Measure Worksheet (MEW-PA-New)

Partnership for Quality Measurement

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Brief Measure Information

CBE #: 3687e

Corresponding Measures: N/A

Measure Title: ePC-07 Severe Obstetric Complications

Measure Steward: The Joint Commission

sp.02. Brief Description of Measure: Hospital-level measure scores are calculated as a risk-adjusted proportion of the number of delivery hospitalizations for women who experience a severe obstetric complication, as defined by the numerator, by the total number of delivery hospitalizations in the denominator during the measurement period. The hospital-level measure score will be reported as a rate per 10,000 delivery hospitalizations.

ePC07 was developed in collaboration with Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE).

1b.01. Developer Rationale: The United States experiences higher rates of maternal morbidity and mortality than most other developed countries. These rates have continued to trend upward in recent decades.1 Research indicates that the overall rate of severe maternal morbidity (SMM) has increased by almost 200% between 1993 and 2014 to 144 per 10,000 delivery hospitalizations1, with more than 25,000 women per year experiencing obstetric complications.2 Recent maternal mortality data from 2018 reveal that 658 women died from maternal causes, resulting in a rate of 17.4 deaths per 100,000 live births, with 77% of the deaths attributed to direct obstetric causes like hemorrhage, preeclampsia, obstetric embolism, and other complications.3 This has prompted national health experts and organizations to prioritize quality improvement strategies to mitigate risk of adverse outcomes among maternal populations. The U.S. Department of Health & Human Services (HHS) has also called for action to improve maternal health and outcomes and outlines seven actions for healthcare professionals, including participating in quality improvement and safety initiatives.4 There are currently only a small number of quality measures focused on maternal health, and those implemented at the national level are mostly process measures and limited in scope. While these existing measures aim to promote coordination of care and standardize health care processes, maternal health outcome measures are sorely needed. Measures such

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as this Severe Obstetric Complications eCQM that are focused on maternal health outcomes will address the patient safety priority area under CMS' Meaningful Measures 2.0 framework, and the use of EHR data for quality measurement addresses interoperability, another CMS Meaningful Measures area for assessing quality of health care.5 1. Centers for Disease Control and Prevention. Severe Maternal Morbidity in the United States. January 31, 2020; https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html. 2. U.S. Department of Health & Human Services. HHS Outlines New Plans and a Partnership to Reduce U.S. Pregnancy-related Deaths. 2020; https://www.hhs.gov/about/news/2020/12/03/hhs-outlines-new-plans-to-reduce-us-pregnancy-related-deaths.html. 3. Hoyert DL, Miniño AM. Maternal mortality in the United States: changes in coding, publication, and data release, 2018. 2020. 4. U.S. Department of Health & Human Services. The Surgeon General's Call to Action to Improve Maternal Health. 2020. 5. Centers for Medicare & Medicaid Services. Meaningful Measures 2.0: Moving from Measure Reduction to Modernization. 2020; https://www.cms.gov/meaningful-measures-20-moving-measure-reduction-modernization, 2020.

sp.12. Numerator Statement: Inpatient hospitalizations for patients with severe obstetric complications including the following:
 	
• Severe maternal morbidity diagnoses (see list below)
• Severe maternal morbidity procedures (see list below)
• Discharge disposition = expired
 	
Severe Maternal Morbidity Diagnoses:
 	
• Cardiac
  ○ Acute heart failure
  ○ Acute myocardial infarction
  ○ Aortic aneurysm
  ○ Cardiac arrest/ventricular fibrillation
  ○ Heart failure/arrest during procedure or surgery
 	
• Hemorrhage
  ○ Disseminated intravascular coagulation

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- Shock

- Renal
  - Acute renal failure

- Respiratory
  - Adult respiratory distress syndrome
  - Pulmonary edema

- Sepsis

- Other OB
  - Air and thrombotic embolism
  - Amniotic fluid embolism
  - Eclampsia
  - Severe anesthesia complications

- Other Medical
  - Puerperal cerebrovascular disorder
  - Sickle cell disease with crisis

Severe Maternal Morbidity Procedures:

- Blood transfusion
- Conversion of cardiac rhythm
- Hysterectomy
- Temporary tracheostomy
- Ventilation

sp.14. Denominator Statement: Initial Patient Population: Inpatient hospitalizations for patients age >= 8 years and < 65 admitted to the hospital for inpatient acute care who undergo a delivery procedure with a discharge date that ends during the measurement period

Denominator: Inpatient hospitalizations for patients delivering stillborn or live birth with >= 20 weeks, 0 days gestation completed

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sp.16. Denominator Exclusions: Patients with confirmed diagnosis of COVID with COVID-related respiratory condition or patients with confirmed diagnosis of COVID with COVID-related respiratory procedure.
Measure Type: Outcome; Electronic Clinical Quality Measure (eCQM) **sp.28. Data Source:** Electronic Health Data; Electronic Health Records **sp.07. Level of Analysis:** Facility
IF Endorsement Maintenance—Original Endorsement Date: N/A **Most Recent Endorsement Date:** N/A
IF this measure is included in a composite, Composite#/title: N/A **IF this measure is paired/grouped, CBE#/title:** N/A **sp.03. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results?**
Staff Assessment: New Measure
Criterion 1: Importance to Measure and Report
1a. Evidence
1a. Evidence. The evidence requirements for a ***health outcome*** measure include providing empirical data that demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service; if these data not available, data demonstrating wide variation in performance can be used, assuming the data are from a robust number of providers and the results are not subject to systematic bias. For measures derived from a patient report, the evidence also should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful.

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The developer provides the following description for this measure:

- This is a new outcome eCQM at the facility-level that calculates hospital-level measure scores as a risk-adjusted proportion of the number of delivery hospitalizations for women who experience a severe obstetric complication, as defined by the numerator, and by the total number of delivery hospitalizations in the denominator during the measurement period. The hospital-level measure score will be reported as a rate per 10,000 delivery hospitalizations.
- The developer provides a logic model that depicts hospital assessment of delivering persons for factors associated with maternal morbidity and mortality which leads to monitoring the rate of severe maternal complications/mortality. These two actions result in hospitals reviewing severe obstetric complication cases and incorporating quality improvement practices which ultimately leads to the reduction in severe obstetric outcomes and improved quality of life for obstetric patients and babies.

Summary:

- The developer presents empirical data from journal articles and Maternal Mortality Review Committees to show the following:
  - Data suggest that a large portion of maternal mortality can be avoided. A 2022 report from 36 maternal mortality review committees determined that 84 percent of obstetric maternal deaths were preventable. Another study found that 40.5 percent of pregnancy-related deaths were preventable (Geller et al, 2004).
  - Data suggest much of severe maternal morbidity is similarly avoidable. A study found that 45.5 percent of near-miss morbidity and 16.7 percent of other severe morbidities were preventable (Geller et al, 2004).
- Areas that the accountable entity can impact for prevention of pregnancy-related morbidity/mortality include: assessment/point of entry to care, diagnosis and recognition of high risk, referral to experts, treatment, management hierarchy, education, communication, policies and procedures, documentation and discharge (Geller et al, 2004).
- This measure was previously submitted during the spring 2022 cycle to the Perinatal and Women's Health (PWH) standing committee for initial endorsement. The PWH committee originally recommended the measure for endorsement through an offline vote as quorum was lost during the spring 2022 measure evaluation meeting. The PWH overturned its decision during the post-comment meeting, which resulted in the developer submitting a reconsideration request to the Consensus Standards Approval Committee (CSAC) positing that the process and NQF criteria were not followed. The CSAC upheld the developer's reconsideration request, noting that the evaluation committee stick to the evidence presented within the measure. If other evidence is submitted for consideration, the committee should ensure that the evidence reflects the measure's specifications.

Question for the Standing Committee:

- *Is there at least one thing that the provider can do to achieve a change in the measure results?*

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Guidance From the Evidence Algorithm Measure assesses performance on a health outcome -> Yes, Developer provides a relationship between the measured outcome and at least one healthcare action -> Yes -> Rate as PASS
Preliminary rating for evidence: ☒ **Pass** ☐ **No Pass**
1b. Gap in Care/Opportunity for Improvement and Disparities

1b. Performance Gap. The performance gap requirements include demonstrating quality problems and opportunity for improvement.
 	
• Data for 30 hospitals were used for 2020 discharges using a rate per 10,000 deliveries, and includes both mortality and morbidity.
  ○ The mean risk adjusted severe obstetric complications rate was 254 (standard deviation [SD] of 55). The other reported rates were as follows:
  ▪ Min: 166
  ▪ 25th percentile: 218
  ▪ 50th percentile: 245
  ▪ 75th percentile: 292
  ▪ Max: 374
• The developer supports these data with data from the literature showing that the United States (U.S.) experiences higher rates of severe obstetric complications than most other developed countries. The overall rate of severe maternal morbidity (SMM) has increased by almost 200 percent between 1993 and 2014 to 144 per 10,000 delivery hospitalizations. The U.S. Department of Health and Human Services has called for action to improve maternal health outcomes, including participation in quality improvement and safety initiatives.

Disparities • The developer presents a study that states women who identify as racial and ethnic minority groups are at a significantly higher risk for developing severe obstetric complications than non-Hispanic White women. • Using their testing data, the developer found that when adjusting for risk factors, Non-Hispanic African-American women have a significantly increased risk (18 percent) of having any SMM compared to non-Hispanic White women, while Hispanic

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women had a significantly increased risk (41 percent) and Non-Hispanic Asian/Pacific Islander women had a significantly increased risk (62 percent) for any SMM.

- When excluding blood transfusion-only cases, compared to non-Hispanic White women, non-Hispanic African-American women had a 6 percent increased risk of SMM, while Hispanic women had a 36 percent increased risk and non-Hispanic Asian/Pacific Islander women had a 43 percent increased risk.
- When compared to private insurance, Medicaid and Medicare covered beneficiaries also showed an increased risk when adjusting for risk factors for any SMM and SMM excluding blood transfusion-only cases.

Questions for the Standing Committee:

- *Is there a gap in care that warrants a national performance measure?*

Preliminary rating for opportunity for improvement:
☐ **High** ☒ **Moderate** ☐ **Low** ☐ **Insufficient**

RATIONALE: [Rationale for voting low or insufficient]

Criteria 2: Scientific Acceptability of Measure Properties – NOTE: TESTING NOT SUBMITTED, AS THE DEVELOPER HAS SUBMITTED THIS MEASURE FOR TRIAL USE. Per NQF Criteria, measure testing is not required for Trial Use measures.

Complex measure evaluated by the Scientific Methods Panel (SMP)? ☐ **Yes** ☒ **No**

Evaluators: Battelle staff

2a. Reliability: Specifications and Testing

2a1. Specifications require the measure, as specified, to produce consistent (i.e., reliable) and credible (i.e., valid) results about the quality of care when implemented.

- The submitted measure specification follows established technical specifications for electronic clinical quality measures (eCQMs) (Quality Data Model [QDM], health quality measure format [HQMF], and Clinical Quality Language [CQL]) as indicated in subcriterion 2a1.
- The submitted measure specification is fully represented and is not hindered by any limitations in the established technical specifications for eCQMs.

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2a2. Reliability testing demonstrates whether the measure data elements are repeatable and producing the same results a high proportion of the time when assessed in the same population in the same time period, and/or whether the measure score is precise enough to distinguish differences in performance across providers.
Specifications: • Measure specifications are clear and precise. • This eCQM is specified using the latest industry-accepted eCQM technical specifications: HQMF, QDM, CQL, and value sets vetted through the National Library of Medicine's (NLM) Value Set Authority Center (VSAC).
Reliability Testing: • NOTE: TESTING NOT SUBMITTED, AS THE DEVELOPER HAS SUBMITTED THIS MEASURE FOR TRIAL USE. Per NQF Criteria, measure testing is not required for Trial Use measures.
Questions for the Standing Committee regarding reliability: • *Are the measure specifications clear and precise?*
2b. Validity: Validity Testing; Exclusions; Risk Adjustment; Meaningful Differences; Comparability; Missing Data
2b2. Validity testing should demonstrate that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality.

2b2-2b6. Potential threats to validity
 	
Validity Testing
• NOTE: TESTING NOT SUBMITTED, AS THE DEVELOPER HAS SUBMITTED THIS MEASURE FOR TRIAL USE. Per NQF Criteria, measure testing is not required for Trial Use measures
• Feasibility testing was conducted at 9 test sites, representing 3 different EHR vendor systems.
• The Feasibility Scorecard indicated that none of the measure data elements present significant issues with accuracy.
• Data elements:
  • Hospital Name
  • Organization HCO ID
  • Medical Record Number
  • Encounter ID
  • Patient Characteristic Birthdate: Birth date
  • Patient Characteristic: Sex

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• Patient Characteristic: Race • Patient Characteristic: Ethnicity • Patient Characteristic: Payer • Encounter, Performed: Encounter Inpatient • Encounter, Performed: Encounter Inpatient, Relevant Period startTime • Encounter, Performed: Encounter Inpatient, Relevant Period stopTime • Encounter, Performed: Emergency Department Visit • Encounter, Performed: Emergency Department Visit, Relevant Period startTime • Encounter, Performed: Emergency Department Visit, Relevant Period stopTime • Encounter, Performed: Observation Services • Encounter, Performed: Observation Services, Relevant Period startTime • Encounter, Performed: Observation Services, Relevant Period stopTime • *Encounter Performed, Admission Source • Encounter Performed, Discharge Disposition • Encounter Performed, Facility location ICU • Encounter Performed, Facility location ICU, location period startTime • Encounter Performed, Facility location ICU, location period stopTime • Encounter Performed, Diagnosis • Encounter Performed, Diagnosis, Present On Admission Indicator • Procedure, Performed: Conversion of Cardiac Rhythm • Procedure, Performed: Hysterectomy • Procedure, Performed: Tracheostomy • Procedure, Performed: Ventilation • Procedure, Performed: Delivery Procedures • Blood Product Transfusion • Blood Product Transfusion, Relevant Period startTime • Blood Product Transfusion, Relevant Period stopTime • Assessment, Performed: Estimated Gestational Age at Delivery, relevantDatetime • Assessment, Performed: Estimated Gestational Age at Delivery, result • Assessment, Performed: Delivery date Estimated, relevant Datetime • Assessment, Performed: Delivery date Estimated, result

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• Assessment, Performed: Date and time of obstetric delivery, relevantDatetime • Assessment, Performed: Date and time of obstetric delivery, result • Laboratory Test, Performed, Result dateTime Creatinine • Laboratory Test, Performed, Result Creatinine • Laboratory Test, Performed, Result dateTime Platelets • Laboratory Test, Performed, Result Platelets • *Laboratory Test, Performed, Result dateTime *Hemoglobin • *Laboratory Test, Performed, Result *Hemoglobin • *Laboratory Test, Performed, Result dateTime *Hematocrit • *Laboratory Test, Performed, Result *Hematocrit • *Laboratory Test, Performed, Result dateTime *White blood cell count (WBC) • *Laboratory Test, Performed, Result *White blood cell count (WBC) • *Laboratory Test, Performed, Result dateTime *Bicarbonate • *Laboratory Test, Performed, Result *Bicarbonate • *Laboratory Test, Performed, Result dateTime *Glucose • *Laboratory Test, Performed, Result *Glucose • *Physical Exam, Performed, Result dateTime *O2 Saturation • *Physical Exam, Performed, Result *O2 Saturation • *Physical Exam, Performed, Result dateTime *Heart rate • *Physical Exam, Performed, Result *Heart rate • *Physical Exam, Performed, Result dateTime *Systolic blood pressure • *Physical Exam, Performed, Result *Systolic blood pressure • *Physical Exam, Performed, Result dateTime *Respiratory rate • *Physical Exam, Performed, Result *Respiratory rate • *Physical Exam, Performed, Result dateTime *Temperature • *Physical Exam, Performed, Result *Temperature
Criterion 3. Feasibility
3. Feasibility is the extent to which the specifications, including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

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- Using a simulated data set, the submission demonstrates that the evaluation of 100 percent of the measure logic can be automated.
- Across the 9 pilot test sites, feasibility rates (that is, the percentage of data elements found to be available, accurate, coded to a nationally accepted terminology standard, and collected as part of normal clinical workflow) ranged from 94% to 100%, with an average overall feasibility score of 98%.

Questions for the Standing Committee:

- *Are the required data elements available in electronic form (e.g., EHR or other electronic sources)?*
- *Is the data collection strategy ready to be put into operational use?*

Preliminary rating for feasibility: ☐ **High** ☒ **Moderate** ☐ **Low** ☐ **Insufficient**

Criterion 4: Use and Usability

4a. Use (4a1. Accountability and Transparency; 4a2. Feedback on measure)

4a. Use evaluates the extent to which audiences (e.g., consumers, purchasers, providers, and policymakers) use or could use performance results for both accountability and performance improvement activities.

4a1. Accountability and Transparency. Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If they are not in use at the time of initial endorsement, then a credible plan for implementation within the specified time frames is provided.

Current uses of the measure

Publicly reported?	☒ Yes	☐ No	
Current use in an accountability program?	☒ Yes	☐ No	☐ UNCLEAR
Planned use in an accountability program?	☐ Yes	☒ No	☐ N/A

Accountability program details

- This measure is used in the ORYX Performance Measure Reporting: Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program, implemented by The Joint Commission.
    - These programs also provide quality improvement data with both internal and external benchmarking. The data submitted is analyzed by The Joint Commission for trends and benchmarks and for internal quality improvement purposes.

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• This measure is also used within Centers for Medicare & Medicaid Services (CMS) quality reporting programs
4a.2. Feedback on the measure by those being measured or others. Three criteria demonstrate feedback: (1) Those being measured have been given performance results or data, as well as assistance with interpreting the measure results and data; (2) Those being measured, and other users have been given an opportunity to provide feedback on the measure performance or implementation; and (3) This feedback has been considered when changes are incorporated into the measure.
Feedback on the measure provided by those being measured or others • After the pilot testing concluded and final results were analyzed, a pilot summary report was created and shared with each pilot site via email. • The Joint Commission developed dashboards as part of the ongoing continuous customer engagement project. The dashboard report, posted in the Resources and Tools section of an accredited hospital's secure Joint Commission Connect® extranet site, is representative of each organization's relative performance on each of the selected measures. • A webinar was held in December 2022 where a live demo, review of the measure specifications and logic were presented, and a live Q&A were available. • Feedback was obtained during a public comment period for those being measured. Commenters provided support for focusing measurement on addressing severe maternal morbidity and improving maternal health outcomes, the usefulness of this measure in assessing and improving the quality of care for patients, publicly reporting both an overall rate of severe obstetric complications and a rate of severe obstetric complications excluding blood transfusion-only cases, and exclusion of patients diagnosed with COVID-19. There was mixed support for the use of SNOMED codes. • Feedback was obtained from a TEP and patient working group. Experts and patients expressed that this is an important health outcome measure with room for improvement and it would distinguish between hospital performance.
Questions for the Standing Committee: • *How can the performance results be used to further the goal of high quality, efficient healthcare?* • *How has the measure been vetted in real-world settings by those being measured or others?*
Preliminary rating for Use: ☒ **Pass** ☐ **No Pass**
4b. Usability (4b1. Improvement; 4b2. Benefits of measure)
4b. Usability evaluates the extent to which audiences (e.g., consumers, purchasers, providers, and policymakers) use or could use performance results for both accountability and performance improvement activities.
4b1 Improvement. Progress toward achieving the goal of high quality, efficient healthcare for individuals or populations is demonstrated.

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Improvement results • As this is a new measure, performance improvement data is not yet available.
4b2. Benefits versus harms. The benefits of the performance measure in facilitating progress toward achieving high quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists). **Unexpected findings (positive or negative) during implementation** • There are no implementation findings at this time. **Potential harms** • The developer notes that measuring obstetric complications may cause a shift in hospital resources to support EHR data extraction and reporting and away from other functions. Also, hospitals may potentially focus on complications in the measure while dismissing other complications not currently measured.

Additional Feedback:
• This measure was reviewed by the Measure Applications Partnership (MAP) for the Interoperability and Inpatient Quality Reporting (IQR) programs in 2021. The MAP recommended conditional support for rulemaking in both programs pending the successful completion of testing and CBE endorsement.
  ○ The MAP's rationale for conditional support in the interoperability program was that this measure provides meaningful use of certified electronic health record technology and that it would be the only measure in the Interoperability program addressing maternal health and obstetric complications if included.
  ○ MAP's rational for this measure's conditional support in the IQR program was it would be the only outcome measure in Hospital IQR that directly measures morbidity and obstetric complications.
• For both programs, MAP raised concerns about the sample size used for testing in the measure.

Questions for the Standing Committee: • *How can the performance results be used to further the goal of high quality, efficient healthcare?* • *Do the benefits of the measure outweigh any potential unintended consequences?*
Preliminary rating for Usability and Use: ☐ **High** ☒ **Moderate** ☐ **Low** ☐ **Insufficient**

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Criterion 5: Related and Competing Measure
Related Measures • No related or competing measures identified.
Harmonization • N/A

QUALITY MEASURE SUBMISSION FORM
Version: 1.0; Generated: 13 April 2023
SUBMITTED FOR TRIAL USE

Introduction

Thank you for your interest in submitting a measure to Battelle for possible endorsement.

What criteria are used to evaluate measures? Measures are evaluated on standardized criteria: importance to measure and report, scientific acceptability of measure properties, feasibility, usability and use, and related and competing measures. For your measure to be evaluated against these measure evaluation criteria, you must complete the measure submission form.

Why do I have to complete a form? Due to the volume and/or complexity of proposed measures, Battelle provides measure information to committee reviewers in a standardized format to facilitate their evaluation of whether the measure meets the measure evaluation criteria. This form allows the measure steward to present information demonstrating that the proposed measure meets endorsement criteria.

What is on the form? The information requested in this form is directly related to the measure evaluation criteria.

Can't I just submit our files for consideration? No. Measures must be submitted through the online form to be considered for the Spring 2023 cycle. Requested information should be entered directly into this form and as well as any necessary or required attachments.

Can I submit additional details and materials? Additional materials will be considered only as supplemental. Do NOT rely on material provided in an appendix to provide measure specifications or to demonstrate meeting the criteria. The core information needed to evaluate the measure should be provided in the appropriate submission form fields and required attachments. Please contact PQMsupport@battelle.org regarding questions about submitting supplemental materials.

What do I do first? If you have started a new submission by answering five qualifying questions, you may proceed to the “Previous Submission Information" tab to continue with your submission. The “Conditions” tab will list the conditions that must be met before your proposed measures may be considered and evaluated for suitability as endorsed voluntary consensus standards. You are asked to acknowledge reading and accepting the conditions.

Can I make changes to a form once I have submitted it? No. Once you submit your

measure, you will NOT be able to return to this submission form to make further revisions. You will need to contact project staff.

What if I need additional help? Please contact the project staff at PQMsupport@battelle.org if you have questions regarding the information requested or submitting supplemental materials.

NOTE: All measure submissions should be 508-compliant. Refer to the Checklist for Developer 508 Guidelines (PDF) to ensure all guidelines apply to all parts of your submission, including all fields and attachments used within the measure submission form.

Please email us at PQMsupport@battelle.org if you experience technical difficulties using the online submission form.

Thank you for your interest in submitting measures to Battelle.

Previous Submission Information (1 – 4)

1) Select whether this measure was previously submitted to the prior consensus-based entity (the National Quality Forum [NQF]) and given an identifying number.

☒ Previously submitted to NQF
☐ New measure, never submitted.

2) Provide the measure number of the previously submitted measure.

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3) If the measure has an electronic clinical quality measure (eCQM) version, provide the measure number of the previously submitted measure.

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4) If this eCQM has a registry version, provide the measure numbers of the previously submitted measure.

Conditions (1 - 2)

Several conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards. If any of the conditions are not met, the measure will not be accepted for consideration.

A. A Measure Steward Agreement is signed or the steward is a government organization. (All non-government organizations must sign a Measure Steward Agreement.) For more information about completing a Measure Steward Agreement, please go to: Endorsement | Partnership for Quality Measurement (p4qm.org) and follow the instructions.

B. The measure owner/steward verifies there is an identified responsible entity and a process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every three years.

C. The intended use of the measure includes both accountability applications (including public reporting) and performance improvement to achieve high-quality, efficient healthcare.

D. The measure is fully specified and tested for reliability and validity.

E. The measure developer/steward attests that harmonization with related measures and issues with competing measures have been considered and addressed, as appropriate.

F. The requested measure submission information is complete and responsive to the questions so that all the information needed to evaluate all criteria is provided.

1) Check if either of the following apply.

☐ Proprietary measure or components (e.g., risk model, codes)
☐ Proprietary measure or components with fees
☒ None of the above

2) Check the box below to agree to the conditions listed above.

☒ I have read and accept the conditions as specified above

Specifications: Maintenance Update (spma.01 - spma.02)

Section N/A for Trial Use

spma.01) Indicate whether there are changes to the specifications since the last updates/submission. If yes, update the specifications in the Measure Specifications section of the Measure Submission Form, and explain your reasoning for the changes below.

☐ No
☐ Yes

spma.02) Briefly describe any important changes to the measure specifications since the last measure update and provide a rationale.

For annual updates, please explain how the change in specifications affects the measure results. If a material change in specification is identified, data from re-testing of the measure with the new specifications is required for early maintenance review.

For example, specifications may have been updated based on suggestions from a previous measure endorsement review.

Measure Specifications (sp.01 - sp.32)

sp.01) Provide the measure title.

Measure titles should be concise yet convey who and what is being measured.

ePC-07 Severe Obstetric Complications

sp.02) Provide a brief description of the measure.

Including type of score, measure focus, target population, timeframe, (e.g., Percentage of adult patients aged 18-75 years receiving one or more HbA1c tests per year).

Hospital-level measure scores are calculated as a risk-adjusted proportion of the number of delivery hospitalizations for women who experience a severe obstetric complication, as defined by the numerator, by the total number of delivery hospitalizations in the denominator during the measurement period. The hospital-level measure score will be reported as a rate per 10,000 delivery hospitalizations.

ePC07 was developed in collaboration with Yale New Haven Health Services Corporation/Center for Outcomes Research and Evaluation (CORE).

sp.03) Provide a rationale for why this measure must be reported with other measures to appropriately interpret results.

Not applicable

sp.04) Check all the clinical condition/topic areas that apply to your measure, below.

☐ Behavioral Health
☐ Behavioral Health: Alcohol, Substance Use/Abuse
☐ Behavioral Health: Anxiety
☐ Behavioral Health: Attention Deficit Hyperactivity Disorder (ADHD)
☐ Behavioral Health: Bipolar Disorder
☐ Behavioral Health: Depression
☐ Behavioral Health: Domestic Violence
☐ Behavioral Health: Other Serious Mental Illness
☐ Behavioral Health: Post-Traumatic Stress Disorder (PTSD)
☐ Behavioral Health: Schizophrenia
☐ Behavioral Health: Suicide
☐ Cancer
☐ Cancer: Bladder

- ☐ Cancer: Breast
- ☐ Cancer: Colorectal
- ☐ Cancer: Gynecologic
- ☐ Cancer: Hematologic
- ☐ Cancer: Liver
- ☐ Cancer: Lung, Esophageal
- ☐ Cancer: Prostate
- ☐ Cancer: Renal
- ☐ Cancer: Skin
- ☐ Cancer: Thyroid
- ☐ Cardiovascular
- ☐ Cardiovascular: Arrythmia
- ☐ Cardiovascular: Congestive Heart Failure
- ☐ Cardiovascular: Coronary Artery Disease
- ☐ Cardiovascular: Coronary Artery Disease (AMI)
- ☐ Cardiovascular: Coronary Artery Disease (PCI)
- ☐ Cardiovascular: Hyperlipidemia
- ☐ Cardiovascular: Hypertension
- ☐ Cardiovascular: Secondary Prevention
- ☐ Critical Care
- ☐ Critical Care: Assisted Ventilation
- ☐ Critical Care: Intensive Monitoring
- ☐ Dental
- ☐ Dental: Caries
- ☐ Dental: Tooth Loss
- ☐ Ears, Nose, Throat (ENT)
- ☐ Ears, Nose, Throat (ENT): Ear Infection
- ☐ Ears, Nose, Throat (ENT): Hearing
- ☐ Ears, Nose, Throat (ENT): Pharyngitis
- ☐ Ears, Nose, Throat (ENT): Tonsilitis
- ☐ Endocrine
- ☐ Endocrine: Calcium and Metabolic Bone Disorders
- ☐ Endocrine: Diabetes
- ☐ Endocrine: Female and Male Endocrine Disorders
- ☐ Endocrine: Hypothalamic-Pituitary Disorders
- ☐ Endocrine: Thyroid Disorders
- ☐ Eye Care
- ☐ Eye Care: Age-related macular degeneration (AMD)
- ☐ Eye Care: Cataracts
- ☐ Eye Care: Diabetic retinopathy

- ☐ Eye Care: Glaucoma
- ☐ Gastrointestinal (GI)
- ☐ Gastrointestinal (GI): Constipation
- ☐ Gastrointestinal (GI): Gall Bladder Disease
- ☐ Gastrointestinal (GI): Gastroenteritis
- ☐ Gastrointestinal (GI): Gastro-Esophageal Reflux Disease (GERD)
- ☐ Gastrointestinal (GI): Hemorrhoids
- ☐ Gastrointestinal (GI): Hernia
- ☐ Gastrointestinal (GI): Inflammatory Bowel Disease
- ☐ Gastrointestinal (GI): Irritable Bowel Syndrome
- ☐ Gastrointestinal (GI): Peptic Ulcer
- ☐ Genitourinary (GU)
- ☐ Genitourinary (GU): Benign Prostatic Hyperplasia
- ☐ Genitourinary (GU): Erectile Dysfunction/Premature Ejaculation
- ☐ Genitourinary (GU): Incontinence/pelvic floor disorders
- ☐ Genitourinary (GU): Prostatitis
- ☐ Genitourinary (GU): Urinary Tract Injection (UTI)
- ☐ Gynecology (GYN)
- ☐ Gynecology (GYN): Abnormal bleeding
- ☐ Gynecology (GYN): Endometriosis
- ☐ Gynecology (GYN): Infections
- ☐ Gynecology (GYN): Menopause
- ☐ Gynecology (GYN): Pelvic Pain
- ☐ Gynecology (GYN): Uterine fibroids
- ☐ Infectious Diseases (ID)
- ☐ Infectious Diseases (ID): HIV/AIDS
- ☐ Infectious Diseases (ID): Influenza
- ☐ Infectious Diseases (ID): Lyme Disease
- ☐ Infectious Diseases (ID): Meningococcal Disease
- ☐ Infectious Diseases (ID): Pneumonia and respiratory infections
- ☐ Infectious Diseases (ID): Sepsis
- ☐ Infectious Diseases (ID): Sexually Transmitted
- ☐ Infectious Diseases (ID): Tuberculosis
- ☐ Liver
- ☐ Liver: Viral Hepatitis
- ☐ Musculoskeletal
- ☐ Musculoskeletal: Falls and Traumatic Injury
- ☐ Musculoskeletal: Gout
- ☐ Musculoskeletal: Joint Surgery
- ☐ Musculoskeletal: Low Back Pain

☐ Musculoskeletal: Osteoarthritis
☐ Musculoskeletal: Osteoporosis
☐ Musculoskeletal: Rheumatoid Arthritis
☐ Neurology
☐ Neurology: Alzheimer's Disease
☐ Neurology: Autism
☐ Neurology: Brain Injury
☐ Neurology: Epilepsy
☐ Neurology: Migraine
☐ Neurology: Parkinson's Disease
☐ Neurology: Spinal Cord Injury
☐ Neurology: Stroke/Transient Ischemic Attack (TIA)
☐ Other (please specify here:)
☐ Palliative Care and End-of-Life Care
☐ Palliative Care and End-of-Life Care: Advanced Directives
☐ Palliative Care and End-of-Life Care: Amyotrophic Lateral Sclerosis (ALS)
☐ Palliative Care and End-of-Life Care: Hospice Management
☐ Palliative Care and End-of-Life Care: Inappropriate use of acute care services
☐ Palliative Care and End-of-Life Care: Pain Management
☒ Perinatal Health
☒ Perinatal Health: Labor and Delivery
☐ Perinatal Health: Newborn Care
☒ Perinatal Health: Post-Partum Care
☐ Perinatal Health: Preconception Care
☐ Perinatal Health: Prenatal Care
☐ Renal
☐ Renal: Acute Kidney Injury
☐ Renal: Chronic Kidney Disease (CKD)
☐ Renal: End Stage Renal Disease (ESRD)
☐ Renal: Infections
☐ Reproductive Health
☐ Reproductive Health: Family planning and contraception
☐ Reproductive Health: Infertility
☐ Reproductive Health: Male reproductive health
☐ Respiratory
☐ Respiratory: Acute Bronchitis
☐ Respiratory: Allergy
☐ Respiratory: Asthma
☐ Respiratory: Chronic Obstructive Pulmonary Disease (COPD)
☐ Respiratory: Dyspnea

☐ Respiratory: Pneumonia
☐ Respiratory: Sleep Apnea
☐ Surgery
☐ Surgery: Cardiac Surgery
☐ Surgery: Colorectal
☐ Surgery: Neurosurgery / Spinal
☐ Surgery: Orthopedic
☐ Surgery: Orthopedic Hip/Pelvic Fractures
☐ Surgery: Pediatric
☐ Surgery: Perioperative and Anesthesia
☐ Surgery: Plastic
☐ Surgery: Thoracic Surgery
☐ Surgery: Trauma
☐ Surgery: Vascular Surgery

sp.05) Check all the non-condition specific measure domain areas that apply to your measure, below.

☐ Access to Care
☐ Care Coordination
☐ Care Coordination: Readmissions
☐ Care Coordination: Transitions of Care
☐ Disparities Sensitive
☐ Health and Functional Status
☐ Health and Functional Status: Change
☐ Health and Functional Status: Nutrition
☐ Health and Functional Status: Obesity
☐ Health and Functional Status: Physical Activity
☐ Health and Functional Status: Quality of Life
☐ Health and Functional Status: Total Health
☐ Immunization
☐ Other (please specify here:)
☐ Person-and Family-Centered Care: Person-and Family-Centered Care
☐ Person-and Family-Centered Care: Workforce
☐ Primary Prevention
☐ Primary Prevention: Nutrition
☐ Primary Prevention: Tobacco Use
☐ Safety
☒ Safety: Complications
☐ Safety: Healthcare Associated Infections

☐ Safety: Medication
☐ Safety: Overuse
☐ Screening

sp.06) Select one or more target population categories.

Select only those target populations which can be stratified in the reporting of the measure's result.

☐ Adults (Age >= 18)
☐ Children (Age < 18)
☐ Elderly (Age >= 65)
☐ Populations at Risk: Dual eligible beneficiaries of Medicare and Medicaid
☐ Populations at Risk: Individuals with multiple chronic conditions
☐ Populations at Risk: Veterans
☒ Women

sp.07) Select the levels of analysis that apply to your measure.

Check ONLY the levels of analysis for which the measure is SPECIFIED and TESTED.

☐ Accountable Care Organization
☐ Clinician: Group/Practice
☐ Clinician: Individual
☒ Facility
☐ Health Plan
☐ Integrated Delivery System
☐ Other (please specify here:)
☐ Population: Community, County or City
☐ Population: Regional and State

sp.08) Indicate the care settings that apply to your measure.

Check ONLY the settings for which the measure is SPECIFIED and TESTED.
☐ Ambulatory Care
☐ Behavioral Health
☐ Home Care
☒ Inpatient/Hospital
☐ Other (please specify here:)
☐ Outpatient Services
☐ Post-Acute Care

sp.09) Provide a Uniform Resource Locator (URL) link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials.

Do not enter a URL linking to a home page or to general information. If no URL is available, indicate "none available".

The specifications are posted at https://ecqi.healthit.gov/ecqm/eh/2023/cms1028v1

sp.10) Indicate whether Health Quality Measure Format (HQMF) specifications are attached.

Attach the zipped output from the measure authoring tool (MAT) for eCQMs - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications).

☒ *HQMF specifications are attached.*

☐ HQMF specifications are NOT attached (Please explain).

Attachment: 3687e_CMS1028v1.zip

sp.11) Attach the simulated testing attachment.

All eCQMs require a simulated testing attachment to confirm that the HTML output from Bonnie testing (or testing of some other simulated data set) includes 100% coverage of measured patient population testing, with pass/fail test cases for each sub-population. This can be submitted in the form of a screenshot.

☒ Testing is attached
☐ Testing is NOT attached (please explain)

Attachment: 3687e_PC07 Bonnie Results Stratification-Alt.pdf
Attachment: 3687e_PC07 Bonnie Results_Alt.pdf

sp.12) Attach the data dictionary, code table, or value sets (and risk model codes and coefficients when applicable). Excel formats (.xlsx or .csv) are preferred.

Attach an excel or csv file; if this poses an issue, contact staff at PQMsupport@battelle.org. Provide descriptors for any codes. Use one file with multiple worksheets, if needed.

☒ Available in attached Excel or csv file
☐ No data dictionary/code table – all information provided in the submission form

Attachment: 3687e_ValueSets.xlsx

For the question below: state the outcome/process being measured. Calculations of the risk-adjusted outcome measures should be described in sp.22.

sp.13) State the numerator.

Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome).

DO NOT include the rationale for the measure.

Inpatient hospitalizations for patients with severe obstetric complications including the following:

- Severe maternal morbidity diagnoses (see list below)
- Severe maternal morbidity procedures (see list below)
- Discharge disposition = expired

Severe Maternal Morbidity Diagnoses:

- Cardiac
    - Acute heart failure
    - Acute myocardial infarction
    - Aortic aneurysm
    - Cardiac arrest/ventricular fibrillation
    - Heart failure/arrest during procedure or surgery
- Hemorrhage
    - Disseminated intravascular coagulation
    - Shock
- Renal

- Acute renal failure

- Respiratory
  - Adult respiratory distress syndrome
  - Pulmonary edema

- Sepsis
- Other OB
  - Air and thrombotic embolism
  - Amniotic fluid embolism
  - Eclampsia
  - Severe anesthesia complications

- Other Medical
  - Puerperal cerebrovascular disorder
  - Sickle cell disease with crisis

Severe Maternal Morbidity Procedures:

- Blood transfusion
- Conversion of cardiac rhythm
- Hysterectomy
- Temporary tracheostomy
- Ventilation

For the question below: describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.14) Provide details needed to calculate the numerator.

All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets.

Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

1. The QDM datatype of Encounter Performed, Diagnosis evaluates the Severe Maternal Morbidity Diagnoses value set (2.16.840.1.113762.1.4.1029.255) to see if a code is present on the encounter. If so, the Encounter, Performed, PresentOnAdmission Indicator datatype evaluates the Present on Admission = No or Unable to Determine value set (2.16.840.1.113762.1.4.1029.370) and the numerator will be met if the code has a POA code of "No" or "Unable to Determine".

2. The QDM datatype of Procedure, Performed evaluates the Severe Maternal Morbidity Procedures value set (2.16.840.1.113762.1.4.1029.256) and the Blood Transfusion value set (2.16.840.1.113762.1.4.1029.213) to see if a code is present with a corresponding procedure date anytime during the hospitalization encounter. The Blood Transfusion value set is kept separate from the other procedures so that the rates can be stratified with and without blood transfusion.

3. The QDM datatype of Encounter, Performed, Discharge Disposition evaluates the Patient Expired value set (2.16.840.1.113883.3.117.1.7.1.309) to determine if the patient expired during the encounter.

If any one of the 3 conditions above are met, the patient will be in the numerator. To access the value sets for the measure, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at https://vsac.nlm.nih.gov/. A list of value sets for the measure is attached in the Excel workbook provided for question sp.12.

For the question below: state the target population for the outcome. Calculation of the risk-adjusted outcome should be described in sp.22.

sp.15) State the denominator.

Brief, narrative description of the target population being measured.

Initial Patient Population: Inpatient hospitalizations for patients age >= 8 years and < 65 admitted to the hospital for inpatient acute care who undergo a delivery procedure with a discharge date that ends during the measurement period

Denominator: Inpatient hospitalizations for patients delivering stillborn or live birth with >= 20 weeks, 0 days gestation completed

For the question below: describe how the target population is identified. Calculation of

the risk-adjusted outcome should be described in sp.22.

sp.16) Provide details needed to calculate the denominator.

All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets.

Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

For patients meeting the initial patient population:

1. The logic determines calculated gestational age (CGA) as follows:
    a. For the Estimated Due Date (EDD), the QDM datatype Assessment, Performed: Delivery date Estimated using Delivery date Estimated LOINC Direct Reference Code 11778-8 is used. To assure the most up to date EDD is used the logic looks for the last EDD 42 weeks or less before or on delivery.

    b. For the Date of Delivery, the QDM datatype Assessment, Performed: Date and time of obstetric delivery using Date and time of obstetric delivery LOINC Direct Reference Code 93857-1 is used. To assure the most accurate date/time of delivery the logic looks for the last assessment of date/time of delivery during the encounter. To account for deliveries that may occur outside of the inpatient encounter, the logic looks at the expanded encounter including any Emergency Department, Observation or OB Triage visits within one hour of the inpatient admission.

    c. The logic includes a function which calculates the gestational age. This function reflects the ACOG (American College of Obstetrics and Gynecology) ReVITALize Guidelines for Calculating Gestational Age (CGA):

    Gestational Age = (280-(EDD minus Reference Date))/7

    Reference Date is the date on which you are trying to determine gestational age. For purposes of this eCQM, Reference Date would be the Date of Delivery.

2. If the necessary elements are not available to calculate CGA, CGA will be null. Then the estimated gestational age, which is derived from the QDM datatype Assessment, Performed: Estimated Gestational Age at Delivery using SNOMEDCT Value Set (2.16.840.1.113762.1.4.1045.26) is used.

3. Gestational age >= 20 weeks, 0 days will meet the logic.

4. Lastly, the QDM datatype of Procedure, Performed evaluates Procedure, Performed: Delivery Procedures (2.16.840.1.113762.1.4.1045.59) to determine if a delivery code is present. The delivery procedure codes do not distinguish live from stillborn deliveries.

sp.17) Describe the denominator exclusions.

Brief narrative description of exclusions from the target population.

Patients with confirmed diagnosis of COVID with COVID-related respiratory condition or patients with confirmed diagnosis of COVID with COVID-related respiratory procedure.

sp.18) Provide details needed to calculate the denominator exclusions.

All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at sp.11.

A denominator exclusion for COVID plus respiratory conditions was added post pilot due to the growing evidence of perinatal complications in women who have COVID infection with respiratory conditions. Patients with confirmed diagnosis of COVID with COVID-related respiratory condition or patients with confirmed diagnosis of COVID with COVID-related respiratory procedure are excluded.

1. The QDM datatype of Encounter Performed, Diagnosis evaluates the COVID 19 Confirmed value set (2.16.840.1.113762.1.4.1029.373) to see if a code is present on the encounter.

AND

2. The QDM datatype of Encounter Performed, Diagnosis evaluates the COVID 19 Related Respiratory Conditions value set (2.16.840.1.113762.1.4.1029.376) to see if a code is present on the encounter OR the QDM datatype of Procedure Performed evaluates COVID 19 Related Respiratory Procedures (2.16.840.1.113762.1.4.1029.379) and that the procedure starts during the encounter.

sp.19) Provide all information required to stratify the measure results, if necessary.

Include the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically adjusted version of the measure when appropriate. Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format in the Data Dictionary field.

A subset of the numerator population will be reported in Stratification as Stratum 1: Nontransfusion only severe obstetric complications (excluding cases where transfusion was the only severe obstetric complication)

Calculation:

(Risk-standardized number of encounters with nontransfusion only severe obstetric complications (excluding cases where transfusion was the only severe obstetric complication) / Number of encounters in Denominator) * 10,000

The logic includes a definition entitled: "Delivery Encounter Greater Than Or Equal To 20 Weeks Gestation Completed With Severe Obstetric Complications (Excluding Blood Transfusions)". This definition unions the following 2 definitions:

- "Delivery Encounter Greater Than Or Equal To 20 Weeks Gestation Completed With Severe Obstetric Complications Diagnosis or Procedure (Excluding Blood Transfusion)"
- Union "Delivery Encounter Greater Than Or Equal To 20 Weeks Gestation Completed With Expiration"

The first definition includes patients with a Severe Obstetric Complication Diagnosis or a procedure indicative of severe obstetric complication (other than blood transfusion) as described in the numerator. Cases with blood transfusions are not excluded from this definition if they have another SOC. Thereby, patients who only had a SOC of blood transfusion would not qualify for Stratum 1.

sp.20) Is this measure adjusted for socioeconomic status (SES)?

☐ Yes
☒ No

sp.21) Select the risk adjustment type.

Select type. Provide specifications for risk stratification and/or risk models in the Scientific Acceptability section.

☐ No risk adjustment or risk stratification
☒ Statistical risk model

There are 34 risk factors in the risk model. The measure is not adjusted for SES; however, it does adjust for Economic Housing Instability.

☐ Stratification by risk category/subgroup (specify number of risk factors)
☐ Other approach to address risk factors (please specify here:)

sp.22) Select the most relevant type of score.

Attachment: If available, please provide a sample report.

☐ Categorical, e.g., yes/no
☐ Continuous variable, e.g. average
☐ Count

☐ Frequency Distribution
☐ Non-weighted score/composite/scale
☐ Other (please specify here:)
☒ Rate/proportion
☐ Ratio
☐ Weighted score/composite scale

sp.23) Select the appropriate interpretation of the measure score.

Classifies interpretation of score according to whether better quality or resource use is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score.

☐ Better quality = Higher score
☒ Better quality = Lower score
☐ Better quality = Score within a defined interval
☐ Passing score defines better quality

sp.24) Diagram or describe the calculation of the measure score as an ordered sequence of steps.

Identify the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period of data, aggregating data; risk adjustment; etc.

Please see the attached zip file with the HQMF specifications for the complete measure logic in response to question sp.10. Additionally, a flow diagram of the denominator, denominator exclusions, and numerator logic is attached to the NQF submission form as a supplemental document.

sp.25) Attach a copy of the instrument (e.g. survey, tool, questionnaire, scale) used as a data source for your measure, if available.

☐ Copy of instrument is attached.
☒ Copy of instrument is NOT attached (please explain).

Not applicable

sp.26) Indicate the responder for your instrument.

Not applicable

☐ Patient
☐ Family or other caregiver
☐ Clinician
☐ Other (specify)

sp.27) If measure testing is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.

Examples of samples used for testing:

• Testing may be conducted on a sample of the accountable entities (e.g., hospital, physician). The analytic unit specified for the particular measure (e.g., physician, hospital, home health agency) determines the sampling strategy for scientific acceptability testing.

• The sample should represent the variety of entities whose performance will be measured. The samples used for reliability and validity testing often have limited generalizability because measured entities volunteer to participate. Ideally, however, all types of entities whose performance will be measured should be included in reliability and validity testing.

• The sample should include adequate numbers of units of measurement and adequate numbers of patients to answer the specific reliability or validity question with the chosen statistical method.

• When possible, units of measurement and patients within units should be randomly selected.

No sampling.

sp.28) Identify whether and how proxy responses are allowed.

Not applicable

sp.29) Survey/Patient-reported data.

Provide instructions for data collection and guidance on minimum response rate. Specify calculation of response rates to be reported with performance measure results.

Not applicable

sp.30) Select only the data sources for which the measure is specified.

☐ Assessment Data
☐ Claims
☒ Electronic Health Data
☒ Electronic Health Records
☐ Instrument-Based Data
☐ Management Data

☐ Other (please specify here:)
☐ Paper Medical Records
☐ Registry Data

sp.31) Identify the specific data source or data collection instrument.

For example, provide the name of the database, clinical registry, collection instrument, etc., and describe how data are collected.

Not applicable

sp.32) Provide the data collection instrument.

☐ Available at measure-specific web page URL identified in sp.09
☐ Available in attached appendix in Question 1 of the Additional Section
☒ No data collection instrument provided

Importance to Measure and Report: Maintenance of Endorsement (1ma.01)

Section N/A for Trial Use

1ma.01) Indicate whether there is new evidence about the measure since the most recent maintenance evaluation. If yes, please briefly summarize the new evidence, and ensure you have updated entries in the Evidence section as needed.

☐ Yes
☐ No

Not applicable

Importance to Measure and Report: Evidence (Complete for Outcome Measures) (1a.01 - 1a.03)

Please separate added or updated information from the most recent measure evaluation within each question response in the Importance to Measure and Report: Evidence section. For example:

Current Submission:

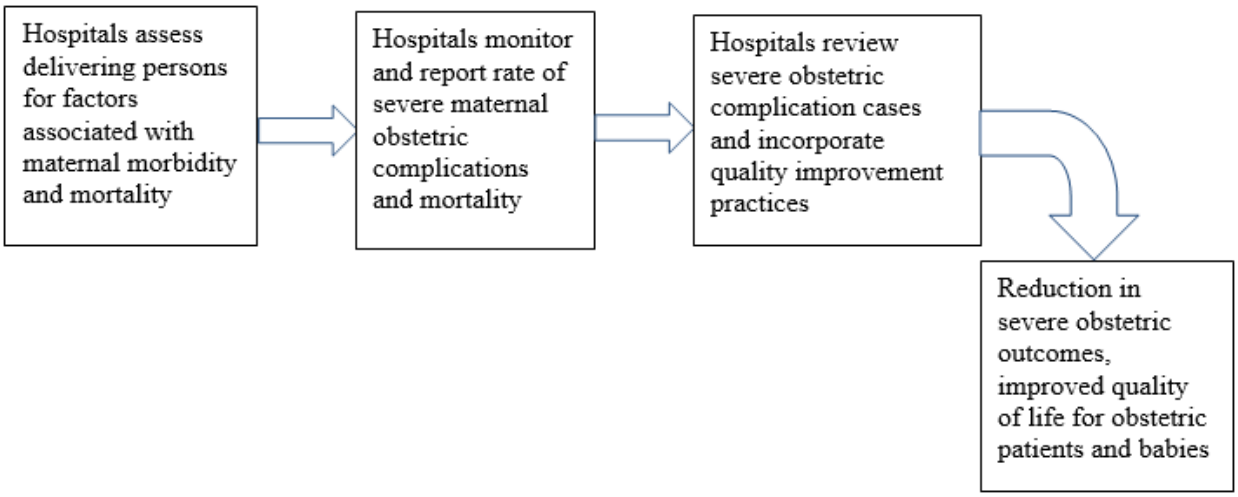
Updated evidence information here.

Previous (Year) Submission:

Evidence from the previous submission here.

1a.01) Provide a logic model.

Briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient's health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.



The goal for this measure is to assess the occurrence of specific severe obstetric complications in the hospital setting by using a methodology that reliably allows comparison across hospitals. Reduction in maternal complications will reduce maternal death and disability and improve maternal quality of life. The Severe Obstetric Complication electronic clinical quality measure (eCQM) is expected to inform hospital efforts to improve maternal health outcomes and thus reduce the costs associated with adverse

health outcomes. The measure specifications are harmonized with other perinatal measures (for cohort alignment) and a modified version of the Center for Disease Control and Prevention's (CDC's) 21 indicators of severe maternal morbidity (SMM) (for harmonization of the measure outcome) which includes the use of POA indicators for inclusion/exclusion in the numerator population and risk adjustment for broad applicability across hospitals.

1a.02) Provide evidence that the target population values the measured outcome, process, or structure and finds it meaningful.

Describe how and from whom input was obtained.

To gain targeted input from the patient and caregiver perspective, a Patient Working Group was recruited through collaboration with Rainmakers Strategic Solutions LLC. The Patient Working Group was composed of seven members, including patients and caregivers with diverse experiences and perspectives. The first Patient Working Group meeting was held in August 2020 via web-based webinar during which Patient Working Group members provided input on initial measure specifications for the measure cohort, outcome and risk adjustment. The second meeting was held in July 2021 via web-based webinar, at which Patient Working Group members provided input on measure specification updates, as well as feasibility testing and reliability results and initial validity testing results. At the third meeting, a web-based webinar held in November 2021, Patient Working Group members provided input on the risk adjustment model, measure scores, and further testing results.

Five members of the Patient Working Group (PWG) completed the face validity surveys with two of the five statements. All five Patient Working Group members strongly agreed with the first statement ("The severe obstetric morbidity and mortality captured by the Severe Obstetric Complications eCQM is an important health outcome to measure because it is an area with room for improvement"). The second statement ("The risk standardized rate of severe obstetric morbidity and mortality events obtained from the Severe Obstetric Complications eCQM as specified is a critical component (that is, necessary but not all-inclusive) of defining and comparing quality of obstetric care between hospitals") was rated by all respondents as strongly (n=3)/moderately agree (n=2). These results demonstrate that the PWG believes this is an important health outcome to measure because there is room for improvement and the rate is a critical component of defining and comparing quality of obstetric care between hospitals.

The Working Group members provided personal and insightful perspectives on key measure aspects of measure development and decisions. The members strongly believe this eCQM is an important health outcome to measure because there is room for improvement and strongly/moderately agree that this measure is a critical component of defining and comparing the quality of obstetric care between hospitals.

1a.03) Provide empirical data demonstrating the relationship between the outcome (or PRO) and at least one healthcare structure, process, intervention, or service.

The high maternal mortality and morbidity rates in the United States present unique opportunities for large-scale quality measurement and improvement activities. Statistics on preventability vary but

suggest that a considerable proportion of maternal mortality and morbidity events could be prevented. A 2022 report from maternal mortality review committees in 36 states conducting a thorough review of pregnancy-related deaths determined that 84% of deaths were preventable (Data from 36 U.S. Maternal Mortality Review Committees, 2017-2019).1 Additionally, a study that examined preventability of pregnancy-related death, women with near-miss morbidity, and those with severe morbidity found that 40.5% of deaths, 45.5% of near miss morbidity, and 16.7% of other severe morbidities were preventable.2 Geller et. al. identified areas of focus for preventability of morbidity and mortality included assessment/point of entry to care, diagnosis and recognition of high risk, referral to experts, treatment, management hierarchy, education, communication, policies and procedures, documentation, and discharge.

[1] Trost SL, Beauregard J, Njie F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017-2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.

[2]Geller SE, Rosenberg D, Cox SM, et al. The continuum of maternal morbidity and mortality: factors associated with severity. *American journal of obstetrics and gynecology.* 2004;191(3):939-944.

Importance to Measure and Report: Evidence (Complete for Process Measures) (1a.03 - 1a.16)

Section N/A for Trial Use

Please separate added or updated information from the most recent measure evaluation within each question response in the Importance to Measure and Report: Evidence section. For example:

Current Submission:

Updated evidence information here.

Previous (Year) Submission:

Evidence from the previous submission here.

1a.01) Provide a logic model.

Briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient's health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

1a.02) Select the type of source for the systematic review of the body of evidence that supports the performance measure.

A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data.

☐ Clinical Practice Guideline recommendation (with evidence review)
☐ US Preventive Services Task Force Recommendation
☐ Other systematic review and grading of the body of evidence (e.g., Cochrane Collaboration, AHRQ Evidence Practice Center)
☐ Other (please specify here:)

If the evidence is not based on a systematic review, skip to the end of the section and do not complete the repeatable question group below. If you wish to include more than one systematic review, you may add additional tables to the relevant sections. Please follow the 508 Checklist for tables.

Evidence - Systematic Reviews Table (Repeatable)

1a.03) Provide the title, author, date, citation (including page number) and URL for the systematic review.

1a.04) Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the systematic review.

1a.05) Provide the grade assigned to the evidence associated with the recommendation and include the definition of the grade.

1a.06) Provide all other grades and definitions from the evidence grading system.

1a.07) Provide the grade assigned to the recommendation, with definition of the grade.

1a.08) Provide all other grades and definitions from the recommendation grading system.

1a.09) Detail the quantity (how many studies) and quality (the type of studies) of the evidence.

1a.10) Provide the estimates of benefit, and consistency across studies.

1a.11) Indicate what, if any, harms were identified in the study.

1a.12) Identify any new studies conducted since the systematic review, and indicate whether the new studies change the conclusions from the systematic review.

Evidence

1a.13) If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, describe the evidence on which you are basing the performance measure.

1a.14) Briefly synthesize the evidence that supports the measure.

1a.15) Detail the process used to identify the evidence.

1a.16) Provide the citation(s) for the evidence.

Importance to Measure and Report: Gap in Care/Disparities (1b.01 - 1b.05)

1b.01) Briefly explain the rationale for this measure.

Explain how the measure will improve the quality of care and list the benefits or improvements in quality envisioned by use of this measure.

The United States experiences higher rates of maternal morbidity and mortality than most other developed countries. These rates have continued to trend upward in recent decades.1 Research indicates that the overall rate of severe maternal morbidity (SMM) has increased by almost 200% between 1993 and 2014 to 144 per 10,000 delivery hospitalizations1, with more than 25,000 women per year experiencing obstetric complications.2 Recent maternal mortality data from 2018 reveal that 658 women died from maternal causes, resulting in a rate of 17.4 deaths per 100,000 live births, with 77% of the deaths attributed to direct obstetric causes like hemorrhage, preeclampsia, obstetric embolism, and other complications.3 This has prompted national health experts and organizations to prioritize quality improvement strategies to mitigate risk of adverse outcomes among maternal populations. The U.S. Department of Health & Human Services (HHS) has also called for action to improve maternal health and outcomes and outlines seven actions for healthcare professionals, including participating in quality improvement and safety initiatives.4 There are currently only a small number of quality measures focused on maternal health, and those implemented at the national level are mostly process measures and limited in scope. While these existing measures aim to promote coordination of care and standardize health care processes, maternal health outcome measures are sorely needed. Measures such as this Severe Obstetric Complications eCQM that are focused on maternal health outcomes will address the patient safety priority area under CMS' Meaningful Measures 2.0 framework, and the use of EHR data for quality measurement addresses interoperability, another CMS Meaningful Measures area for assessing quality of health care.5

1. Centers for Disease Control and Prevention. Severe Maternal Morbidity in the United States. January 31, 2020; https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html.

2. U.S. Department of Health & Human Services. HHS Outlines New Plans and a Partnership to Reduce U.S. Pregnancy-related Deaths. 2020; https://www.hhs.gov/about/news/2020/12/03/hhs-outlines-new-plans-to-reduce-us-pregnancy-related-deaths.html.

3. Hoyert DL, Miniño AM. Maternal mortality in the United States: changes in coding, publication, and data release, 2018. 2020.

4. U.S. Department of Health & Human Services. The Surgeon General's Call to Action to Improve Maternal Health. 2020.

5. Centers for Medicare & Medicaid Services. Meaningful Measures 2.0: Moving from Measure Reduction to Modernization. 2020; https://www.cms.gov/meaningful-measures-20-moving-measure-reduction-modernization, 2020.

1b.02) Provide performance scores on the measure as specified (current and over time) at the specified level of analysis.

Include mean, std dev, min, max, interquartile range, and scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.

There are a limited number of pilot hospitals, so the five-number statistical summaries are used in place of the scores by deciles. Data for 30 hospitals are summarized in Table 1b.02.01 at the hospital level for delivery hospitalizations discharged in 2020 using a rate per 10,000 deliveries. Maternal morbidity data in literature is reported as rates per 10,000 and maternal mortality rates are reported per 100,000. The Severe Obstetric Complications rate for both measure outcomes includes both maternal morbidity and mortality occurring during the delivery hospitalization encounter and is reported as a rate per 10,000. The median number of encounters was 831 per hospital site.

Table 1b.02.01 Risk- adjusted Hospital Level Rates

Statistic	Outcome 1: Any Severe Obstetric Complication(s)	Outcome 2: Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters
Mean	254, SD: 55	54, SD: 5
Min	166	49
25th Percentile	218	52
50th Percentile	245	53
75th Percentile	292	55
Max	374	72

Risk-adjusted rates per 10,000 on this measure

Table 1b.02.01 displays the statistical measurements of the risk-adjusted hospital level rates. See above paragraph for specific details.

For reference, each health system will be referred to as a 'pilot site' and 'hospital' will refer to the individual hospitals within the health system. A total of 10 pilot sites, consisting of 28 hospitals were included in some phase of stage 1 Beta pilot testing. 5 additional hospitals were included in Stage 2 Beta pilot testing. Stage 1 beta pilot testing sites have numerical site ID, and stage 2 sites have alphabetical site ID.

Table 1b.02.02 Pilot Site Characteristics

Site ID	# Of Hospitals	Geography (Urban, Suburban, Rural)	# Total Beds[a]	# Of Births[a]	Teaching Program in OB/GYN	NICU Level	Clinical EHR Software
Site 1	10	Urban	1,800 (range 36 - 740)	16,350 + (range 450 – 5,550)[b]	No	Level 2 Level 3 Level 4	Epic
Site 2	1	Urban	250	8,800	No	Level 4	Cerner/ Siemens
Site 3	1	Urban	250	8,300	No	Level 3	Meditech
Site 4[c]	2	Urban	450	2,900	No	Level 2 Level 3	Cerner
Site 5	9	6 Urban 3 Rural	1,650 (range 35 - 595)	9,300 + (range 150– 3,400)[b]	No	Level 3 (1 central NICU for all hospitals)	Epic
Site 6	1	Urban	450	3,300	No	Level 3	Meditech
Site 7	1	Urban	550	4,650	Yes	Level 3	Epic
Site 8[d]	1	Urban	650	2,450	Yes	Level 3	Epic
Site 9	1	Urban	400	3,850	No	Level 3	Epic
Site 10[e]	1	Urban	300	8,800	Yes	Level 3	Cerner
Hospital A	1	Urban	150	800	No	Level 1	Epic
Hospital B	1	Urban	1,250	3,600	Yes	Level 2	Epic
Hospital C	1	Urban	450	3,600	Yes	Level 2	Epic
Hospital D	1	Urban	50	900	No	Level 1	Epic
Hospital E	1	Rural	100	400	No	NA	Meditech

[a] *The number of total beds and number of births have been rounded to the nearest 50 to maintain confidentiality of the hospitals*

[b] *Not all hospitals within this site reported number of births, so total births across site is higher than indicated*

[c] *Test Site 4 declined continued participation after Alpha Testing*

[d] *Data from Test Site 8 was not available in time for Beta Testing*

[e] *Test Site 10 joined after Alpha Testing*

Table 1b.02.02 displays the characteristics of the entities measured. The information was retrieved from the American Hospital Association (AHA) DataQuery ™ product, or from hospitals directly.

1b.03) If no or limited performance data on the measure as specified is reported above, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement. Include citations.

The United States experiences higher rates of maternal morbidity and mortality than most other developed countries. These rates have continued to trend upward in recent decades. Research indicates that the overall rate of severe maternal morbidity (SMM) has increased by almost 200% between 1993 and 2014 to 144 per 10,000 delivery hospitalizations1, with more than 25,000 women per year experiencing obstetric complications.2 Statistics on preventability vary but suggest that a considerable proportion of maternal mortality and morbidity events could be prevented. 1.Data from 36 U.S. Maternal Mortality Review Committees from 2017-2019 determined that 84% of maternal deaths were preventable. Additionally, a study that examined preventability of pregnancy-related death, women with near-miss morbidity, and those with severe morbidity found that 40.5% of deaths, 45.5% of near miss morbidity, and 16.7% of other severe morbidities were preventable. 2. Recent maternal mortality data from 2018 reveal that 658 women died from maternal causes, resulting in a rate of 17.4 deaths per 100,000 live births, with 77% of the deaths attributed to direct obstetric causes like hemorrhage, preeclampsia, obstetric embolism, and other complications.3

1. Centers for Disease Control and Prevention. Severe Maternal Morbidity in the United States. January 31, 2020; https://www.cdc.gov/reproductivehealth/maternalinfanthealth/severematernalmorbidity.html.

2. U.S. Department of Health & Human Services. HHS Outlines New Plans and a Partnership to Reduce U.S. Pregnancy-related Deaths. 2020; https://www.hhs.gov/about/news/2020/12/03/hhs-outlines-new-plans-to-reduce-us-pregnancy-related-deaths.html.

3. Trost SL, Beauregard J, Njie F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017-2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.

1b.04) Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability.

Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included. Include mean, std dev, min, max, interquartile range, and scores by decile. For measures that show high levels of performance, i.e., “topped out”, disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b) under Usability and Use.

Disparities data are presented for race/ethnicity, for payor, and for age. For race/ethnicity and for payor, data on risk ratios are provided (Table 1b.04.01 for race/ethnicity, and Table 1b.04.03 payor), as well as unadjusted outcome rates (Table 1b.04.02 for race/ethnicity, and Table 1b.04.04 for payor). Risk ratios were not calculated using age, as age is included in the measure’s risk model; Table 1b.04.05 provides data on unadjusted outcome rates by age.

[Risk ratios were calculated using the risk variables in the risk model. Risk factor variables included in the risk adjustment model are as follows:

• Demographics and patient characteristics: maternal age
• Preexisting conditions and pregnancy characteristics defined by ICD-10 codes

o Anemia
o Asthma
o Autoimmune disease
o Bariatric surgery
o Bleeding disorder
o Body Mass Index (BMI)
o Cardiac disease
o Gastrointestinal disease
o Gestational diabetes
o Human Immunodeficiency Virus (HIV)
o Hypertension
o Mental health disorder
o Multiple pregnancy
o Neuromuscular disease
o Obstetric venous thromboembolism (VTE)
o Other pre-eclampsia
o Placental accreta spectrum
o Placental abruption
o Placenta previa
o Preexisting diabetes
o Preterm birth
o Previous cesarean
o Pulmonary hypertension
o Renal disease
o Severe pre-eclampsia
o Substance abuse
o Thyrotoxicosis

• Laboratory tests and vital signs upon hospital arrival (Hematocrit, White blood cell [WBC] count, Heart rate, Systolic blood pressure)

• Long-term anticoagulant medication use

• Social Risk Factors: economic/housing instability]

When adjusting for risk factors, Non-Hispanic - African American women have an 18% increased risk of having any SMM compared to non-Hispanic-white women, while Hispanic women had a 41% increased risk, and Non-Hispanic-Asian/Pacific Islander women had a 62% increased risk for any SMM. When excluding blood transfusion only cases, compared to Non-Hispanic-White women, there was a 6% increased risk for Non-Hispanic African American, 36% increased risk for Hispanic, and a 43% increased risk for Non-Hispanic-Asian/Pacific Islander women. When compared to private insurance, Medicaid and

Medicare payors also showed an increased risk when adjusting for risk factors for any SMM and SMM excluding blood transfusion only cases.

Table 1b.04.01 and 1b.04.02 represents 30 hospitals data from stage 1 and stage 2 beta testing.

Table 1b.04.01 Race/Ethnicity Adjustment Rate Ratios

Variable	Prevalence of risk factors n (%)	Any SOC Adjusted rate ratio (95% CI)	SOC excluding blood transfusion only cases Adjusted rate ratio (95% CI)
Race/Ethnicity	*	*	*
Non-Hispanic - White	39,060 (56.6%)	*	*
Declined/Unknown	1.985 (2.9%)	1.03 (0.75, 1.41)	1.25 (0.67, 2.33)
Hispanic	8,807 (12.8%)	1.41 (1.19, 1.67)	1.37 (0.96, 1.97)
Non-Hispanic - African American	14,218 (20.6%)	1.18 (1.03, 1.36)	1.06 (0.77, 1.46)
Non-Hispanic - Asian/Pacific Islander	3,246 (4.7%)	1.62 (1.25, 2.09)	1.43 (0.82, 2.50)
Non-Hispanic - Other	1,702 (2.5%)	1.15 (0.81, 1.63)	0.71 (0.28, 1.79)

NA: Not available due to small count

*Cells intentionally left blank

Table 1b.04.01 displays risk-adjustment rate ratios divided among race/ethnicity. The prevalence rate is provided and the rate ratio for any SOC and SOC excluding blood transfusion only cases.

Table 1b.04.02 Unadjusted Measure Rates per 10,000 by Race/Ethnicity Category

Race/Ethnicity	N	Any Severe Obstetric Complication(s)	Any Severe Obstetric Complication(s)	Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters	Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters
*	*	Outcomes	Outcome Rate (95% CI) Unadjusted	Outcomes	Outcome Rate (95% CI) Unadjusted
Unique Encounters	69018	1719	249.07 (237.44, 260.69)	376	54.48 (48.99, 59.97)
Declined/unknown	1755	45	256.41 (182.46, 330.36)	11	62.68 (25.75, 99.60)
Hispanic	8807	220	249.80 (217.21, 282.40)	44	49.96 (35.24, 64.69)
Non-Hispanic - African American	14218	515	362.22 (331.51, 392.93)	99	69.63 (55.96, 83.30)
Non-Hispanic - American Indian or Alaska Native	156	3	192.31 (0.00, 407.82)[a]	1	64.10 (0.00, 189.34)[a]
Non-Hispanic - Asian/Pacific Islander	3246	83	255.70 (201.40, 310.00)	19	58.53 (32.29, 84.78)
Non-Hispanic - Declined/unknown	230	4	173.91 (4.97, 342.86)	1	43.48 (0.00, 128.51)[a]
Non-Hispanic - Other/ Multiple	1546	33	213.45 (141.41, 285.50)	4	25.87 (0.55, 51.20)
Non-Hispanic - White	39060	816	208.91 (194.73, 223.09)	197	50.44 (43.41, 57.46)

a. Confidence intervals with negative lower limits were replaced with zero

* Cells intentionally left blank

Table 1b.04.02 displays unadjusted measure rates per 10,000 for each race/ethnicity category. The highest unadjusted rates for both outcomes are seen among non-Hispanic Black or African American race/ethnicity.

Table 1b.04.03 Payer Risk Adjustment Rate Ratios

Variable	Prevalence of risk factors n (%)	Any SOC Adjusted rate ratio (95% CI)	SOC excluding blood transfusion only cases Adjusted rate ratio (95% CI)
Payer	*	*	*
Private Insurance	41,066 (68.2%)	*	*
Medicaid	16,221 (27.0%)	1.20 (1.05, 1.37)	1.13 (0.84, 1.50)
Medicare	223 (0.4%)	1.56 (0.87, 2.79)	1.47 (0.51, 4.24)
Other	2,518 (4.2%)	1.09 (0.82, 1.44)	0.89 (0.46, 1.72)
Self-pay or Uninsured	149 (0.2%)	0.47 (0.11, 1.98)	NA

NA: Not available due to small count

*Cells intentionally left blank

Table 1b.04.03 displays risk-adjustment rate ratios divided among payers for the 25 hospitals in stage 1 beta testing. Only aggregate payor data was available for stage 2 beta testing. The prevalence rate is provided and the rate ratio for any SOC and SOC excluding blood transfusion only cases.

Table 1b.04.04 Unadjusted Measure Rates per 10,000 by Payer Category

Payer	rate	n
Private Insurance	208.9	41506
Medicaid	346.6	17888
Medicare	592.3	287
Other	223.4	3670
Self-pay or Uninsured	136.1	147

Table 1b.04.04 displays the unadjusted measure rates per 10,000 by payer category for the 25 hospitals in stage 1 beta testing. Only aggregate payor data was available for stage 2 beta testing. The n is also displayed by payer category. The highest unadjusted rates are among Medicare and Medicaid payers.

Table 1b.04.05 Unadjusted Measure Rates per 10,000 by Age Category

Age	N	Any Severe Obstetric Complication(s) - Observed Rate per 10,000	Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters – Observed Rate per 10,000
<20	1977	328.78	55.64
20-25	9961	309.21	44.17

Age	N	Any Severe Obstetric Complication(s) - Observed Rate per 10,000	Severe Obstetric Complication(s) Excluding Blood Transfusion-Only Encounters – Observed Rate per 10,000
25-30	17949	239.01	54.04
30-35	23100	209.96	51.52
35-40	12934	239.68	56.44
40+	3097	393.93	103.33

Table 1b.04.05 displays the unadjusted measure rates per 10,000 for each age category which represents 30 hospitals data from stage 1 and stage 2 beta testing. The n is also displayed by age category. The highest unadjusted measure rates are seen in the less than 20 and 40 plus age groups. Only unadjusted rates for age are shown. Age is not provided at an adjusted rate, because it is included in the risk model.

1b.05) If no or limited data on disparities from the measure as specified is reported above, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations. Not necessary if performance data provided in above.

Our goal in selecting risk factors for adjustment was to develop parsimonious models that included clinically relevant variables strongly associated with a severe obstetric complication outcome. We used a two-stage approach, first identifying the comorbidity or clinical status risk factors that were most important in predicting the outcome, then considering the potential addition of social risk factors. Social risk factors considered were also dependent on the availability of information in the EHR. Economic/housing instability was included in the model and was chosen due to support in research literature for its inclusion and availability in the EHR. 1

Racial and ethnic disparities for women who identify as racial and ethnic minority groups are at a significantly higher risk for developing these complications than are Non-Hispanic White women.1 Because of the stark differences in maternal outcomes by race/ethnicity as demonstrated in the literature, these social risk factors were examined as stratification variables rather than risk variables, as discussed below. It was determined that illumination of outcome disparities by race/ethnicity, rather than adjustment of outcomes by race/ethnicity, would best inform stakeholders and patients and be most impactful in incentivizing improvements in quality of maternal care.

1. Leonard SA, Main EK, Scott KA, Profit J, Carmichael SL. Racial and ethnic disparities in severe maternal morbidity prevalence and trends. Annals of epidemiology. 2019; 33:30-36.

Scientific Acceptability: Maintenance (2ma.01 - 2ma.04)

Section N/A for Trial Use

2ma.01) Indicate whether additional empirical reliability testing at the accountable entity level has been conducted. If yes, please provide results in the following section, Scientific Acceptability: Reliability - Testing. Include information on all testing conducted (prior testing as well as any new testing).

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous Submission:

Testing from the previous submission here.

☐ Yes
☐ No

2ma.02) Indicate whether additional empirical validity testing at the accountable entity level has been conducted. If yes, please provide results in the following section, Scientific Acceptability: Validity - Testing. Include information on all testing conducted (prior testing as well as any new testing).

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For example:

Current Submission:

Updated testing information here.

Previous Submission:

Testing from the previous submission here.

☐ Yes
☐ No

2ma.03) For outcome, patient-reported outcome, resource use, cost, and some

process measures, risk adjustment/stratification may be conducted. Did you perform a risk adjustment or stratification analysis?

☐ Yes
☐ No

2ma.04) For maintenance measures in which risk adjustment/stratification has been performed, indicate whether additional risk adjustment testing has been conducted since the most recent maintenance evaluation. This may include updates to the risk adjustment analysis with additional clinical, demographic, and social risk factors.

Please update the Scientific Acceptability: Validity - Other Threats to Validity section.

Note: This section must be updated even if social risk factors are not included in the risk adjustment strategy.

☐ Yes - Additional risk adjustment analysis is included
☐ No additional risk adjustment analysis included

Scientific Acceptability: Reliability - Testing (2a.01 - 2a.12)

Section N/A for Trial Use

Measure testing must demonstrate adequate reliability and validity in order to be recommended for endorsement. Testing may be conducted for data elements and/or the computed measure score. Testing information and results should be entered in the appropriate fields in the Scientific Acceptability sections of the Measure Submission Form.

- Measures must be tested for all the data sources and levels of analyses that are specified. If there is more than one set of data specifications or more than one level of analysis, contact Battelle staff at PQMsupport@battelle.org about how to present all the testing information in one form.
- All required sections must be completed.
- For composites with outcome and resource use measures, Questions 2b.23-2b.37 (Risk Adjustment) also must be completed.
- If specified for multiple data sources/sets of specifications (e.g., claims and EHRs), Questions 2b.11-2b.13 also must be completed.
- An appendix for supplemental materials may be submitted (see Question 1 in the Additional section), but there is no guarantee it will be reviewed.
- Contact Battelle staff at PQMsupport@battelle.org with any questions.
- For information on the most updated guidance on how to address social risk factors variables and testing in this form refer to the release notes for the 2021 Measure Evaluation Criteria and Guidance.

Note: The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the testing results for this measure meet the evaluation criteria for testing.

2a. Reliability testing demonstrates the measure data elements are repeatable, producing the same results a high proportion of the time when assessed in the same population in the same time period and/or that the measure score is precise. For instrument-based measures (including PRO-PMs) and composite performance measures, reliability should be demonstrated for the computed performance score.

2b1. Validity testing demonstrates that the measure data elements are correct and/or the measure score correctly reflects the quality of care provided, adequately identifying differences in quality. For instrument-based measures (including PRO-PMs) and composite performance measures, validity should be demonstrated for the computed

performance score.

2b2. Exclusions are supported by the clinical evidence and are of sufficient frequency to warrant inclusion in the specifications of the measure;

AND

If patient preference (e.g., informed decision-making) is a basis for exclusion, there must be evidence that the exclusion impacts performance on the measure; in such cases, the measure must be specified so that the information about patient preference and the effect on the measure is transparent (e.g., numerator category computed separately, denominator exclusion category computed separately).

2b3. For outcome measures and other measures when indicated (e.g., resource use):

• an evidence-based risk-adjustment strategy (e.g., risk models, risk stratification) is specified; is based on patient factors (including clinical and social risk factors) that influence the measured outcome and are present at start of care; 14,15 and has demonstrated adequate discrimination and calibration

OR

• rationale/data support no risk adjustment/ stratification.

2b4. Data analysis of computed measure scores demonstrates that methods for scoring and analysis of the specified measure allow for identification of statistically significant and practically/clinically meaningful 16 differences in performance;

OR

there is evidence of overall less-than-optimal performance.

2b5. If multiple data sources/methods are specified, there is demonstration they produce comparable results.

2b6. Analyses identify the extent and distribution of missing data (or nonresponse) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and non-responders) and how the specified handling of missing data minimizes bias.

2c. For composite performance measures, empirical analyses support the composite construction approach and demonstrate that:

2c1. the component measures fit the quality construct and add value to the overall composite while achieving the related objective of parsimony to the extent possible; and

2c2. the aggregation and weighting rules are consistent with the quality construct and rationale while achieving the related objective of simplicity to the extent possible.
(if not conducted or results not adequate, justification must be submitted and accepted)

Definitions

Reliability testing applies to both the data elements and computed measure score. Examples of reliability testing for data elements include, but are not limited to: inter-rater/abstractor or intra-rater/abstractor studies; internal consistency for multi-item scales; test-retest for survey items. Reliability testing of the measure score addresses precision of measurement (e.g., signal-to-noise).

Validity testing applies to both the data elements and computed measure score. Validity testing of data elements typically analyzes agreement with another authoritative source of the same information. Examples of validity testing of the measure score include, but are not limited to: testing hypotheses that the measures scores indicate quality of care, e.g., measure scores are different for groups known to have differences in quality assessed by another valid quality measure or method; correlation of measure scores with another valid indicator of quality for the specific topic; or relationship to conceptually related measures (e.g., scores on process measures to scores on outcome measures). Face validity of the measure score as a quality indicator may be adequate if accomplished through a systematic and transparent process, by identified experts, and explicitly addresses whether performance scores resulting from the measure as specified can be used to distinguish good from poor quality. The degree of consensus and any areas of disagreement must be provided/discussed.

Examples of evidence that an exclusion distorts measure results include, but are not limited to: frequency of occurrence, variability of exclusions across providers, and sensitivity analyses with and without the exclusion.

Patient preference is not a clinical exception to eligibility and can be influenced by provider interventions.

Risk factors that influence outcomes should not be specified as exclusions.

With large enough sample sizes, small differences that are statistically significant may or may not be practically or clinically meaningful. The substantive question may be, for example, whether a statistically significant difference of one percentage point in the percentage of patients who received smoking cessation counseling (e.g., 74 percent v. 75 percent) is clinically meaningful; or whether a statistically significant difference of $25 in cost for an episode of care (e.g., $5,000 v.$5,025) is practically meaningful. Measures with overall less-than-optimal performance may not demonstrate much variability across providers.

Please separate added or updated information from the most recent measure evaluation within each question response in the Scientific Acceptability sections. For

example:

Current Submission:

Updated testing information here.

Previous (Year) Submission:

Testing from the previous submission here.

2a.01) Select only the data sources for which the measure is tested.

☐ Assessment Data
☐ Claims
☐ Electronic Health Data
☐ Electronic Health Records
☐ Instrument-Based Data
☐ Management Data
☐ Other (please specify here:)
☐ Paper Medical Records
☐ Registry Data

2a.02) If an existing dataset was used, identify the specific dataset.

The dataset used for testing must be consistent with the measure specifications for target population and healthcare entities being measured; e.g., Medicare Part A claims, Medicaid claims, other commercial insurance, nursing home MDS, home health OASIS, clinical registry).

2a.03) Provide the dates of the data used in testing.

Use the following format: "MM-DD-YYYY - MM-DD-YYYY"

2a.04) Select the levels of analysis for which the measure is tested.

Testing must be provided for all the levels specified and intended for measure implementation, e.g., individual clinician, hospital, health plan.

☐ Accountable Care Organization
☐ Clinician: Group/Practice
☐ Clinician: Individual
☐ Facility
☐ Health Plan

☐ Integrated Delivery System
☐ Other (specify)
☐ Population: Community, County or City
☐ Population: Regional and State

2a.05) List the measured entities included in the testing and analysis (by level of analysis and data source).

Identify the number and descriptive characteristics of measured entities included in the analysis (e.g., size, location, type); if a sample was used, describe how entities were selected for inclusion in the sample.

2a.06) Identify the number and descriptive characteristics of patients included in the analysis (e.g., age, sex, race, diagnosis), separated by level of analysis and data source; if a sample was used, describe how patients were selected for inclusion in the sample.

If there is a minimum case count used for testing, that minimum must be reflected in the specifications.

2a.07) If there are differences in the data or sample used for different aspects of testing (e.g., reliability, validity, exclusions, risk adjustment), identify how the data or sample are different for each aspect of testing.

2a.08) List the social risk factors that were available and analyzed.

For example, patient-reported data (e.g., income, education, language), proxy variables when social risk data are not collected from each patient (e.g. census tract), or patient community characteristics (e.g. percent vacant housing, crime rate) which do not have to be a proxy for patient-level data.

Note: If accuracy/correctness (validity) of data elements was empirically tested, separate reliability testing of data elements is not required – in 2a.09 check patient or encounter-level data; in 2a.010 enter “see validity testing section of data elements”; and enter “N/A” for 2a.11 and 2a.12.

2a.09) Select the level of reliability testing conducted.

Choose one or both levels.
☐ Patient or Encounter-Level (e.g., inter-abstractor reliability; data element reliability must address ALL critical data elements)

☐ Accountable Entity Level (e.g., signal-to-noise analysis)

2a.10) For each level of reliability testing checked above, describe the method of reliability testing and what it tests.

Describe the steps—do not just name a method; what type of error does it test; what statistical analysis was used.

2a.11) For each level of reliability testing checked above, what were the statistical results from reliability testing?

For example, provide the percent agreement and kappa for the critical data elements, or distribution of reliability statistics from a signal-to-noise analysis. For score-level reliability testing, when using a signal-to-noise analysis, more than just one overall statistic should be reported (i.e., to demonstrate variation in reliability across providers). If a particular method yields only one statistic, this should be explained. In addition, reporting of results stratified by sample size is preferred (pg. 18, Measure Evaluation Criteria).

2a.12) Interpret the results, in terms of how they demonstrate reliability.

(In other words, what do the results mean and what are the norms for the test conducted?)

Scientific Acceptability: Validity - Testing (2b.01 - 2b.04)

Section N/A for Trial Use

2b.01) Select the level of validity testing that was conducted.

☐ Patient or Encounter-Level (data element validity must address ALL critical data elements)

☐ Accountable Entity Level (e.g., hospitals, clinicians)

☐ Empirical validity testing of the measure score

☐ Systematic assessment of face validity of performance measure score as an indicator of quality or resource use (i.e., is an accurate reflection of performance on quality or resource use and can distinguish good from poor performance)

2b.02) For each level of testing checked above, describe the method of validity testing and what it tests.

Describe the steps—do not just name a method; what was tested, e.g., accuracy of data elements compared to authoritative source, relationship to another measure as expected; what statistical analysis was used.

2b.03) Provide the statistical results from validity testing.

Examples may include correlations or t-test results.

2b.04) Provide your interpretation of the results in terms of demonstrating validity. (i.e., what do the results mean and what are the norms for the test conducted?)

Scientific Acceptability: Validity - Threats to Validity (Statistically Significant Differences, Multiple Data Sources, Missing Data) (2b.05 - 2b.14)

Section N/A for Trial Use

2b.05) Describe the method for determining if statistically significant and clinically/practically meaningful differences in performance measure scores among the measured entities can be identified.

Describe the steps—do not just name a method; what statistical analysis was used? Do not just repeat the information provided in Importance to Measure and Report: Gap in Care/Disparities.

2b.06) Describe the statistical results from testing the ability to identify statistically significant and/or clinically/practically meaningful differences in performance measure scores across measured entities.

Examples may include number and percentage of entities with scores that were statistically significantly different from mean or some benchmark, different from expected; how was meaningful difference defined.

2b.07) Provide your interpretation of the results in terms of demonstrating the ability to identify statistically significant and/or clinically/practically meaningful differences in performance across measured entities.

In other words, what do the results mean in terms of statistical and meaningful differences?

2b.08) Describe the method of testing conducted to identify the extent and distribution of missing data (or non-response) and demonstrate that performance results are not biased due to systematic missing data (or differences between responders and non-responders). Include how the specified handling of missing data minimizes bias.

Describe the steps—do not just name a method; what statistical analysis was used.

2b.09) Provide the overall frequency of missing data, the distribution of missing data across providers, and the results from testing related to missing data.

For example, provide results of sensitivity analysis of the effect of various rules for missing data/non-response. If no empirical sensitivity analysis was conducted, identify the approaches for handling missing data that were considered and benefits and drawbacks of each).

2b.10) Provide your interpretation of the results, in terms of demonstrating that performance results are not biased due to systematic missing data (or differences between responders and non-responders), and how the specified handling of missing data minimizes bias.

In other words, what do the results mean in terms of supporting the selected approach for missing data and what are the norms for the test conducted; if no empirical analysis was conducted, justify the selected approach for missing data.

Note: This item is directed to measures that are risk-adjusted (with or without social risk factors) OR to measures with more than one set of specifications/instructions (e.g., one set of specifications for how to identify and compute the measure from medical record abstraction and a different set of specifications for claims or eCQMs). It does not apply to measures that use more than one source of data in one set of specifications/instructions (e.g., claims data to identify the denominator and medical record abstraction for the numerator). Comparability is not required when comparing performance scores with and without social risk factors in the risk adjustment model. However, if comparability is not demonstrated for measures with more than one set of specifications/instructions, the different specifications (e.g., for medical records vs. claims) should be submitted as separate measures.

2b.11) Indicate whether there is more than one set of specifications for this measure.

☐ Yes, there is more than one set of specifications for this measure
☐ No, there is only one set of specifications for this measure

2b.12) Describe the method of testing conducted to compare performance scores for the same entities across the different data sources/specifications.

Describe the steps—do not just name a method. Indicate what statistical analysis was used.

2b.13) Provide the statistical results from testing comparability of performance scores for the same entities when using different data sources/specifications.

Examples may include correlation, and/or rank order.

2b.14) Provide your interpretation of the results in terms of the differences in performance measure scores for the same entities across the different data sources/specifications.

In other words, what do the results mean and what are the norms for the test conducted.

Scientific Acceptability: Validity - Other Threats to Validity (Exclusions, Risk Adjustment) (2b.15 - 2b.32)

Section N/A for Trial Use

2b.15) Indicate whether the measure uses exclusions.

☐ N/A or no exclusions
☐ Yes, the measure uses exclusions.

2b.16) Describe the method of testing exclusions and what was tested.

Describe the steps—do not just name a method; what was tested, e.g., whether exclusions affect overall performance scores; what statistical analysis was used?

2b.17) Provide the statistical results from testing exclusions.

Include overall number and percentage of individuals excluded, frequency distribution of exclusions across measured entities, and impact on performance measure scores.

2b.18) Provide your interpretation of the results, in terms of demonstrating that exclusions are needed to prevent unfair distortion of performance results.

In other words, the value outweighs the burden of increased data collection and analysis. Note: If patient preference is an exclusion, the measure must be specified so that the effect on the performance score is transparent, e.g., scores with and without exclusion.

2b.19) Check all methods used to address risk factors.

☐ Statistical risk model with risk factors (specify number of risk factors)
☐ Stratification by risk category (specify number of categories)
☐ Other (please specify here:)
☐ No risk adjustment or stratification

2b.20) If using statistical risk models, provide detailed risk model specifications, including the risk model method, risk factors, risk factor data sources, coefficients, equations, codes with descriptors, and definitions.

2b.21) If an outcome or resource use measure is not risk-adjusted or stratified, provide rationale and analyses to demonstrate that controlling for differences in patient characteristics (i.e., case mix) is not needed to achieve fair comparisons across measured entities.

2b.22) Select all applicable resources and methods used to develop the

conceptual model of how social risk impacts this outcome.

☐ Published literature
☐ Internal data analysis
☐ Other (please specify here:)

2b.23) Describe the conceptual and statistical methods and criteria used to test and select patient-level risk factors (e.g., clinical factors, social risk factors) used in the statistical risk model or for stratification by risk.

Please be sure to address the following: potential factors identified in the literature and/or expert panel; regression analysis; statistical significance of p<0.10 or other statistical tests; correlation of x or higher. Patient factors should be present at the start of care, if applicable. Also discuss any "ordering" of risk factor inclusion; note whether social risk factors are added after all clinical factors. Discuss any considerations regarding data sources (e.g., availability, specificity).

2b.24) Detail the statistical results of the analyses used to test and select risk factors for inclusion in or exclusion from the risk model/stratification.

2b.25) Describe the analyses and interpretation resulting in the decision to select or not select social risk factors.

Examples may include prevalence of the factor across measured entities, availability of the data source, empirical association with the outcome, contribution of unique variation in the outcome, or assessment of between-unit effects and within-unit effects. Also describe the impact of adjusting for risk (or making no adjustment) on providers at high or low extremes of risk.

2b.26) Describe the method of testing/analysis used to develop and validate the adequacy of the statistical model or stratification approach (describe the steps—do not just name a method; what statistical analysis was used). Provide the statistical results from testing the approach to control for differences in patient characteristics (i.e., case mix) below. If stratified ONLY, enter "N/A" for questions about the statistical risk model discrimination and calibration statistics.

Validation testing should be conducted in a data set that is separate from the one used to develop the model.

2b.27) Provide risk model discrimination statistics.

For example, provide c-statistics or R-squared values.

2b.28) Provide the statistical risk model calibration statistics (e.g., Hosmer-

Lemeshow statistic).

2b.29) Provide the risk decile plots or calibration curves used in calibrating the statistical risk model.

The preferred file format is .png, but most image formats are acceptable.

2b.30) Provide the results of the risk stratification analysis.

2b.31) Provide your interpretation of the results, in terms of demonstrating adequacy of controlling for differences in patient characteristics (i.e., case mix).

In other words, what do the results mean and what are the norms for the test conducted?

2b.32) Describe any additional testing conducted to justify the risk adjustment approach used in specifying the measure.

Not required but would provide additional support of adequacy of the risk model, e.g., testing of risk model in another data set; sensitivity analysis for missing data; other methods that were assessed.

Feasibility (3.01 - 3.07)

3.01) Check all methods below that are used to generate the data elements needed to compute the measure score.

☒ Generated or collected by and used by healthcare personnel during the provision of care (e.g., blood pressure, lab value, diagnosis, depression score)
☒ Coded by someone other than person obtaining original information (e.g., DRG, ICD-10 codes on claims)
☐ Abstracted from a record by someone other than person obtaining original information (e.g., chart abstraction for quality measure or registry)
☐ Other (Please describe)

3.02) Detail to what extent the specified data elements are available electronically in defined fields.

In other words, indicate whether data elements that are needed to compute the performance measure score are in defined, computer-readable fields. ALL data elements are in defined fields in electronic health records (EHRs)

☐ ALL data elements are in defined fields in electronic claims
☐ ALL data elements are in defined fields in electronic clinical data (e.g., clinical registry, nursing home MDS, home health OASIS)
☒ ALL data elements are in defined fields in a combination of electronic sources
☐ Some data elements are in defined fields in electronic sources
☐ No data elements are in defined fields in electronic sources
☐ Patient/family reported information (may be electronic or paper)

3.03) If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using data elements not from electronic sources.

Not applicable.

3.04) Describe any efforts to develop an eCQM.

This is an eCQM only.

3.05) Complete and attach the eCQM-Feasibility-Scorecard.xls file.

See attachment.

3.06) Describe difficulties (as a result of testing and/or operational use of the

measure) regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

For feasibility testing, virtual EHR Walkthroughs were conducted with nine healthcare sites consisting of 27 individual hospitals, representing three different EHR systems. Feasibility testing included assessment of clinical and documentation workflows compared to measure intent, assessment of data element availability and accuracy, and assessment of use of data standards. The overall feasibility scores based on the specifications were 98%.

Table 3.06.01 Overall Feasibility Rates

PILOT SITES	FEASIBILITY RATE
Pilot Site 1	97%
Pilot Site 2	94%
Pilot Site 3	100%
Pilot Site 4	97%
Pilot Site 5	98%
Pilot Site 6	100%
Pilot Site 7	100%
Pilot Site 8	100%
Pilot Site 9	99%
Overall	98%

Table 3.06.02 Feasibility Rates by Domain

PILOT SITES	DATA AVAILABILITY	DATA ACCURACY	DATA STANDARDS	WORKFLOW
Pilot Site 1	100%	100%	87%	100%
Pilot Site 2	94%	94%	94%	94%
Pilot Site 3	100%	100%	100%	100%
Pilot Site 4	96%	99%	96%	99%
Pilot Site 5	100%	100%	94%	99%
Pilot Site 6	100%	100%	100%	100%
Pilot Site 7	100%	100%	100%	100%
Pilot Site 8	100%	100%	100%	100%
Pilot Site 9	100%	100%	96%	100%
Overall	99%	99%	96%	99%

This table shows the feasibility rates by domain reflecting the specifications.

Based on an overall feasibility score of 98%, ePC07 data elements were found to be highly feasible.

Specific feedback obtained from feasibility testing are listed below. Other findings were site specific and changes to the measure specifications were not deemed necessary.

- POA codes are not consistently assigned to SNOMED codes.

Consider implications for both individuals providing data (patients, service recipients, respondents) and those whose performance is being measured.

3.07) Detail any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm),

Attach the fee schedule here, if applicable.

Not applicable

Use (4a.01 – 4a.10)

Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making.

Endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement, in addition to demonstrating performance improvement.

4a.01) Check all current uses. For each current use checked, please provide:

- **Name of program and sponsor**
- **URL**
- **Purpose**
- **Geographic area and number and percentage of accountable entities and patients included**
- **Level of measurement and setting**

☐ Public Reporting
☐ Public Health/Disease Surveillance
☐ Payment Program
☒ Regulatory and Accreditation Programs

- **Name of program and sponsor:** ORYX Performance Measure Reporting: Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program, The Joint Commission
- **URL:** https://www.jointcommission.org/measurement/reporting/accreditation-oryx/
- **Purpose:** An accreditation program that recognizes hospitals that meet standard requirements to provide safe and effective patient care.
- **Geographic area and number and percentage of accountable entities and patients included:**
    - The Joint Commission accredits 63% of hospitals, 81% of beds; participating hospitals with maternity services includes >2500 US hospitals Nationwide. First year in production. No production data available.
- **Level of measurement and setting:** Outcome measure inpatient delivery hospitalization, all TJC participating hospitals with maternity services

- **Name of program and sponsor:** Centers for Medicare & Medicaid Services (CMS) quality reporting programs
- **URL:** https://ecqi.healthit.gov/ecqm/eh/2023/cms1028v1

- **Purpose:** CMS collects quality data from hospitals paid under the Inpatient Prospective Payment System, with the goal of driving quality improvement through measurement

- **Geographic area and number and percentage of accountable entities and patients included:** 3/4 of the inpatient acute-care hospitals nationwide are paid under the IPPS.

- **Level of measurement and setting:** Outcome measure inpatient delivery hospitalization; Inpatient hospitals paid under the Inpatient Prospective Payment System who perform deliveries or have an obstetrics department.

☐ Professional Certification or Recognition Program

☒ Quality Improvement with Benchmarking (external benchmarking to multiple organizations)

- **Name of program and sponsor:** ORYX Performance Measure Reporting: Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program, The Joint Commission

- **URL:** https://www.jointcommission.org/measurement/reporting/accreditation-oryx/

- **Purpose:** An accreditation program that recognizes hospitals that meet standard requirements to provide safe and effective patient care. The data submitted to The Joint Commission is analyzed for trends and benchmarks.

- **Geographic area and number and percentage of accountable entities and patients included:** The Joint Commission accredits 63% of hospitals, 81% of beds; participating hospitals with maternity services includes >2500 US hospitals Nationwide. First year in production. No production data available.

- **Level of measurement and setting:** Outcome measure inpatient delivery hospitalization, all TJC participating hospitals with maternity services

☒ Quality Improvement (Internal to the specific organization)

- **Name of program and sponsor:** ORYX Performance Measure Reporting: Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program, The Joint Commission

- **URL:** https://www.jointcommission.org/measurement/reporting/accreditation-oryx/

- **Purpose:** An accreditation program that recognizes hospitals that meet standard requirements to provide safe and effective patient care. The data submitted to The Joint Commission is analyzed for trends and benchmarks and provided to the organizations for internal quality improvement purposes.

- **Geographic area and number and percentage of accountable entities and patients included:** The Joint Commission accredits 63% of hospitals, 81% of beds; participating hospitals with maternity services includes >2500 US hospitals Nationwide. First year in production. No production data available.

- **Level of measurement and setting:** Outcome measure inpatient delivery hospitalization, all TJC participating hospitals with maternity services

☐ Not in use
☐ Use unknown
☐ Other (please specify here:)

4a.02) Check all planned uses.

☒ Public reporting
☐ Public Health/Disease Surveillance
☐ Payment Program
☐ Regulatory and Accreditation Program
☐ Professional Certification or Recognition Program
☐ Quality Improvement with Benchmarking (external benchmarking to multiple organizations)
☐ Quality Improvement (internal to the specific organization)
☒ Measure Currently in Use
☐ Other (please specify here:)

4a.03) If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing), explain why the measure is not in use.

For example, do policies or actions of the developer/steward or accountable entities restrict access to performance results or block implementation?

N/A used in TJC accreditation program and CMS Quality Reporting Program

4a.04) If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes: used in any accountability application within 3 years, and publicly reported within 6 years of initial endorsement.

A credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.

N/A used in TJC accreditation program and CMS Quality Reporting Program

4a.05) Describe how performance results, data, and assistance with interpretation have been provided to those being measured or other users during development or implementation.

Detail how many and which types of measured entities and/or others were included. If only a sample of measured entities were included, describe the full population and how the sample was selected.

For reference, each health system will be referred to as a 'pilot site' and 'hospital' will refer to the individual hospitals within the health system. A total of 10 pilot sites consisting of 28 hospitals were included in the pilot project. For feasibility testing, 9 pilot sites with a total of 27 hospitals were included for analysis. After feasibility testing, 1 pilot site representing 2 hospitals withdrew from the project and one additional hospital was added. Therefore, data was collected from 9 pilot sites representing 26 hospitals. Reliability and validity testing was completed on 6 sites representing 15 hospitals.

After the pilot testing concluded and final results were analyzed, a pilot summary report was created and shared with each pilot site via email. Contents of the summary report were presented in a clear manner, with the purpose of each testing modality explained along with information on how to interpret the results of statistical testing. The pilot summary included general measure information, feasibility, reliability and validity testing, risk model, and performance results. Each pilot site received their own individual site measure results and analysis along with the aggregate pilot summary report. Prior to the pilot testing, Joint Commission staff provided virtual information sessions reviewing measure specifications, pilot testing overview and an EHR walkthrough session. Q&A opportunities were provided to the sites. Joint Commission staff also offered assistance to the pilot sites for any questions they had regarding the pilot summary reports.

4a.06) Describe the process for providing measure results, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.

Upon completion of testing, a live national webinar was held on March 8, 2022, to introduce the ePC07 measure including a detailed explanation of the specifications. The webinar included an opportunity for audience members to ask questions.

Severe Obstetric Complications is a new measure, and our implementation plan includes continuous customer engagement. The Joint Commission developed dashboards as part of the ongoing continuous customer engagement project. The dashboard report—posted in the Resources and Tools section of an accredited hospital's secure Joint Commission Connect® extranet site—is representative of each organization's relative performance on each of the selected measures. For each measure, the dashboard shows that organization's performance compared to national, state, and Joint Commission–accredited organization averages. The dashboard is not a scorable element on the survey, but rather, a tool to facilitate discussion about ongoing quality improvement work. For example, surveyors may ask an organization how it addresses the subset of performance measures in the report and what action(s) the

organization is taking to improve processes. In addition, the Joint Commission analyzes aggregate performance of each measure and identifies the measures for which the greatest opportunities for improvement exist among accredited hospitals. Based on those findings, an educational webinar series that address the high-opportunity topics is developed. All accredited hospitals have access to the educational webinar series. Organizations with high opportunity for improvement are particularly encouraged to participate.

An Expert-to-Expert webinar on ePC-07 was held on December 06, 2022. There were 1891 registered and 1056 live attendees. A live demo, review of the measure specifications and logic were presented, and a live Q&A was available to the audience.

4a.07) Summarize the feedback on measure performance and implementation from the measured entities and others. Describe how feedback was obtained.

Since ePC07 was recently published in January of 2022, we do not have measure performance data as of yet. However, we were able to obtain feedback during the pilot testing of this measure. See section 4a.05 for details on pilot test sites. Feedback was also obtained through Technical Expert Panel meetings and surveys, Patient Workgroup meetings and surveys, and public comment.

The Joint Commission plans to use an automated feedback system currently used for feedback on other measures. Access is available to the measured entities and the vendors contracted by measured entities. The measure leads from the clinical team and the eCQM team are responsible for each individual measure set. The system is monitored daily, and responses are typically provided within 8 business hours.

4a.08) Summarize the feedback obtained from those being measured.

During pilot site recruitment and engagement, feedback received from hospitals indicated that leadership teams were interested in the measure, and development of a Severe Obstetric Complications measure was vital and of great value. One hospital was planning on adding the ePC-07 metric to their annual dashboard for future use.

Feedback Obtained During Public Comment:

- The Call for Public Comment ran from November 19, 2021, to December 18, 2021.
- The measure developer solicited public comments by email notification to CMS listserv groups, emails to relevant stakeholders and stakeholder organizations, and posting on the CMS Public Comment website. We received eighteen responses on this topic.
- Some highlights of the public comment are that commenters provided support for:
    - focusing measurement on addressing severe maternal morbidity and improving maternal health outcomes.
    - the usefulness of this measure in assessing and improving the quality of care for patients.
    - publicly reporting both an overall rate of severe obstetric complications and a rate of severe obstetric complications excluding blood transfusion-only cases.
    - an exclusion of patients diagnosed with COVID-19.

- There was also mixed support for the use of SNOMED codes.

4a.09) Summarize the feedback obtained from other users.

- The face validity assessment demonstrated that the Technical Expert Panel members believe that this eCQM is an important health outcome to measure because there is room for improvement, it will produce reliable and valid rates, and hospitals can use the results for performance improvement. While there are some concerns with the feasibility of implementation and whether this measure is a critical component of defining and comparing the quality of obstetric care between hospitals, the majority of the responses from the TEP either agreed or strongly agreed with the ability of this measure to improve patient outcomes.

- As described in 1a.02, the Patient Working Group members strongly believe this eCQM is an important health outcome to measure because there is room for improvement and strongly/moderately agree that this measure is a critical component of defining and comparing the quality of obstetric care between hospitals.

4a.10) Describe how the feedback described has been considered when developing or revising the measure specifications or implementation, including whether the measure was modified and why or why not.

- A denominator exclusion for COVID plus respiratory conditions was added post pilot due to the growing evidence of perinatal complications in women who have COVID-19 infection with respiratory conditions and the support provided from stakeholders in the public comment.

- Pilot site hospitals provided feedback on the patient flow from arrival to discharge. To account for care rendered in an outpatient setting, the logic evaluates any care rendered in the Emergency Department, observation, or OB Triage areas within one hour of inpatient admission.

- Mixed support for SNOMED code use was provided by stakeholders in the public comment. Since pilot testing revealed that POA codes are not consistently assigned to SNOMED codes, SNOMED codes were removed from most numerator and risk variable value sets. It is important that this measure discerns that a severe obstetric complication was not present on admission (POA) and that any condition used for risk adjustment was POA. POA code assignment for ICD10 codes is thoroughly adopted and implemented by healthcare organizations. We recognize the importance and value of SNOMED codes and have therefore developed draft value sets for SNOMED codes for use in future versions of the measure specifically in the numerator and risk variables. We will continue to investigate the feasibility of implementing SNOMED codes with POA codes to allow for use in the measure logic and ensure clinical intent.

Usability (4b.01 - 4b.03)

4b.01) You may refer to data provided in Importance to Measure and Report: Gap in Care/Disparities, but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included). If no improvement was demonstrated, provide an explanation. If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

This is a de novo eCQM intended to measure inpatient acute care hospital quality and performance related to severe obstetric complications and death during the delivery hospitalization. The measure is intended to be used alongside the suite of existing perinatal process of care quality measures and existing quality improvement efforts focused on reducing maternal morbidity and mortality.

Although there are limited measures to assess variability among hospitals, rates in the United States are higher than all other developed countries, presenting an opportunity for improvement. Using the CDC definition of SMM, the US median rate was 1.4% and the highest hospital rate was 12.2%.29 USA Today's database of childbirth complication rates at maternity hospitals, with data from 1,027 hospitals in 13 states from 2014-2017, showed marked variation in median rates of childbirth complications; this variability may reflect similar trends for maternal complications.1,3

Maternal morbidity has garnered a lot of national attention, with a broad range of SMM events and outcomes that can be examined, many of which are closely associated with mortality.2,3 Several initiatives have shown promise in reducing maternal morbidity events. For example, since the inception of the California Maternal Quality Care Collaborative (CMQCC), focused on metrics and toolkits to improve maternal outcomes, the maternal mortality rate in California declined by 55% between 2006 and 2013.4 The CMQCC obstetric hemorrhage collaborative resulted in a 20.8% reduction in SMM in California hospitals compared with the 1.2% reduction in SMM among nonparticipating hospitals.3 The state of California has established a successful framework for assessing and improving quality of maternal care, and outcomes suggest great potential for nationally reducing maternal care complications.

State and national initiatives to measure, track, and reduce maternal morbidity and mortality have produced encouraging results. The Severe Obstetric Complications eCQM could expand these improvements in care, outcomes, and cost savings at a national level. The eCQM will provide hospitals with benchmarking and actionable data to inform their quality improvement efforts; the use of EHR data will provide them with the potential to repurpose the data and measure logic for internal quality control using real-time feedback to further mitigate harm to mothers. Additionally, the eCQM can provide information that allows patients to compare hospitals' performance to aid in their decision making when choosing care.

Additional information can be found in 1a.03.

1. Deadly Deliveries: Childbirth complication rates at maternity hospitals. https://www.usatoday.com/maternal-mortality-harm-hospital-database/.
2. National Quality Forum. Maternal Morbidity and Mortality Environmental Scan. 2020.

3. Main EK. Reducing maternal mortality and severe maternal morbidity through state-based quality improvement initiatives. Clinical obstetrics and gynecology. 2018;61(2):319-331.

4. California Maternal Quality Care Collaborative (CMQCC). Who We Are. https://www.cmqcc.org/who-we-are, 2020.

4b.02) Explain any unexpected findings (positive or negative) during implementation of this measure, including unintended impacts on patients.

The measure specifications were posted January 28, 2022, for optional use in the Joint Commission ORYX Performance Measure Reporting Requirements: Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program. The measure was implemented in CMS' Hospital Inpatient Quality Reporting (IQR) program, starting with voluntary reporting in Calendar Year 2023. No implementation findings at this time. Data will be submitted to The Joint Commission in 2023 for optional year 2022.

Potential unintended consequences: Measuring obstetric complication outcomes based on EHR data may cause a shift in a hospital's resources to support EHR data extraction and reporting, and away from other functions. Also, although the measure numerator definition is broad, hospitals may potentially focus on complications captured in the measure, while dismissing other complications not currently measured but that are important, as well.

4b.03) Explain any unexpected benefits realized from implementation of this measure.

The measure specifications were posted January 28, 2022, for optional use in the Joint Commission ORYX Performance Measure Reporting Requirements: Hospital Accreditation Program (HAP) and Critical Access Hospital Accreditation (CAH) Program. The measure was implemented in CMS' Hospital Inpatient Quality Reporting (IQR) program, starting with voluntary reporting in CY 2023. No implementation findings at this time.

Related and Competing (5.01 - 5.06)

If you are updating a maintenance measure submission for the first time in MIMS, please note that the previous related and competing data appearing in question 5.03 may need to be entered in to 5.01 and 5.02, if the measures are endorsed. Please review and update questions 5.01, 5.02, and 5.03 accordingly.

5.01) Search and select all endorsed related measures (conceptually, either same measure focus or target population) by going to the PQM website.

(Can search and select measures.) Not applicable

5.02) Search and select all endorsed competing measures (conceptually, the measures have both the same measure focus or target population) by going to the PQM website.

(Can search and select measures.) Not applicable

5.03) If there are related or competing measures to this measure, but they are not endorsed, please indicate the measure title and steward.

No related or competing measures.

5.04) If this measure conceptually addresses EITHER the same measure focus OR the same target population as endorsed measure(s), indicate whether the measure specifications are harmonized to the extent possible.

☐ Yes
☒ No

5.05) If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on interpretability and data collection burden.

Not applicable. No related or competing measures.

5.06) Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality). Alternatively, justify endorsing an additional measure.

Provide analyses when possible.

National evaluation of hospitals' performance on maternal morbidity and mortality is limited because there are currently no maternal morbidity or obstetric complications outcome measures in national reporting programs. Current quality measures related to pregnancy and maternal health proposed for or in public reporting programs are largely process measures (e.g., Maternity Care: Post-partum Follow Up and Care Coordination) and outcome measures related to delivery type (e.g., PC-01 Elective Delivery).

There are numerous state agencies, private and/or non-profit organizations, and collaboratives that have spearheaded maternal health and quality improvement initiatives. For instance, the Alliance for Innovation in Maternal Health (AIM) developed evidence-based patient safety bundles to address leading causes of SMM, like obstetric hemorrhage and hypertension. The CDC Perinatal Collaboratives also support various state-based efforts to promote high quality maternal care. The CMQCC created the Maternal Data Center (MDC) for hospitals with Labor and Delivery units in California, Oregon, and Washington. The MDC is an online tool that receives patient discharge data on maternity care services, linking these data to birth certificate or clinical data, and feeding back to clinicians' perinatal performance data for supporting quality improvement.1 The MDC allows hospital performance regional and statewide comparisons. Overall, such quality metrics do not currently cater to a national population because there is extensive variation and timing delays in the widespread adoption and implementation of safety protocols in obstetric care across states.2,3 Moreover, data examining the nationwide implementation of these resources are not widely available.2,4 Therefore, the development of a obstetric complications outcome measure addresses a national measurement gap that can build on learnings from existing maternal health initiatives and measures.

1. California Maternal Quality Care Collaborative (CMQCC). Maternal Data Center. https://www.cmqcc.org/maternal-data-center, 2020.

2 Main EK. Reducing maternal mortality and severe maternal morbidity through state-based quality improvement initiatives. Clinical obstetrics and gynecology. 2018;61(2):319-331.

3. Lenfant C. Clinical research to clinical practice—lost in translation? New England Journal of Medicine. 2003;349(9):868-874.

4. Maher-Griffiths C. Maternal Quality Outcomes and Cost. Critical Care Nursing Clinics. 2019;31(2):177-193.

Additional (1 - 9)

1) Provide any supplemental materials, if needed, as an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be collated one file with a table of contents or bookmarks. If material pertains to a specific criterion, that should be indicated.

☒ Available in attached file
☐ No appendix
☐ Available at measure-specific web page URL identified in sp.09

Attachment: CMS1028v1.zip

Attachment: 3687e_PC07 Bonnie Results Stratification-Alt.pdf
Attachment: 3687e_PC07 Bonnie Results_Alt.pdf

Attachment: 3687e_ValueSets.xlsx

Attachment: 3687e_PC07 Severe Obstetric Complications Flow Diagram

Attachment: 3687e_Trial Use PC07_eCQM_feasibility_final_scorecard

2) List the workgroup/panel members' names and organizations.

Describe the members' role in measure development.

Expert and stakeholder input for the development of this measure was sought from a TEP, a Patient Working Group, and ongoing consultation with Dr. Elliott Main. Members brought expertise in quality improvement, electronic capture of medical information, healthcare disparities, obstetrics and gynecology, and patient perspective. TEP members nominated themselves (or were nominated) to participate in this stakeholder group. The members were engaged during key development milestones providing input on draft measure specifications for the measure cohort, outcome, and risk adjustment, alpha testing and feasibility results, initial beta testing results, and proposed updated measure specifications, as well as the risk adjustment model, measure scores, and further testing results.

Technical Expert Panel (TEP) Members:

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The Patient Working Group:

The Patient Working Group provided personal and insightful perspectives on key measure aspects of measure development and decisions.

Patient Working Group Members:

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Marianne Drexler
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Nikki Montgomery
Euclid, OH

Katie Silwa
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Molly Firth
Tumwater, WA

Kayleigh Summers
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Kim Sandstrom
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3) Indicate the year the measure was first released.

New measure- released January 2022 for optional use by The Joint Commission accredited organizations. The measure was implemented in CMS' Hospital Inpatient Quality Reporting (IQR) program, starting with voluntary reporting in CY 2023.

4) Indicate the month and year of the most recent revision.

05/2022

5) Indicate the frequency of review, or an update schedule, for this measure.

The measure maintenance process includes ongoing review of the evidence supporting the measure, code tables, and necessary logic updates. Questions frequently received and feedback from stakeholders are used to strengthen the specifications for the measure. The measure specifications are updated on an annual basis.

6) Indicate the next scheduled update or review of this measure.

05/2023

7) Provide a copyright statement, if applicable. Otherwise, indicate "N/A".

Measure specifications are in the Public Domain.

8) State any disclaimers, if applicable. Otherwise, indicate "N/A".

These performance measures are not clinical guidelines and do not establish a standard of medical care and have not been tested for all potential applications. The measures and specifications are provided without warranty.

9) Provide any additional information or comments, if applicable. Otherwise, indicate "N/A".

N/A