS procedure codes and International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and ICD-10-CM codes that define the total colectomy data reliability check are in the attached Data Dictionary, sheet "S.9 Denominator Details-Colect."

Capture of Colonoscopies Affected by the Medicare 3-Day Payment Window Policy:

Colonoscopies performed at HOPDs can be affected by the Medicare 3-day payment window policy. The policy states that outpatient services (including all diagnostic services such as colonoscopy) provided by a hospital or any Part B entity wholly owned or wholly

operated by a hospital (such as an HOPD) in the 3 calendar days preceding the date of a beneficiary's inpatient admission are deemed to be related to the admission [1]. For outpatient colonoscopies affected, the facility claim (for the technical portion of the colonoscopy) is bundled with the inpatient claim, although the Medicare Part B physician claim for professional services rendered is still submitted. This policy has implications for the measure because it may lead to: (1) failure to completely capture outpatient colonoscopies performed at HOPDs; and (2) underreporting of outcomes for colonoscopies performed in the HOPD setting.

To ensure the capture of HOPD colonoscopies, we identify physician claims for colonoscopy in the HOPD setting from Medicare Part B claims, which had an inpatient admission within 3 days and lacked a corresponding HOPD facility claim. We then attribute the colonoscopies identified as affected by this policy to the appropriate HOPD facility using the facility provider ID from the inpatient claim.

Citations

1. Centers for Medicare & Medicaid Services (CMS). Three Day Payment Window. 2013; http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Three_Day_Payment_Window.html

Exclusions

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

The measure excludes surgeries for patients without 7 or more days of continuous enrollment in Medicare FFS Parts A and B after the surgery. The measure excludes these patients to ensure all patients have full data available for outcome assessment.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

We established the following exclusion criteria after reviewing the literature, examining existing measures, discussing alternatives with the working group and technical expert panel (TEP) members, and reviewing feedback from the national dry run held in July 2015. The goal was to be as inclusive as possible; we excluded only those high-risk procedures and patient groups for which risk adjustment would not be adequate or for which hospital visits were not typically a quality signal. The exclusions, based on clinical rationales, prevent unfair distortion of performance results.

1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the 7 days after the procedure.

Rationale: We exclude these patients to ensure full data availability for outcome assessment.

2) Colonoscopies that occur concurrently with high-risk upper gastrointestinal (GI) endoscopy procedures.

Rationale: Patients undergoing concurrent high-risk upper GI endoscopy procedures, such as upper GI endoscopy procedures for the control of bleeding or treatment of esophageal varices, are often unwell and have a higher risk profile than typical colonoscopy patients. Therefore, these patients have a disproportionally higher risk for the outcome.

3) Colonoscopies for patients with a history of inflammatory bowel disease (IBD) or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim.

Rationale: We exclude these patients because:

-IBD is a chronic condition; patients with IBD undergo colonoscopy both for surveillance due to increased cancer risk and for evaluation of acute symptoms. IBD is likely to be coded as the primary diagnosis prompting the procedure irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure in the setting of an acute exacerbation of IBD. Therefore, we may not be able to adequately risk adjust for these patients as we cannot identify relatively well versus acutely unwell patients among visits coded as IBD.

-Our aim is to capture hospital visits which reflect the quality of care. Admissions for acutely ill IBD patients who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of an IBD flare do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the 2014 Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted at https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier3&cid=1228775197506) for full description of the dataset), more than one-third of IBD patients admitted to the hospital with colonoscopy had a discharge diagnosis of IBD, indicating their admission was for medical treatment of their IBD. We therefore excluded this group so that providers who treat a disproportionate number of IBD patients will not be disadvantaged in the measure.

-A post-index diagnosis of IBD, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded.

4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim.

Rationale: We exclude these patients because:

-It is unclear what the health status is of patients coded with a history or current diagnosis of diverticulitis, making it difficult to fully risk adjust for patients' health. Colonoscopies performed on patients with a history or current diagnosis of diverticulitis are likely to be coded as diverticulitis as the primary diagnosis irrespective of whether the patients are undergoing a screening procedure or a diagnostic procedure (i.e., are acutely unwell with active disease). Furthermore, the codes for diverticulitis and diverticulosis may not be consistently used; patients with diverticulosis may be erroneously coded as diverticulitis. Therefore, we may not be able to adequately risk adjust as we cannot identify relatively well versus acutely unwell patients among visits coded as diverticulitis.

-Admissions for acutely ill patients with a history or current diagnosis of diverticulitis who are evaluated with an outpatient colonoscopy and are subsequently admitted for medical treatment of do not reflect the quality of the colonoscopy. In our 2010 Medicare 20% FFS Full Development Sample (see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy Measure Technical Report posted on the web page provided in data field S.1) more than one-quarter of patients with a history or current diagnosis of diverticulitis admitted to the hospital post colonoscopy had a discharge diagnosis of diverticulitis, indicating they were admitted for medical treatment of the condition. These admissions are likely unrelated to the quality of the colonoscopy. We therefore excluded this group so that providers who treat a disproportionate number of diverticulitis patients will not be disadvantaged in the measure.

-A post-index diagnosis of diverticulitis, which represents a very small fraction of cases (less than 0.5% of the cohort) in the measure population, indicates that the condition was likely present at the time of the index colonoscopy but not coded.

5) Colonoscopies that occur on the same hospital outpatient claim as an ED visit (applies to colonoscopies at HOPDs only).

Rationale: We exclude these patients because:

-The sequence of events in these cases is not clear. It is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the ED visit.

6) Colonoscopies that occur on the same day and at the same hospital as an ED visit that is billed on a separate claim than the index colonoscopy (applies to colonoscopies at HOPDs only)

Rationale: We exclude these patients because:

-It is unclear whether the same-day ED visit occurred before or after the colonoscopy. However, for ED visits billed on the same day but at a different facility, it is unlikely that a patient would experience an ED visit for an acute diagnosis at one facility and then travel to another facility for a routine colonoscopy on the same day. Therefore, these colonoscopies are not excluded because they likely represent a routine procedure followed by a complication of care.

7) Colonoscopies that occur on the same hospital outpatient claim as an observation stay (applies to colonoscopies at HOPDs only).

Rationale: We exclude these patients because:

-The sequence of events in these cases is not clear. It is not possible to use claims data to determine whether the colonoscopy was the cause of, subsequent to, or during the observation stay.

8) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within 7 days.

Rationale: We exclude these patients because:

-The two colonoscopies are considered part of a single episode of care, for which the subsequent colonoscopy is considered the index procedure.

Exclusion Details

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Lack of 7 or more days of continuous enrollment in Medicare FFS after the ASC surgery is determined by patient enrollment status in FFS Parts A and B using the Medicare enrollment file (unless lack of enrollment was due to death). The procedure must be 7 or more days from the end of the month or the enrollment indicators must be appropriately marked for the month that falls within 7 days of the procedure date (unless disenrollment is due to death), otherwise the procedure is excluded.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

1) Colonoscopies for patients who lack continuous enrollment in Medicare FFS Parts A and B in the 7 days after the procedure.

Lack of continuous enrollment in Medicare FFS for 7 days after the procedure is determined by patient enrollment status in FFS Parts A and B using the Medicare Enrollment Database. The enrollment indicators must be appropriately marked for the month(s) which fall within 7 days of the procedure date.

2) Colonoscopies that occur concurrently with high-risk upper GI endoscopy procedures.

The list of the CPT codes for the upper GI endoscopy procedures identified as "high-risk" are in attached Data Dictionary, sheet "S.11 Denom. Exclusion Upper En."

3) Colonoscopies for patients with a history of IBD or diagnosis of IBD at time of index colonoscopy or on the subsequent hospital visit outcome claim.

The ICD-9-CM and ICD-10-CM codes that define IBD are in the attached Data Dictionary, sheet "S.11 Denom. Exclusion IBD."

4) Colonoscopies for patients with a history of diverticulitis or diagnosis of diverticulitis at time of index colonoscopy or on the subsequent hospital visit outcome claim.

The ICD-9-CM and ICD-10-CM codes that define diverticulitis are in the attached Data Dictionary, sheet "S.11 Denom. Exclusion Divertic."

5) Colonoscopies that occur on the same hospital outpatient claim as an ED visit.

The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def." (Applies to colonoscopies at HOPDs only)

6) Colonoscopies that occur on the same day and at the same hospital as an ED visit that is billed on a separate claim than the index colonoscopy.

The billing and revenue center codes that define ED visits are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def." The same facility is defined as having the same CMS Certification Number (CCN). (Applies to colonoscopies at HOPDs only)

7) Colonoscopies that occur on the same hospital outpatient claim as an observation stay.

The billing and revenue center codes that define observation stays are in the attached Data Dictionary, sheet "S.6 Numerator-ED Obs Def." (Applies to colonoscopies at HOPDs only)

8) Colonoscopies followed by a subsequent outpatient colonoscopy procedure within 7 days.

For cases in which a colonoscopy is followed by another colonoscopy within 7 days, the measure will use the subsequent colonoscopy as the index colonoscopy.

Risk Adjustment

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Statistical risk model

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Statistical risk model

Stratification

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Not applicable.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Not applicable

Type Score

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

Ratio

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

Rate/proportion

Algorithm

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

The measure uses a two-level hierarchical logistic regression model to estimate ASC-level risk-standardized hospital visit ratios (RSHVRs). This approach accounts for the clustering of patients within ASCs and variation in sample size across ASCs. The RSHVR is calculated as the ratio of the predicted to the expected number of post-surgical unplanned hospital visits among ASC's patients. For each ASC, the numerator of the ratio is the number of hospital visits predicted for the ASC's patients, accounting for its observed rate, the number and complexity of general surgery procedures performed at the ASC, and the case mix. The denominator is the number of hospital visits expected nationally for the ASC's case/procedure mix. To calculate an ASC's predicted-to-expected (P/E) ratio, the measure uses a two-level hierarchical logistic regression model. The log-odds of the outcome for an index procedure is modeled as a function of the patient demographic, comorbidity, procedure characteristics, and a random ASC-specific intercept. A ratio greater than one indicates that the ASC's patients have more visits than expected, compared to an average ASC with similar patient and procedural complexity. A ratio less than one indicates that the ASC's patients have fewer post-surgical visits than expected, compared to an average ASC with similar patient and procedural complexity. This approach is analogous to an observed-to-expected ratio, but accounts for within-facility correlation of the observed outcome and sample size differences and accommodates the assumption that underlying differences in quality across ASCs lead to systematic differences in outcomes, and is tailored to and appropriate for a publicly reported outcome measure as articulated in published scientific guidelines [1-3].

Please see Appendix D of the attached technical report for details.

Citations

1. Normand S-LT, Shahian DM. Statistical and clinical aspects of hospital outcomes profiling. Statistical Science. 2007;22(2):206-226.

2. Krumholz HM, Brindis RG, Brush JE, et al. Standards for Statistical Models Used for Public Reporting of Health Outcomes An American Heart Association Scientific Statement From the Quality of Care and Outcomes Research Interdisciplinary Writing Group: Cosponsored by the Council on Epidemiology and Prevention and the Stroke Council Endorsed by the American College of Cardiology Foundation. Circulation. 2006;113(3):456-462.

3. National Quality Forum. Measure Evaluation Criteria and Guidance for Evaluating Measures for Endorsement. 2015;

http://www.qualityforum.org/Measuring_Performance/Submitting_Standards/2015_Measure_Evaluation_Criteria.aspx. Accessed July 26, 2016.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

The measure is calculated separately for HOPDs and ASCs.

1. Identify colonoscopies meeting the inclusion criteria described above in S.9.

2. Exclude procedures meeting any of the exclusion criteria described above in S.11.

3. Identify and create a binary (0/1) flag for an unplanned hospital visit within 7 days of the colonoscopy described above in Section S.5.

4. Use patients' historical and index procedure claims data to create risk adjustment variables.

5. Fit a hierarchical generalized linear model (HGLM) to produce a ratio of the number of "predicted" hospital visits to the number of "expected" hospital visits for each facility, given its case mix.

- The HGLM is adjusted for clinical risk factors that vary across patient populations, are unrelated to quality, and influence the outcome. Details about the risk-adjustment model are above in S.14.

6. Multiply the ratio estimated in step 3 by the observed national 7-day hospital visit rate to obtain a risk-standardized hospital visit (RSHV) rate for each facility.

7. Use bootstrapping to construct a 95% confidence interval estimate for each facility's RSHV rate.

For more information about the measure methodology, please see the Facility 7-day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy 2016 Measure Updates and Specifications Report posted on the web page provided in data field S.1.

Submission items

3357 Facility-Level 7-Day Hospital Visits after General Surgery Procedures Performed at Ambulatory Surgical Centers (ASC)

5.1 Identified measures: 2539 : Facility Level 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

2687 : Hospital Visits after Hospital Outpatient Surgery

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable. The measures' outcomes are harmonized.

5b.1 If competing, why superior or rationale for additive value: Not applicable. There are no competing measures.

2539 Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact: Not applicable.

5b.1 If competing, why superior or rationale for additive value: One NQF-endorsed measure has a different focus and outcome but shares some similarities with our measure, so we mention it here for completeness: NQF #0265: ASC Hospital Transfer/Admission Measure (ASC Quality Collaboration). The measure focus is all procedures and surgeries at

ASCs (including colonoscopies). Therefore, the cohort has limited overlap with the cohort of our measure; it includes a much broader range of surgeries and procedures at ASCs, and does not cover outpatient colonoscopies performed at HOPDs. Its outcome is same-day transfer for admission, which accounts for a very small subset of the hospital visits assessed in our measure.

National Quality Forum
1030 15th St NW, Suite 800
Washington, DC 20005
http://www.qualityforum.org

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