

**Summary of Technical Expert Panel Meeting
June 9, 2017:
Measure of Hospital Visits after General Surgery Ambulatory Surgical
Center Procedures**

July 3, 2017

Prepared by:

Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation
(CORE)

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Background

The Centers for Medicare & Medicare Services (CMS) has contracted with Yale New Haven Health Services Corporation – Center for Outcomes Research and Evaluation (CORE) to develop claims-based outcomes measures to assess quality of care delivered at ambulatory surgical centers (ASCs). Specifically, CORE is developing a risk-adjusted measure of acute care visits after general surgery ASC procedures. This measure will assess ASC-level quality based on how often their patients have unplanned hospital visits (emergency department visits, observation stays, and unplanned inpatient admissions) within seven days of general surgery procedures.

As is standard with all measure development processes, CORE has convened a technical expert panel (TEP) to inform measure development. See [Appendix A](#) for the TEP roster, including the content expertise and conflict of interest disclosures from each TEP member. This report summarizes the feedback and recommendations received from the TEP during the first and second TEP meetings. CORE has updated the technical report to include feedback and recommendations from the TEP.

Measure Development Team

Dr. Vinitha Meyyur, the project's CMS Contracting Officer's Representative, attended both TEP meetings and oversees the work. Additional CMS staff, including Dr. Anita Bhatia, attended the first TEP meeting and provide ongoing input.

Dr. Jennifer Schwartz (a health services researcher and Associate Research Scientist at the Yale School of Medicine) leads the CORE measure development team, and Dr. Elizabeth Drye, Director of Quality Measurement at CORE and a Research Scientist at the Yale School of Medicine, oversees the work. In addition, CORE is supported by two clinical and one statistical consultant. See [Appendix B](#) for the full list of members of the CORE development team and individuals consulted during measure development.

The TEP

In alignment with the CMS Measures Management System, CORE released a 30-day public call for nominations to convene a TEP for the development of measures of hospital visits after ASC procedures in March of 2016. CORE solicited potential TEP members via direct email, CMS email distributions, and through a public posting on CMS's website. The TEP met several times to discuss two related prior measures covering urology and orthopedic procedures at ASCs. The TEP was reconvened in October of 2016 to specifically discuss this measure of hospital visits after general surgery ASC procedures.

The TEP's role in development is to provide feedback on key conceptual, clinical, and methodological decisions made in consultation with CORE's measure development team. The TEP is comprised of individuals with diverse perspectives and backgrounds, and includes clinicians, surgeons, patients, patient advocates, and other stakeholders with expertise in

ambulatory surgery, performance measurement, quality improvement, and patient safety. The appointment term for this TEP is from October 2016 through September 2017.

Specific Responsibilities of the TEP Members

- Complete and submit all nomination materials, including the TEP Nomination Form, statement of interest, and curriculum vitae
- Review background materials provided by CORE prior to each TEP meeting
- Participate in TEP conference calls
- Provide input on key clinical and methodological decisions about the approach to measurement
- Provide feedback to CORE on other non-technical issues related to the measures, such as the usability of the measure scores
- Review the TEP summary report prior to public release
- Be available to discuss recommendations following submission of the measures to CMS

TEP Members

Table 1. TEP Member Name, Affiliation, and Location

Name	Organization (Title)	Location
Kirk Campbell, MD	New York University Hospital for Joint Diseases (Clinical Assistant Professor of Orthopedic Surgery)	New York, NY
Gary Culbertson, MD, FACS	Iris Surgery Center (Surgeon; Medical Director)	Sumter, SC
Martha Deed, PhD	Consumers Union Safe Patient Project (Patient Safety Advocate)	Austin, TX
James Dupree, MD, MPH	University of Michigan (Urologist; Health Services Researcher)	Ann Arbor, MI
Nestor Esnaola, MD, MPH, MBA	Fox Chase Cancer Center (Professor of Surgery; Associate Director for Cancer Health Disparities and Community Engagement)	Philadelphia, PA
John Gore, MD, MS	University of Washington (Associate Professor of Urology)	Seattle, WA
Lisa Ishii, MD, MHS	Johns Hopkins School of Medicine (Associate Professor); American Academy of Otolaryngology-Head and Neck Surgery (Coordinator for Research and Quality)	Baltimore, MD; Alexandria, VA
Atul Kamath, MD	Perelman School of Medicine, University of Pennsylvania (Assistant Professor and Clinical Educator Director of Orthopedic Surgery); Hospital of the University of Pennsylvania (Attending Surgeon)	Philadelphia, PA

Name	Organization (Title)	Location
Tricia Meyer, PharmD, MS, FASHP	Scott & White Medical Center (Regional Director of Pharmacy); Texas A&M University College of Medicine (Associate Professor of Anesthesiology)	Temple, TX
Amita Rastogi, MD, MHA, CHE, MS	Health Care Incentives Improvement Institute (Chief Medical Officer)	<i>Newtown, CT</i>
Donna Slosburg, RN, BSN, LHRM, CASC	ASC Quality Collaboration (Executive Director)	St. Pete Beach, FL
Julie Thacker, MD, MPH <i>(joined the TEP in October 2016)</i>	Duke Health and Hospital System (Medical Director of Evidence-Based Perioperative Care); Duke School of Medicine Clinical Research Unit (Medical Director, Department of Surgery)	Durham, NC
Thomas Tsai, MD, MPH	Brigham and Women's Hospital (General Surgeon); Harvard School of Public Health (Research Associate)	Boston, MA
Patient	Participation is confidential	—
Patient	Participation is confidential	—

TEP Meetings

CORE held the first TEP meeting on January 9, 2017 and the second meeting on June 9, 2017 (see [Appendix C](#) for the TEP meeting schedule). This report contains a summary of the January 9 and June 9 meetings.

TEP meetings follow a structured format consisting of the presentation of key issues identified during measure development, as well as CORE's proposed approaches to addressing the issues, followed by an open discussion of these issues by the TEP members.

First TEP Meeting Overview

During the first TEP meeting, CORE staff presented the project overview, project background, and challenges in measuring ASC quality. CORE then reviewed the evidence for the general surgery measure and the procedures proposed for inclusion in the general surgery cohort. TEP members commented on various aspects of the measure, including the procedure categories proposed for inclusion in the general surgery measure during the meeting.

Specifically, the TEP:

- Approved of the approach to define the measure cohort.
- Encouraged the measure development team to further investigate vascular procedures for inclusion in the cohort.
- Commented on the number of facilities with adequate sample size and the outcome rates.
- Suggested variables for inclusion in the risk adjustment process.
- Agreed with the measure development team cohort recommendation.
- Approved of the outcome as an indicator of quality for the proposed procedures in the cohort.

CORE invited TEP members to provide further input on the procedures included in the measure by email. Several TEP members shared additional thoughts and/or questions, by email.

The following bullets represent a summary of what was discussed during the first TEP meeting.

Overview of Project Status

- Key Issues Discussed:
 - CORE provided an overview of the project to develop a quality measure of unplanned hospital visits following general surgery ASC procedures on the facility level using administrative claims data. This measure is related to four measures developed by CORE under contract to CMS: (1) 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy; (2) Hospital Visits after Hospital Outpatient Surgery; (3) Hospital Visits after Orthopedic ASC Procedures; and (4) Hospital Visits after Urology ASC Procedures. This TEP was convened for the project to develop measures of hospital visits after select procedures including urology and orthopedic procedures. Some of the TEP members served on a prior TEP for the Hospital Visits after Hospital Outpatient Surgery measure.
 - The development of this measure will span about six months and include eight steps, three of which were the topics of the first TEP meeting: development of 1) measure concept; 2) measure outcome; and 3) measure cohort. The future meetings will focus on the remaining steps including risk model development, measure testing, public comment, and the final measure specifications.
- TEP Feedback:
 - None

Key Concepts & Question #1

- Key Issues Discussed:
 - CORE reviewed the measure outcome and rationale for developing a general surgery measure. The general surgery measure cohort is designed to (1) have an adequate number of cases for reliable risk adjustment; (2) allow fair comparison of ASC surgical quality with risk adjustment; (3) include procedures for which hospital visits within seven days is a signal of quality; and (4) can be clearly described and understood by providers, consumers, and stakeholders.

- To inform the measure cohort development, CORE presented the scope of general surgeons' training and practice, which is broad and often followed by subspecialized fellowships. Not all procedures within the scope of general surgery are typically performed at ASCs since ASC facilities are only equipped to care for healthier patients who can return home on the day of the procedure. Based on general surgery training and procedures typically performed at ASCs, CORE investigated the following types of procedures for inclusion in the cohort:
 - 1. Abdominal (example: hernia repair or cholecystectomies)
 - 2. Alimentary (example: upper or lower gastrointestinal procedures or anorectal procedures)
 - 3. Breast (example: breast prosthesis)
 - 4. Skin/soft tissue (example: skin grafting)
 - 5. Wound (example: wound suturing or stitches)
 - 6. Vascular (example: varicose vein stripping)
 - 7. Endocrine (example: thyroidectomies)
- CORE recommended combining procedures within the scope of general surgery to reflect common general surgery training and to allow the aggregation of enough procedures to build a reliable risk-adjusted measure.
- Key Questions for the TEP:
 - Would a measure that combines these types of procedures within the scope of general surgery be understandable and actionable, given that ASCs perform a subset of these procedures?
 - If we can adequately risk adjust for differences in outcome rates, is it conceptually appropriate to compare ASCs that may perform different types of procedures?
- TEP Feedback:
 - One TEP member was surprised by the number and varied scope of specialties that can follow general surgery training.
 - Another TEP member approved of the approach to combine general surgery procedures for the measure cohort since there are common outcomes leading to hospital visits that could be prevented by ASC facilities. The same TEP member pointed out that ASCs vary in patient and procedure mix, and those that serve healthier patients and perform minor procedures may appear as high performers.
 - An additional TEP member expressed concern and inquired whether some of the vascular procedures should be performed in the ASC setting and particularly on patients 65 years and older given procedure complexity.
 - Another TEP member stated that measuring outcomes for high-risk patients to identify cases that should not have been served in the ASC setting would be valuable. They approved of the measure concept and reiterated the value of identifying inappropriate care.
 - One TEP member pointed out that the American Society of Plastic Surgery and the American Society of Anesthetic Plastic Surgery have guidelines and patient criteria for procedures done in the outpatient setting. They speculated that similar guidelines are set for other specialties, such as vascular.

- Another TEP member pointed out that facility scores may cluster based on the procedures performed at facilities due to inherently different levels of risk. They suggested adjusting for Diagnosis-Related Groups (DRGs) or similar risk adjustment variables. An additional TEP member agreed that adjusting for type of procedure may be important.
 - The CORE team reminded TEP members that the measure will adjust for differences in procedural and patient complexity, such as work relative value units (RVUs). CORE agreed the measure should not discourage or penalize facilities for serving higher risk patients. During the development of the risk adjustment model, CORE will investigate risk adjustment variables, including those that account for differences in procedure mix.
- Summary:
 - TEP members approved of the approach to combine general surgery procedure categories for the measure cohort, raised a concern around differences in procedure complexity and risk for the vascular procedure category, and provided suggestions for risk adjustment.

Analyses of Potentially Included Procedures

- Key Issues Discussed:
 - CORE reviewed the analyses conducted with the seven procedure categories, which aimed to examine:
 - Post-procedure hospital visit rates and whether they are elevated and over what time period in order to determine whether hospital visits reflect quality; and
 - Reasons for hospital visits within seven days and whether they are plausibly related to the procedure and can be lowered through optimal care to determine whether hospital visits within seven days reflect quality.
 - The data for these analyses were 100% Medicare fee-for-service (FFS) claims for calendar year 2015.
 - To link patient information across settings and adjust for patient conditions, patients included in the data: (1) were 65 years or older at the time of the procedure; (2) were enrolled in traditional FFS Medicare; (3) had 12 months of prior FFS enrollment; and (4) had at least seven days of FFS enrollment following the ASC procedure.
 - Procedures included in the analyses were those CMS has deemed appropriate and reimbursable for the ASC setting and labeled as 010 (minor) or 090 (major) on the Global Surgical Package (GSP) list.
- TEP Feedback:
 - One TEP member inquired whether the procedures are those that are currently performed at ASCs or procedures that could be performed at ASCs.
 - The CORE team confirmed that all possible procedures that reflect common general surgery training and have been approved for reimbursement by CMS when performed at ASCs were included, despite whether they were performed in ASCs on Medicare patients 65 year or older in 2015.

- Summary:
 - TEP members inquired about the scope of procedures included in the analyses.

Summary of Key Analytic Findings and Question #2

- Key Issues Discussed:
 - CORE presented the key analytic findings and how the results informed the cohort recommendation.
 - The most common procedure category for Medicare patients 65 years and older was skin/soft tissue with 115,000 procedures and 800 ASC facilities performing at least 25 skin/soft tissue procedures. Each procedure category had at least 10,000 procedures except for endocrine, which had 649 procedures.
 - The most common reasons for hospital visits appeared related to the ASC procedures, except among endocrine procedures. Common reasons included urinary retention, post-operative pain, and complications of medical care. The most common reasons for hospital visits following endocrine procedures appear related to the patients' underlying diseases. The team recommended excluding endocrine procedures because there are few endocrine procedures performed in few facilities, and the reasons for hospital visits appeared related to the underlying patient condition, rather than ASC quality.
 - Overall, the hospital visit rate was 2.4% but varied across general surgery procedure categories. In addition, the reasons for hospital visits confirm that the procedure categories, except endocrine, are ideal for quality measurement.
 - Decay curves, which display for each procedure category the daily rate of overall hospital visits for 30 days after ASC procedures, showed that unplanned hospital visits are elevated within the first week following most procedure categories.
- Key question for the TEP:
 - For each procedure type, considering the reasons for the hospital visit and post-procedure hospital visit rate, do you agree that the outcome of seven-day hospital visits following general surgery and related procedures reflects quality of care?
- TEP Feedback:
 - One TEP member was surprised by the number of endocrine procedures since many patients have their thyroid removed in the outpatient setting.
 - Another TEP member pointed out the low volume of facilities, compared to the total number (5,400) of CMS-certified ASCs in the country. An additional TEP member pointed out the low outcome rates, compared to the orthopedic and urology ASC measures. They suggested focusing on procedures with high rates of unplanned hospital visits.
 - The CORE team pointed out that once the procedure categories are combined into the measure cohort, more ASC facilities will have at least 25 procedures performed in the dataset. CORE will share the overall number of ASCs with at least 25 procedures with the TEP once the cohort is finalized. The variation in rates across ASCs is important to highlight opportunities for quality improvement. In addition, related measures that

CORE has developed which evaluate hospital visits after outpatient colonoscopy procedures have brought awareness of hospital visits to ASC facilities. Outcome information is important because these are common procedures performed on relatively healthy patients.

- One TEP member inquired whether the measure will include colonoscopy procedures and whether the procedure categories would be combined for an overall facility score.
 - The CORE team clarified that the general surgery measure will not include colonoscopy procedures and will combine the procedure categories while adjusting for procedure complexity and differences in case mix.
- Another TEP member inquired how the measure will handle patients with more than one procedure.
 - The CORE team confirmed that an indicator for the number of performed qualified procedures is typically included as a risk-adjustment variable.
- One TEP member recommended adding an exclusion code or risk-adjustment variable for chronic pain patients.
 - The CORE team assured the TEP members that the team will investigate codes for narcotic and drug use. The measure could exclude unplanned hospital visits for drug seeking from the outcome, exclude chronic pain patients from the measure cohort, or apply a risk-adjustment variable.
- One TEP member agreed with the rationale for excluding endocrine procedures entirely from the cohort. Another TEP member agreed with the recommendation to exclude endocrine procedures.
- One TEP member pointed out the difference in the most common hospital visits after vascular procedures compared to other procedure categories. They suggested that some of the reasons for hospital visits could be complications of renal dialysis grafting, septicemia, and pneumonia. The same TEP member referenced a system, called Prometheus, which categorizes complications into provider- or procedure-related and system- or process-related failures.
 - The CORE team pointed out that the differences in reasons for hospital visits could be due to the procedure or the patient condition, and risk adjustment may help account for patient conditions. The outcome of hospital visits, whether due to the procedure or process, are important to patients. The risk-adjusted measure should incentivize the reduction in complications from both types of outcomes.
- Five TEP members responded and agreed that the outcome of hospital visits within seven days after general surgery procedures reflects quality of care for all procedure categories, except endocrine.
- Summary:
 - TEP members commented on the low volume of facilities and the low outcome rates. TEP members also commented on the approach to risk adjustment, suggesting adjustment for the number of procedures and chronic pain patients. TEP members approved of the recommendation to exclude endocrine

procedures and agreed that the outcome after general surgery procedures, except endocrine, reflects quality of care.

Present Cohort Recommendation

- Key Issues Discussed:
 - CORE presented the cohort recommendation to include procedures within the scope of general surgery training, except endocrine. The recommendation would include a cohort of the following types of procedures:
 - Abdomen
 - Alimentary
 - Breast
 - Skin/soft tissue
 - Wound
 - Vascular
 - Next steps to finalize the cohort include refining the procedure list by excluding endocrine, clinically reviewing individual procedures to confirm whether the outcome provides a good signal of quality, and identifying any staged or planned procedures that should not be captured by the outcome.
- TEP Feedback:
 - One TEP member inquired how the team will confirm that the outcome is a good signal of quality.
 - The CORE team explained that the team will investigate whether the unplanned hospital visit rate is elevated immediately following procedures and whether the reasons for hospital visits are plausibly related to each procedure. Based on TEP input, the CORE team will likely break apart the vascular category and investigate the hospital visit rates and reasons for hospital visits.
- Summary:
 - TEP members agreed with the recommendation to combine general surgery procedures into the measure cohort, except for endocrine.

Next Steps

- Key Issues Discussed:
 - CORE reviewed the measure development next steps, including:
 - Refining the list of procedures;
 - Finalizing risk variables;
 - Testing and finalizing measure risk models;
 - Hosting a public comment period; and
 - Holding the second TEP meeting.
 - The second TEP meeting will likely be held in February or March to review the risk-adjustment model. The TEP members will also review the TEP Summary Report prior to public posting.
- TEP Feedback:
 - None

Follow-up Email Discussion

- Key Issue Discussed:
 - One TEP member reminded the CORE team how important it is to clarify that the measure will provide an ASC-level score because providers within ASC's share responsibility for quality of care and patients' outcomes. In other words, ASC procedures affect quality across providers because they share operating rooms, anesthesia, post-op care, and responsibility for patient education.
- Key Issue Discussed:
 - One TEP member highlighted that the vascular procedures have higher baseline outcome rates compared to the other procedure categories.
 - The CORE team further examined the reasons for hospital visits among subgroups of the vascular procedures. Based on these analyses, the CORE team has tentatively determined that all vascular procedures, except varicose vein procedures, should be excluded from the general surgery cohort because the reasons for hospital visits do not appear to be related to the procedure but rather to patients' underlying comorbidities. Reasons for hospital visits following varicose vein procedures appear related to the ASC procedure rather than patients' underlying comorbidities.

Second TEP Meeting Overview

During the second TEP meeting, CORE presented the final measure specifications, measure testing results, and reviewed the Measure Evaluation Survey (see [Appendix D](#) for Measure Evaluation Survey results). TEP members generally supported the measure specifications with some targeted comments. TEP members asked questions about the inclusion of one risk variable interaction term, the minimum cases threshold for the measure score and reliability testing, and the size of the confidence interval. CORE staff closed the meeting by reviewing the next steps for the development of the measure which include:

- Holding a four-week public comment period in late June or early July, during which the measure specifications will be posted;
- Submitting the measure to CMS's Measures Under Consideration list by June 30th; and
- Submitting the measure to the National Quality Forum (NQF) for endorsement.

Final Measure Specifications

- Key Issues Discussed:
 - The measure population includes Medicare Fee-for-service (FFS) patients who are 65 years or older undergoing outpatient general surgery procedures that are within the scope of general surgery training:
 - Abdominal procedures
 - Alimentary tract procedures
 - Breast
 - Skin/soft tissue
 - Wound

- Varicose vein
- The measure outcome is any hospital visit, including emergency department visits, observation stays, or unplanned inpatient admissions that occur within 7 days of the general surgery ASC procedure. The outcome excludes planned admissions for follow-up of care because these hospital visits are not a signal of quality of care.
- CORE developed the risk variables with input from surgical consultants and the TEP, who reviewed a comprehensive list of candidate risk factors. The final list of risk variables includes the following:
 - Age
 - Twenty comorbidities
 - Number of qualified procedures performed (1 vs. 2 vs. ≥ 3)
 - Work Relative Value Units (RVU), which represents the surgical procedure complexity
 - Procedure type variables
 - Two interaction terms, including RVU*procedure type and other benign tumors*procedure type.
- TEP Feedback:
 - One TEP member inquired whether the Work RVU would be higher with complications that occur during the index admission, similar to the Diagnosis-Related Group (DRG) system.
 - The CORE team explained that the DRG system was not used in this case. Instead, the measure uses the ASC procedure code and procedure RVU. This method is preferable to DRG system since the DRG codes roll up additional information beyond the procedure, which may inadvertently risk adjust for complications or quality signals.
 - Another TEP member pointed out that ASCs are paid based on a Current Procedural Terminology (CPT) code, so the payment for facilities remain the same, regardless of patient complications. This is a different approach from the payment system for hospitals.
 - One TEP member remarked that the odds ratio of the other benign tumors*varicose vein procedures interaction variable had a very high odds ratio of 1.93 and a wide confidence interval (0.64-5.86) and wondered which tumors were clinically associated with varicose vein procedures.
 - CORE explained that this component of the interaction term has a wide confidence interval due to a low case size. The measure fits the interaction term across all six categories of procedures, but some of the procedure types included very few cases. Regarding the clinical significance, the CORE team will discuss the clinical relevance of the interaction term in the risk model and follow up with the TEP offline.
- Summary:
 - TEP members supported the final measure specifications including the measure cohort, measure outcome and the final risk-adjustment variables. The TEP brought up some questions that required further clarification. The CORE team will consider

the clinical relevance of the other benign tumors*varicose vein procedures interaction term and relay this back to the TEP members.

Measure Testing Results

- Key Issues Discussed:
 - CORE used the Calendar Year 2015 100% Medicare FFS claims data to build the patient model and test model performance, which include approximately 150,000 general surgery procedures across more than 3,200 ASCs.
 - The data was randomly split into two samples to test the patient-level model performance: 50% in the Development Sample and 50% in the Validation Sample. The patient-level model results include the following:
 - The c-statistic, which indicates how well the model can distinguish among patients who have and do not have hospital visits, was 0.704, indicating very good discrimination.
 - CORE tested the model performance for patients who were low-, medium-, and high-risk to ensure the model accurately predicted outcomes for each risk level (risk decile). Both the Developmental and Validation Samples predicted approximately 0.7% of hospital visit rates in the lowest-risk decile and approximately 6.5% hospital visit rates in the highest-risk decile. This implies that the model can predict risk across a wide spectrum of patients.
 - The CORE team reviewed the risk decile plots that showed the risk deciles from 1-10 on the x-axis, with higher deciles indicating higher risk; the y-axis represented the hospital visit rates. The observed hospital visit rate was very close to the predicted hospital rate, indicating strong model calibration in different risk deciles.
 - Lastly, CORE tested the model for overfitting, which occurs in models that describe the relationship between the predictor and the outcome very well in the development sample, but fail to provide valid predictions for new patients in the validation sample. For the results of the overfitting index, γ_0 and γ_1 were close to 0 and 1, indicating no evidence of overfitting.
 - The CORE team reviewed the two-level hierarchical logistic regression model, which was used to calculate the measure score for each facility and measure reliability.
 - The measure reliability used four years of Medicare FFS data (2012-2015). CORE randomly split patients into two samples and calculated the measure scores for each facility in the two samples, and then they examined the agreement between the two sets of measure scores by using intra-class correlation coefficient (ICC). The model ICC [2,1] was 0.51, indicating moderate measure score reliability.
 - The CORE team presented the ASC-level measure score variation results, which used two years of Medicare FFS data (2014 & 2015), in a bar graph showing the national distribution of the ASC risk-standardized scores. The risk-standardized hospital visit rate (RSHVR) ranged from 0.94%-4.55%. The distribution showed variation in RSHVRs.

- The CORE team used a conservative 95% confidence interval estimate of RSHVR to identify the following outliers:
 - 11 ASCs were categorized as significantly better than the national average.
 - 15 ASCs were categorized as significantly worse than the national average.
 - 1,625 ASCs were not significantly different from the national average.
- TEP Feedback:
 - One TEP member asked if there was a minimum sample size for each facility and remarked that a small sample size could render the measure score unreliable.
 - The CORE team explained that there was no minimum sample size for score calculation. The hierarchical modeling approach assumes that very small facilities will perform close to the national average. Therefore, the CORE team included all facilities in the analyses, regardless of their sample size, but only reported measure scores for ASCs with at least 25 cases. The interval estimates account for the uncertainty associated with the point estimate when the measure categorizes hospitals into performance categories based on an interval estimates.
 - Another TEP member questioned whether implementing the general surgery measure was valuable to ASCs and stakeholders, given the small number of outliers that the model identified.
 - The CORE team explained that the approach to categorizing performance is very conservative with a 95% confidence interval estimate, and thus does not identify many statistical outliers, and that it is only one part of the measure reporting. CORE noted, that the measure score (the point estimate or risk-standardized rate) provides valuable information, and the measure score will help facilities compare their performance relative to facilities with similar patients. CORE also noted that when reporting similar measures CMS has always provided patient-level data to facilities so they can see how many and which patients seek hospital care within 7 days, and the reasons for hospital visits. Hence, although the approach to classifying ASCs as outliers identifies relatively few facilities as outliers, score reporting will provide useful information for ASCs and consumers.
 - One TEP member recommended using less conservative 90% confidence interval estimate to identify more poor performing ASCs.
 - CORE staff noted that to date all CMS quality measures use a 95% confidence interval.
- Summary:
 - Although some TEP members raised concerns about the minimum sample size for reporting measure scores and the ability of the measures to discern poor performing ASCs, TEP members generally supported the final measure specifications and results.

Next Steps

- The CORE team will reach out to the TEP members regarding the Measure Evaluation Survey. TEP members will be asked to answer the following questions on a scale of 1 (strongly agree) to 6 (strongly disagree):
 1. The risk-standardized hospital visit rates obtained from the 'Hospital Visits after General Surgery Ambulatory Surgical Center Procedures' measure as specified are valid and useful measures of ASC general surgical quality of care.
 2. The risk-standardized hospital visit rates obtained from the 'Hospital Visits after General Surgery Ambulatory Surgical Center Procedures' measure as specified will provide ASCs with information that can be used to improve their quality of care.
- CORE will host a four-week public comment period, review public comments and incorporate measure revisions as needed; and present final measure specifications and results to the TEP following the public comment period.

Follow-up Email Discussion

- Key Issue Discussed:
 - In response to concerns from TEP members about the clinical sensibility of the other benign tumors*procedure type interaction term, the CORE team decided to remove the term and rerun the patient- and facility-level models. CORE shared the new results with the TEP members in an addendum slide deck and provided further clarification about the number of minimum cases used to report the measure results. The CORE team asked TEP members to submit responses to the face validity survey based on the new model.

Appendix A. TEP Roster

Name, Credentials, and Professional Role	Organizational Affiliation, City, State	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Kirk Campbell, MD; Clinical Assistant Professor of Orthopedic Surgery	New York University Hospital for Joint Diseases, New York, NY	No	Yes	No	No	None disclosed
Gary Culbertson, MD, FACS; Surgeon and Medical Director	Iris Surgery Center, Sumter, SC	No	Yes	Yes	No	None disclosed
Martha Deed, PhD; Patient Safety Advocate	Consumers Union Safe Patient Project, Austin, TX	Yes	No	No	No	None disclosed
James Dupree, MD, MPH; Urologist, Health Services Researcher	University of Michigan, Ann Arbor, MI	No	Yes	Yes	No	Yes (Dr. Dupree has a grant from Blue Cross, Blue Shield of Michigan for collaborative quality improvement work)
Nestor Esnaola, MD, MPH, MBA; Professor of Surgery and Associate Director, Cancer Health Disparities and Community Engagement	Fox Chase Cancer Center, Philadelphia, PA	No	Yes	No	No	None disclosed
John Gore, MD, MS; Associate Professor of Urology	University of Washington, Seattle, WA	No	Yes	Yes	No	None disclosed
Lisa Ishii, MD, MHS; Associate Professor and Coordinator for Research and Quality	Johns Hopkins School of Medicine, Baltimore, MD; American Academy of Otolaryngology–Head and Neck Surgery, Alexandria, VA	No	Yes	Yes	Yes	None disclosed
Atul Kamath, MD; Assistant Professor, Department of Orthopedic Surgery; Clinical Educator Director; Attending Surgeon	Perelman School of Medicine at the University of Pennsylvania; Hospital of the University of Pennsylvania, Philadelphia, PA	No	Yes	Yes	No	Yes (Dr. Kamath is on the Speaker Bureau and is a consultant for Zimmer Biomet, DePuy)

Name, Credentials, and Professional Role	Organizational Affiliation, City, State	Consumer Perspective	Clinical Content	Performance Measurement	Coding and Informatics	Conflict of Interest Disclosure
Tricia Meyer, PharmD, MS, FASHP; Regional Director of Pharmacy, Associate Professor in Department of Anesthesiology	Scott & White Medical Center, Temple, TX; Texas A&M University College of Medicine, Temple, TX	No	Yes	No	No	None disclosed
Amita Rastogi, MD, MHA, CHE, MS; Chief Medical Officer	Health Care Incentives Improvement Institute (HCl3), Newtown, CT	No	Yes	Yes	No	None disclosed
Donna Slosburg, RN, BSN, LHRM, CASC; Executive Director	ASC Quality Collaboration, St. Pete Beach, FL	No	No	Yes	No	None disclosed
Julie Thacker, MD, FACS, FASCRS; Associate Professor of Surgery and Medical Director, Evidence Based Perioperative Care; Fellow of the American College of Surgeons	Duke Hospital and Health System; American College of Surgeons; Durham, NC	No	Yes	Yes	No	Yes (Dr. Thacker is President-Elect of the American Society for Enhanced Recovery and is funded for research related to unrestricted educational, society, or national grants)
Thomas Tsai, MD, MPH; General Surgeon and Research Associate	Brigham and Women's Hospital, Boston, MA; Harvard School of Public Health, Boston, MA	No	Yes	No	Yes	None disclosed
Patient	Participation is confidential	Yes	No	No	No	None disclosed
Patient	Participation is confidential	Yes	No	No	No	None disclosed

Appendix B. CORE Measure Development Team

Table B1. Center for Outcomes Research and Evaluation (CORE) Team Members

Name	Role
Faseeha Altaf, MPH	Supporting Project Coordinator
Haikun Bao, PhD	Analytic Lead
Robert Becher, MD, MS	Clinical Investigator
Mayur Desai, PhD, MPH	Health Services Researcher
Elizabeth Drye, MD, SM	Project Director
Harlan Krumholz, MD, SM	Director
Zhenqiu Lin, PhD, MA	Analytics Director
Megan LoDolce, MA	Project Manager
Arena del Mar Morillo, BA	Research Associate
Erica Norton, BS	Research Associate
Craig Parzynski, MS	Supporting Analyst
Danielle Purvis, MPH	Project Coordinator
Jennifer Schwartz, PhD, MPH	Project Lead
Mahnoosh Sharifi, MD, MPH	Health Services Researcher

Table B2. CORE Consultants

Name	Role
Sharon-Lise Normand, MSc, PhD	Statistical Consultant
Sean O'Neill, MD, PhD	Surgical Consultant

The materials within this document do not represent final measure specifications for the General Surgery ASC Measure.

Appendix C. TEP Call Schedule

TEP Meeting #1

Monday, January 9, 2017 – 4:00-6:00PM EST (Location: Teleconference/Webinar)

TEP Meeting #2

Friday, June 9, 2017 – 5:00-6:00PM EST (Location: Teleconference/Webinar)

Appendix D. Detailed Summary: Feedback from Measure Evaluation Survey

14 out of 15 TEP members responded to the post-TEP face validity survey. Provided below is a **summary of all survey responses** from the TEP.

Post-TEP Survey Questions and Responses

CORE requested feedback in a post-TEP survey on whether the TEP members agreed with the following two statements:

“Please rate the following statement on a scale of 1 (strongly agree) to 6 (strongly disagree): The risk-standardized hospital visit rates obtained from the ‘Hospital Visits after General Surgery Ambulatory Surgical Center Procedures’ measure as specified are valid and useful measures of ASC general surgical quality of care.”

- 7 out of 14 respondents strongly agreed
- 4 out of 14 respondents moderately agreed
- 1 out of 14 respondents somewhat agreed
- 2 out of 14 respondents moderately disagreed

“Please rate the following statement on a scale of 1 (strongly agree) to 6 (strongly disagree): The risk-standardized hospital visit rates obtained from the ‘Hospital Visits after General Surgery Ambulatory Surgical Center Procedures’ measure as specified will provide ASCs with information that can be used to improve their quality of care.”

- 8 out of 14 respondents strongly agreed
- 1 out of 14 respondents moderately agreed
- 3 out of 14 respondents somewhat agreed
- 2 out of 14 respondents moderately disagreed

TEP Comments

- One TEP member felt that a reliability score of 0.53 did not warrant confidence in the measure’s ability to determine risk for procedures for patients 65 and older.
- Two TEP members did not believe that the measure is very strong because the measure uses a conservative confidence interval to identify variation in ASC performance.
- One TEP member expressed concern about the variability of risk variables included in the risk models across the ASC measures, which include the urology, orthopedic, and general surgery measures. The TEP member explained that there is not a clear clinical reason for the diversity of each model, despite the clinical overlap in procedures performed by urologists and general surgeons.

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