2021 QCDR Measure Specifications

ANESTHESIA QUALITY INSTITUTE
NATIONAL ANESTHESIA CLINICAL OUTCOMES REGISTRY
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DISCLAIMER

Participation in the ASA® Quality Service does not guarantee satisfactory participation in CMS Merit-based Incentive Payment System (MIPS). Successful submission to CMS is contingent upon each individual eligible clinician (EC) and/or group meeting the MIPS program requirements and the timeliness, quality, and accuracy of the data they provide for reporting.

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The following applies to each Measure that contains the (†) symbol within its title:
† The efforts and contributions of Anesthesia Business Group, ePREOP and TeamHealth to harmonize this Measure with other similar anesthesia quality measures and to update this Measure on an ongoing basis is acknowledged.

The following applies to each Measure that contains the (††) symbol within its title:
†† The efforts and contributions of the American Society of Regional Anesthesia and Pain Medicine to develop and maintain this measure with the American Society of Anesthesiologists on an ongoing basis is acknowledged.

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### Measures Removed from 2021 AQI NACOR QCDR Measure Set

Please note the following measures have been removed or retired from the AQI NACOR registry for QCDR reporting.

<table>
<thead>
<tr>
<th>Measure ID</th>
<th>Measure Title</th>
<th>Reason for Removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQI58</td>
<td>Infection Control Practices for Open Interventional Pain Procedures</td>
<td>CMS did not approve this measure for the 2021 Performance Year.</td>
</tr>
<tr>
<td>AQI61</td>
<td>Ambulatory Post-Discharge Patient Follow-Up</td>
<td>CMS did not approve this measure for the 2021 Performance Year.</td>
</tr>
<tr>
<td>QID 408</td>
<td>Opioid Therapy Follow-Up Evaluation</td>
<td>CMS removed this measure for the 2021 Performance Year.</td>
</tr>
<tr>
<td>QID 412</td>
<td>Documentation of Signed Opioid Treatment Agreement</td>
<td>CMS removed this measure for the 2021 Performance Year.</td>
</tr>
<tr>
<td>QID 414</td>
<td>Evaluation or Interview for Risk Opioid Misuse</td>
<td>CMS removed this measure for the 2021 Performance Year.</td>
</tr>
</tbody>
</table>
Modifications to 2020 QCDR Measures for 2021 AQI NACOR Measure Set

This table identifies changes that were made to AQI NACOR’s QCDR measure specifications in preparation for the 2021 performance year. This table only serves as a general reference in support of but not superseding the final measure specifications for each measure within the book. **Users must refer to the full measure specifications for complete code sets, measure criteria and instructions.**

<table>
<thead>
<tr>
<th>Measure ID</th>
<th>Measure Title</th>
<th>Modifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQI49</td>
<td>Adherence to Blood Conservation Guidelines for Cardiac Operations using Cardiopulmonary Bypass (CPB) - Composite</td>
<td>• Added denominator exception for lung transplants not using cardiopulmonary bypass.</td>
</tr>
</tbody>
</table>

Modifications to Version 1.2 of the 2021 AQI NACOR QCDR Measures Book (May 17, 2021)

- Inclusion of ASA Code 11A80 in AQI72 to capture the denominator exclusion
- Inclusion of risk adjustment methodology for ePreop31
2021 MIPS Measures Available for Reporting through AQI NACOR

Clinicians and groups reporting via Qualified Registry or Qualified Clinical Data Registry (QCDR) can report Merit-based Incentive Payment System (MIPS) measures to fulfill requirements for the MIPS Quality component. [Download full MIPS measure specifications from CMS](#). The naming convention for MIPS measures is “Quality ID XXX” or “QID XXX”.

<table>
<thead>
<tr>
<th>Measure ID</th>
<th>Measure Title</th>
<th>Measure Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>QID 044*</td>
<td>Coronary Artery Bypass Graft (CABG): Preoperative Beta-Blocker in Patients with Isolated CABG Surgery</td>
<td>Process</td>
</tr>
<tr>
<td>QID 047</td>
<td>Advance Care Plan</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 128</td>
<td>Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow-Up Plan</td>
<td>Process</td>
</tr>
<tr>
<td>QID 130</td>
<td>Documentation of Current Medications in the Medical Record</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 154</td>
<td>Falls: Risk Assessment</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 155</td>
<td>Falls: Plan of Care</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 182</td>
<td>Functional Outcome Assessment</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 226</td>
<td>Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention</td>
<td>Process</td>
</tr>
<tr>
<td>QID 317</td>
<td>Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented</td>
<td>Process</td>
</tr>
<tr>
<td>QID 404*</td>
<td>Anesthesiology Smoking Abstinence</td>
<td>Intermediate Outcome – High Priority</td>
</tr>
<tr>
<td>QID 424*</td>
<td>Perioperative Temperature Management</td>
<td>Outcome – High Priority</td>
</tr>
<tr>
<td>QID 430*</td>
<td>Prevention of Post-Operative Nausea and Vomiting (PONV) – Combination Therapy</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 463*</td>
<td>Prevention of Post-Operative Vomiting (POV) – Combination Therapy (Pediatrics)</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 468</td>
<td>Continuity of Pharmacotherapy for Opioid Use Disorder (OUD)</td>
<td>Process – High Priority</td>
</tr>
<tr>
<td>QID 477*</td>
<td>Multimodal Pain Management</td>
<td>Outcome – High Priority</td>
</tr>
</tbody>
</table>

*Measures with an asterisk (*) are included in the CMS-recommended Anesthesiology Measure Set. Eligible clinicians and groups are not required to report these measures towards the six measures required for the MIPS Quality Component but may find them applicable to their practice.
Measure Title
AQL18: Coronary Artery Bypass Graft (CABG): Prolonged Intubation – Inverse Measure

Measure Description
Percentage of patients aged 18 years and older undergoing isolated CABG surgery who require postoperative intubation > 24 hours.

NQS Domain / Meaningful Measures Area
Effective Clinical Care / Preventable Healthcare Harm

Measure Type
Outcome

High Priority Status
Yes

Inverse Measure
Yes

Instructions
This measure is to be reported each time an isolated CABG procedure is performed during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide services for isolated CABG will submit this measure. This measure is intended to reflect the quality of services provided for isolated CABG or isolated reoperation CABG patients.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes and patient demographics are used to identify patients who are included in the measure's denominator. The measure must capture both the surgical and related anesthesia code. G-codes are used to report the numerator of the measure.

Denominator
All patients, aged 18 years and older, undergoing isolated CABG surgery

Definition: Isolated CABG refers to CABG using arterial and/or venous grafts only.

Denominator Criteria (Eligible Cases):
Patient aged 18 years and older on date of encounter

AND
Patient encounter during the reporting period (CPT): 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33533, 33534, 33535, 33536
AND
00566, 00567

OR
Patient encounter during the reporting period (CPT): 33510, 33511, 33512, 33513, 33514, 33516, 33517, 33518, 33519, 33521, 33522, 33523, 33533, 33534, 33535, 33536
AND
Patient encounter during the reporting period (CPT): 33530
AND
00562
Denominator Exclusions
- Organ donors as designated by ASA Physical Status 6

Numerator
Patients who require intubation > 24 hours following exit from the operating room

Numerator Quality-Data Coding Options for Reporting Satisfactorily

<table>
<thead>
<tr>
<th>Performance Met:</th>
<th>G8569</th>
<th>Prolonged postoperative intubation (&gt; 24 hrs) required</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Not Met:</td>
<td>G8570</td>
<td>Prolonged postoperative intubation (&gt;24 hrs) not required</td>
</tr>
</tbody>
</table>

NQF Number: Not applicable
eCQM: Not applicable

Rationale
Prolonged intubation and/or prolonged ventilation following coronary artery bypass graft (CABG) surgery is associated with increased mortality and morbidity.¹ A review of the literature suggests several predictors associated with prolonged ventilation following CABG including increased incidence of pneumonia and pulmonary atelectasis, history of hypertension, COPD, kidney disease and endocarditis among others.² Most complications were associated with prolonged length of stay in the ICU and hospital and increased resource use.

Physician anesthesiologists and other qualified anesthesia providers must maintain respiratory function of patients throughout the perioperative period and play a critical role in patients’ respiratory care. As physician anesthesiologists and other qualified anesthesia providers control the patient breathing function, their decision-making and care related to airway management can greatly impact outcomes related to prolonged intubation and ventilation. One retrospective study found that physicians in the perioperative period are altering their management of types to reduce adverse respiratory outcomes. For example, research shows aortic aneurysm, combined and valve procedures, and preoperative renal dysfunction and stroke were strong predictors for prolonged ventilation. Changes to care and procedures to reduce adverse respiratory outcomes require the engagement of physician anesthesiologist and other qualified anesthesia provider expertise and skill to ensure appropriate patient care.

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 1

Proportion Measure Scoring: Yes

Continuous Measure Scoring: No


Risk Adjustment: No
Care Setting: Hospital Inpatient
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #18: Coronary Artery Bypass Graft (CABG): Prolonged Intubation

SAMPLE CALCULATIONS:

Data Completeness =
Performance Met (a=40 procedures) + Performance Not Met (b=20 procedures) = 60 procedures = 75.00%
Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=40 procedures) = 40 procedures = 66.67%
Data Completeness Numerator (b=60 procedures) = 60 procedures

Version 2.0
November 2020
Measure Title
AQI48: Patient-Reported Experience with Anesthesia†

Measure Description: Percentage of patients aged 18 and older, who were surveyed on their patient experience and satisfaction with anesthesia care and who reported a positive experience.

This measure will consist of two performance rates:

AQI48a: Percentage of patients, aged 18 and older, who were surveyed on their patient experience and satisfaction with anesthesia care

AQI48b: Percentage of patients, aged 18 and older, who completed a survey on their patient experience and satisfaction with anesthesia care and who report a positive experience with anesthesia care

NOTE: The measure requires that a valid survey, as defined in the numerator of 48a, be sent to patients between discharge from the facility and within 30 days of facility discharge. To report AQI 48b, a minimum number of 20 surveys, as described in the numerator of 48a, with the mandatory question completed must be reported. In order to be scored on this measure, clinicians must report BOTH AQI48a AND AQI48b.

NQS Domain / Meaningful Measures Area
Person and Caregiver-Centered Experience and Outcomes / Patient's Experience of Care

Measure Type
Patient-Reported Outcome

High Priority Status
Yes

Inverse Measure:
No

Instructions:
This measure consists of two performance rates: AQI48a and AQI48b. AQI48a should be reported each time a patient undergoes a procedure under anesthesia. AQI48b should be reported every time a completed survey is returned by the patient. To be scored on AQI48b, the provider must collect the individual scores received on the survey as described in AQI48a. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes and patient demographics are used to identify patients who are included in the measure denominator. Registry codes are used to report the measure numerator.

Rationale
Despite the implementation of CAHPS and H-CAHPS, there is a persistent gap in the ability to adequately measure patient experience on the selection of performance measures for performance-based payment programs. To provide high quality, patient-centered care in the future, anesthesiologists and other qualified anesthesia providers should measure and respond to the patients’ perception of the degree to which they felt they were treated as individuals and empowered by their anesthesia practitioners to engage in
decision-making for their care. The assessment of patient satisfaction with anesthesia care provides important feedback which enables providers to improve care delivery and quality. At present there is a vast array of tools available for practices and individuals to implement based upon local patient populations and for local quality improvement initiatives.

Data Source: Database, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 2

Overall Performance Rate for Scoring: AQI48b

Proportion Measure Scoring: Yes

Continuous Measure Scoring: No

Risk Adjusted: No

Care Setting: Ambulatory Care: Clinician Office; Ambulatory Care: Hospital; Hospital; Hospital Inpatient; Outpatient Services
AQL48a

**Description-AQL48a**
Percentage of patients, aged 18 and older, who were surveyed on their patient experience and satisfaction with anesthesia care.

**Denominator-AQL48a**
Patients aged 18 and older, who undergo a procedure* under anesthesia

**Definition:** *Any procedure including surgical, therapeutic or diagnostic

**Denominator Criteria (Eligible Cases):**
Patient aged 18 years or older on date of encounter

**AND**

**AQL 48a: Patient encounter during the reporting period (CPT):**
00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00162, 00164, 00170, 00172, 00174, 00176, 00190, 00192, 00210, 00211, 00212, 00214, 00215, 00216, 00218, 00220, 00222, 00300, 00320, 00322, 00350, 00352, 00400, 00402, 00404, 00406, 00410, 00450, 00454, 00470, 00472, 00474, 00500, 00520, 00522, 00524, 00526, 00528, 00529, 00530, 00532, 00534, 00537, 00539, 00540, 00541, 00542, 00546, 00547, 00550, 00560, 00562, 00563, 00566, 00567, 00580, 00600, 00604, 00620, 00625, 00626, 00630, 00632, 00635, 00640, 00670, 00700, 00702, 00730, 00731, 00732, 00750, 00752, 00754, 00756, 00770, 00790, 00792, 00794, 00796, 00797, 00800, 00802, 00811, 00812, 00813, 00821, 00830, 00832, 00840, 00842, 00844, 00846, 00848, 00851, 00860, 00862, 00864, 00865, 00866, 00868, 00870, 00872, 00873, 00880, 00882, 00902, 00904, 00906, 00908, 00910, 00912, 00914, 00916, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00932, 00934, 00936, 00938, 00940, 00942, 00944, 00948, 00950, 00952, 01112, 01120, 01122, 01130, 01140, 01150, 01160, 01170, 01200, 01202, 01210, 01212, 01214, 01215, 01220, 01230, 01232, 01234, 01250, 01260, 01270, 01272, 01274, 01320, 01340, 01360, 01380, 01382, 01389, 01392, 01400, 01402, 01404, 01420, 01430, 01432, 01440, 01442, 01444, 01462, 01464, 01470, 01472, 01474, 01480, 01482, 01484, 01486, 01490, 01500, 01502, 01520, 01522, 01610, 01620, 01622, 01630, 01634, 01636, 01638, 01650, 01652, 01654, 01656, 01670, 01680, 01710, 01712, 01714, 01716, 01730, 01732, 01740, 01742, 01744, 01756, 01758, 01760, 01770, 01772, 01780, 01782, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01922, 01924, 01925, 01926, 01930, 01931, 01932, 01933, 01935, 01936, 01951, 01952, 01958, 01960, 01961, 01962, 01963, 01965, 01966, 01967, 01991, 01992, 02052, 02056, 02059, 02055, 02055, 02060, 02064, 02065, 02066, 02061, 02061, 27096, 36555, 36556, 36570, 36571, 36578, 36580, 36581, 36582, 36583, 36584, 36585, 62263, 62264, 62270, 62272, 62273, 62280, 62281, 62282, 62320, 62321, 62322, 62323, 62324, 62325, 62326, 62327, 62328, 62329, 62350, 62355, 62360, 62362, 62365, 62370, 63650, 63661, 63662, 63663, 63664, 63685, 63688, 64400, 64405, 64410, 64415, 64416, 64417, 64418, 64420, 64425, 64430, 64435, 64445, 64446, 64447, 64448, 64449, 64450, 64451, 64454, 64461, 64463, 64479, 64483, 64486, 64487, 64488, 64489, 64490, 64493, 64505, 64510, 64517, 64520, 64530, 64560, 64605, 64610, 64620, 64624, 64625, 64630, 64633, 64635, 64640, 64680, 64681, 72275, 93503, 95990, 95991

**Denominator Exclusions-AQL48a**
- Organ Donors as designated with ASA Physical Status 6
- Patient died within 30 days of the procedure: **10A11**
**Numerator-AQI48a:**
Patients who received a survey within 30 days of the procedure to assess their experience and satisfaction with anesthesia.

*Numerator Note:* The survey should be administered to the patient shortly following discharge from the facility.

**Definition:** Practices and eligible clinicians may customize their patient experience and satisfaction with anesthesia surveys to meet local needs but, at a minimum, a valid survey must include a core set of questions that address three of the four following criteria related to patient experience and satisfaction and one mandatory question described below.

1. Pre-operative Education and Preparation
2. Patient and/or Family Communication
3. Care Team Response to Comfort and Well-Being
4. Post-operative pain control and/or management

**Mandatory question** that must be included in each valid survey (practices must also include an option for patient to indicate “Not Applicable”):

1. On a scale of 1 to 5, where 1 indicates the worst anesthesia experience and where 5 indicates the best anesthesia experience, how would you rate your anesthesia experience?

*Numerator Note:* Practices and eligible clinicians may wish to supplement these questions by taking into consideration the recommendations of the ASA Committee on Performance and Outcomes Measurement work product entitled “Patient Satisfaction with Anesthesia White Paper.”

*Numerator Note:* Depending on local practice, practices and eligible clinicians may wish to supplement survey questions by taking into consideration the recommendations developed as part of the Perioperative Surgical Home (PSH) that are structured in five distinct components.

1. Pre-Operative Education and Preparation (Four Indicators)
   a. Patient comfort with instructions provided about eating better
   b. Patient comfort with instructions provided about exercise or physical therapy
   c. Patient comfort with instructions provided about stopping smoking (if applicable)
   d. Patient comfort with instructions provided about what to do after surgery
2. Check-In and Pre-Procedure Experience
3. Caregiver and Family Communication during Surgery
4. Care Team Response to Comfort and Well-Being
5. Post-Operative Pain Management

For more information on these resources, visit https://www.asahq.org/psh.

**Numerator Quality-Data Coding Options for Reporting Satisfactorily: AQI48a**

**Performance Met:**

| 10A12 | Patient provided with a survey within 30 days of the procedure to assess their experience and satisfaction with anesthesia |

**OR**

**Denominator Exception**

| 10A13 | Documentation of patient reason(s), process reason(s) or medical reason(s) |

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for not receiving survey (i.e. patients who are non-verbal, who are unable to be surveyed due to a medical or psychiatric reason, who are unable to be surveyed due to a language barrier, have not provided contact information, who are discharged to assisted living, skilled nursing facility or other similar location where direct access to the patient is not available, or who decline to be surveyed.

**OR**

**Performance Not Met:**

10A14 Patient was not provided with a survey within 30 days of the procedure to assess their experience and satisfaction with anesthesia

AQL48b

**Description-AQL48b**

Percentage of patients who complete the survey from AQL48a on their patient experience and satisfaction with anesthesia care and report a positive experience.

**Denominator-AQL48b**

All patients from the numerator of AQL48a who complete a survey on their patient experience and satisfaction with anesthesia care

*Denominator Note: In order to report AQL48b, the denominator must include a minimum of 20 returned surveys.*

**Denominator Criteria (Eligible Cases):**

Patient completed a survey on their patient experience and satisfaction with anesthesia care: 10A72

**Denominator Exclusions-AQL48b**

- Patient did not complete the mandatory anesthesia satisfaction question: 10A69

**Numerator- AQL 48b:**

Patients who reported a positive experience with anesthesia care.

**Definition:** A positive experience is defined as a response of 4 or 5 on the following mandatory patient experience and satisfaction survey question:

> On a scale of 1 to 5, where 1 indicates the worst anesthesia experience and where 5 indicates the best anesthesia experience, how would you rate your anesthesia experience? *(Practices must include an option for patient to indicate “Not Applicable”)*

**Numerator Quality-Data Coding Options for Reporting Satisfactorily: AQL48b**

Reporting note: To report this measure, the provider must report the individual patient scores. A percentage reporting a positive experience will be calculated on the provider’s behalf.

**Performance Met:**

10A70 Patient reported a positive anesthesia experience (i.e., a 4 or 5 on the mandatory survey question)

**OR**
Performance Not Met:
10A71 Patient did NOT report a positive anesthesia experience (i.e., a 1, 2, or 3 on the mandatory survey question)
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #48a: Patient-Reported Experience with Anesthesia

**Denominator A**

- Not Included in Eligible Patient Population (Denominator A)
  - Yes: Organ Donors designated by ASA Physical Status 6
    - Yes: Patient Encountered as Listed in Denominator
      - Yes: Patient Died within 30 days of procedure 10A11
        - No: Include in Eligible Population/Denominator a (80 procedures)
      - No: Patients aged ≥ 18 Years
        - Yes: Patient provided survey within 30 days of the procedure
          - Yes: Performance Met 10A12 (40 procedures)
          - No: Documentation of patient, process or medical reasons for not receiving survey
            - Yes: Performance Not Met 10A14 (20 procedures)
            - No: Data Completeness Not Met Quality-Data Code or equivalent not submitted (10 procedures)
  - No: Denominator Exclusion

**Numerator A**

- Patient provided survey within 30 days of the procedure
  - Yes: Data Completeness Met + Performance Met 10A12 (40 procedures)
  - No: Documentation of patient, process or medical reasons for not receiving survey
    - Yes: Data Completeness Met + Denominator Exception 10A13 (10 procedures)
    - No: Data Completeness Met + Performance Not Met 10A14 (20 procedures)

**SAMPLE CALCULATIONS:**

- Data Completeness = Performance Met (a=40 procedures) + Denominator Exception (b=10 procedures) + Performance Not Met (c=20 procedures) = 70 procedures = 87.50%
- Eligible Population / Denominator (d=80 procedures) = 80 procedures
- Performance Rate = Performance Met (a=40 procedures) = 40 procedures = 66.67%
- Data Completeness Numerator (70 procedures) – Denominator Exception (b=10 procedures) = 60 procedures

Version 2.0
November 2020
SAMPLE CALCULATIONS:

Data Completeness =
Performance Met (a=15 procedures) + Performance Not Met (b=5 procedures) = 20 procedures = 66.67%

Performace Rate =
Performance Met (a=15 procedures) = 15 procedures = 75.00%

Data Completeness Numerator (20 procedures) = 20 procedures

Version 2.0
November 2020
Measure Title
AQI49: Adherence to Blood Conservation Guidelines for Cardiac Operations using Cardiopulmonary Bypass (CPB) – Composite

Measure Description
Percentage of patients aged 18 years and older, who undergo a cardiac operation using cardiopulmonary bypass for whom selected blood conservation strategies were used.

NQS Domain / Meaningful Measures Area
Effective Clinical Care / Preventable Healthcare Harm

Measure Type
Composite – Process

High Priority Status
No

Inverse Measure
No

Instructions
This measure is to be reported each time a patient undergoes a cardiac operation using cardiopulmonary bypass during the reporting period. This measure has four sub-metrics which are used to calculate the total composite score. All sub-metrics are required to report to indicate performance met or performance not met. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
Patient demographics, CPT codes and Registry codes are used to identify patients who are included in the measure denominator. CPT Category codes and Registry codes are used to report the numerator.

Denominator
Patients aged 18 years and older, who undergo a cardiac operation using cardiopulmonary bypass.

Denominator Note: Patients undergoing a re-operation are included in the denominator to the measure

Denominator Criteria (Eligible Cases):
Patient aged 18 years or older on date of encounter
AND
Patient encounter during the reporting period (CPT): 00562, 00563, 00567, 00580

Denominator Exclusions
- Emergent cases
- Lung transplants not using cardiopulmonary bypass: 11A80

Numerator
Patients for whom selected blood conservation strategies were used

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**Numerator Scoring**: Each blood conservation strategy of this measure accounts for 25% of the total composite score. Each of the four blood conservation strategies must be reported to be included in the performance measurement. The total composite score will be calculated by the data source and not the individual practitioner.

1. **Use of Lysine analogues**

   **Numerator Note**: As indicated by Intraoperative Antifibrinolytic med: Aminocaproic Acid or Tranexamic Acid.

   **Numerator Quality-Data Coding Options for Reporting Satisfactorily**

   **Performance Met:**
   - 10A01 Patients for whom lysine analogues were used.

   OR

   **Performance Not Met:**
   - 10A02 Patients for whom lysine analogues were NOT used.

2. **Use of mini-circuits or Retrograde Autologous Priming (RAP) or Ultrafiltration (Minimize hemodilution caused by cardiopulmonary bypass pump priming solution)**

   **Numerator Note**: Record the usage of retrograde autologous priming or a miniaturized circuit volume by the cardiopulmonary perfusion team prior to the onset of cardiopulmonary bypass.

   **Numerator Note**: Capture the total volume of ultrafiltrate removed by the cardiopulmonary perfusion team during cardiopulmonary bypass and during modified ultra-hemofiltration post-CPB. Record the data in milliliters.

   **Numerator Quality-Data Coding Options for Reporting Satisfactorily**

   **Performance Met:**
   - 10A03 Patients for whom mini-circuits or Retrograde Autologous Priming (RAP) or Ultrafiltration were used.

   OR

   **Performance Not Met:**
   - 10A04 Patients for whom mini-circuits or Retrograde Autologous Priming (RAP) or Ultrafiltration were NOT used.

3. **Use of red cell salvage using centrifugation**

   **Numerator Note**: Capture the volume of cell saver collected and given. Do not include autologous, allogeneic, pump-residual, or chest-tube recirculated blood.

   **Numerator Quality-Data Coding Options for Reporting Satisfactorily**

   **Performance Met:**
   - 10A05 Patients for whom red cell salvage using centrifugation was used.

   OR


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**Performance Not Met:**

*10A06*  
Patients for whom red cell salvage using centrifugation were NOT used.

4. **Use of transfusion algorithm supplemented with point-of-care testing**

*Numerator Note:* Transfusion algorithm includes SCA/STS guideline recommendations or an evidence-based algorithm formulated at the local level.

**Numerator Quality-Data Coding Options for Reporting Satisfactorily**

**Performance Met:**

*10A07*  
Patients for whom transfusion algorithm supplemented with point-of-care testing was used.

**Performance Not Met:**

*10A08*  
Patients for whom transfusion algorithm supplemented with point-of-care testing was NOT used.

**Composite Performance Score**

*Performance Score Note:* This performance score is calculated by the data source and not the individual practitioner. Eligible clinicians reporting this measure must submit numerator quality codes for each of the four blood conservation strategies identified in this measure. The performance score is the cumulative sum of performance met for each blood conservation strategy listed in the numerator of this measure.

For example, for a single patient encounter, if the eligible clinician reports performance met coding for “Use of mini-circuits or RAP or Ultrafiltration”, “Use of red cell salvage using centrifugation”, and “Use of transfusion algorithm supplemented with point-of-care testing” and performance not met for “Use of lysine analogues”, the cumulative score would be calculated as 3 performance met divided by 4 possibilities of performance met that would equal 75%. This eligible clinician for this particular patient would be assessed as “Performance Not Met” because the eligible clinician had a cumulative score less than 100%.

**Performance Met:**

*10A09*  
Patients for whom a cumulative score of 100% of blood conservation strategies was met

**Performance Not Met:**

*10A10*  
Patients for whom a cumulative score of less than 100% of blood conservation strategies was met.

**NQF Number:**  
Not applicable

**eCQM:**  
Not applicable

**Rationale**

Efforts to reduce blood product use have the potential to avoid transfusion-related complications and reduce health care costs. Implementation of a blood use initiative significantly improves postoperative morbidity,
mortality, and resource utilization. Limiting intraoperative and postoperative blood product transfusion decreases adverse postoperative events and reduces health care costs.\textsuperscript{4} Low-risk patients have between an 8- and 10-fold excess risk of adverse outcomes when they receive a blood transfusion. We speculate that careful preoperative assessment of transfusion risk and intervention based on this assessment could minimize operative morbidity and mortality, especially because the patients at least risk are more likely to undergo elective operations and provide time for therapeutic interventions to improve transfusion risk profiles.\textsuperscript{5}

**Clinical Recommendation Statements**

*Perioperative Blood Transfusion and Blood Conservation in Cardiac Surgery: The Society of Thoracic Surgeons and The Society of Cardiovascular Anesthesiologists Clinical Practice Guideline*\textsuperscript{x}\textsuperscript{1}

"Lysine analogues—epsilon-aminocaproic acid (Amicar) and tranexamic acid (Cyklokapron)—reduce total blood loss and decrease the number of patients who require blood transfusion during cardiac procedures and are indicated for blood conservation. (Level of evidence A)"

"Retrograde autologous priming of the CPB circuit may be considered for blood conservation. (Level of evidence B)"

"Routine use of red cell salvage using centrifugation is helpful for blood conservation in cardiac operations using CPB. (Level of evidence A)"

"A multidisciplinary approach involving multiple stakeholders, institutional support, enforceable transfusion algorithms supplemented with point-of-care testing, and all of the already mentioned efficacious blood conservation interventions limits blood transfusion and provides optimal blood conservation for cardiac operations. (Level of evidence A)"

**Data Source:** Claims/Paper Medical Record, Registry  
**Measure Steward:** American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)  
**Number of Performance Rates:** 1  
**Proportion Measure Scoring:** Yes  
**Continuous Measure Scoring:** No  
**Risk Adjustment:** No  
**Care Setting:** Hospital Inpatient


**Multiple Submission Criteria**

**Denominator**
- Start
- Not Included in Eligible Patient Population
  - Yes
  - Patient Aged ≥18 Years
    - Yes
    - Patient Encounter Listed in the Denominator
      - Yes
      - Emergent Case
        - No
        - Lung transplants not using cardiopulmonary bypass
          - No
          - Include in Eligible Population/Denominator (80 procedures)
    - No
    - Denominator Exclusion
      - Yes
      - Not Included in Eligible Patient Population
      - No

**Numerator 1**
- Lysine Analogues Used
  - Yes
  - Data Completeness Met + Performance Met 10A01 (50 procedures)
  - No
  - Data Completeness Met + Performance Not Met 10A02 (20 procedures)
- Lysine Analogues Not Used
  - Yes
  - Data Completeness Not Met Quality-Data code or equivalent not submitted (10 procedures)
  - No

**SAMPLE CALCULATIONS:**
- Data Completeness = \(\frac{\text{Performance Met (a=50 procedures)} + \text{Performance Not Met (b=20 procedures)}}{\text{Eligible Population/Denominator (c=80 procedures)}}\) = 87.50%
- Performance Rate = \(\frac{\text{Performance Met (a=50 procedures)}}{\text{Eligible Population/Denominator (c=80 procedures)}}\) = 71.43%
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #49:
Adherence to Blood Conservation Guidelines for Cardiac Operations Using Cardiopulmonary Bypass (CBP): Use of mini-circuits or Retrograde Autologous Priming (RAP) or Ultrafiltration

Denominator

Start

Not Included in Eligible Patient Population

Patient Aged ≥18 Years

Patient Encounter Listed in the Denominator

Denominator Exclusion

Yes

No

No

Emergent Case

Yes

Lung transplants not using cardiopulmonary bypass

Yes

No

Include in Eligible Population/Denominator (80 procedures)

Numerator 2

Mini-Circuits, RAP, or Ultrafiltration Used

Yes

No

Data Completeness Met + Performance Met 10A03 (50 procedures) a

Mini-Circuits, RAP, or Ultrafiltration Not Used

Yes

Data Completeness Met + Performance Not Met 10A04 (20 procedures) b

Data Completeness Not Met Quality-Data code or equivalent not submitted (10 procedures)

SAMPLE CALCULATIONS:

Data Completeness =

Performance Met (a=50 procedures) + Performance Not Met (b=20 procedures) = 70 procedures = 87.50%

Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate =

Performance Met (a=50 procedures) = 50 procedures = 71.43%

Data Completeness Numerator (70 procedures) = 70 procedures

Version 2.0
November 2020
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #49:
Adherence to Blood Conservation Guidelines for Cardiac Operations Using Cardiopulmonary Bypass (CBP): Use of red cell salvage using centrifugation

**SAMPLE CALCULATIONS:**

Data Completeness = Performance Met (a=50 procedures) + Performance Not Met (b=20 procedures) = 70 procedures = 87.50%
Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate = Performance Met (a=50 procedures) / Denominator (c=80 procedures) = 50 procedures / 80 procedures = 71.43%

Data Completeness Numerator (70 procedures) = 70 procedures

Version 2.0
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2021 Qualified Clinical Data Registry Measure Flow for AQI ID #49:

**Denominator**

- Not Included in Eligible Patient Population
- Patient Aged ≥18 Years
  - Yes: Include in Eligible Population/Denominator (80 procedures)
  - No: Continue
- Patient Encounter Listed in the Denominator
  - Yes: Continue
  - No: Denominator Exclusion
- Emergent Case
  - Yes: Continue
  - No: Lung transplants not using cardiopulmonary bypass
- Lung transplants not using cardiopulmonary bypass
  - Yes: Data Completeness Not Met Quality-Data code or equivalent not submitted (10 procedures)
  - No: Continue

**Composite Numerator**

- 100% of blood conservation strategies met
  - Yes: Data Completeness Met + Performance Met 10A09 (50 procedures) a
  - No: Continue
- 100% of blood conservation strategies not met
  - Yes: Data Completeness Met + Performance Not Met 10A10 (20 procedures) b
  - No: Continue

**Multiple Submission Criteria**

**SAMPLE CALCULATIONS:**

\[
\text{Data Completeness} = \frac{\text{Performance Met} (a=50 \text{ procedures}) + \text{Performance Not Met} (b=20 \text{ procedures})}{\text{Eligible Population / Denominator} (c=80 \text{ procedures})} = \frac{70 \text{ procedures}}{80 \text{ procedures}} = 87.50\%
\]

\[
\text{Performance Rate} = \frac{\text{Performance Met} (a=50 \text{ procedures})}{\text{Data Completeness Numerator} (70 \text{ procedures})} = \frac{50 \text{ procedures}}{70 \text{ procedures}} = 71.43\%
\]

Version 2.0
November 2020
Measure Title
AQI55: Team-Based Implementation of a Care-and-Communication Bundle for ICU Patients

Measure Description
Percentage of patients, regardless of age, who are admitted to an intensive care unit (ICU) for ≥48 hours and who received critical care services who have documentation by managing physician of 1) attempted or actual identification of a surrogate decision maker, 2) an advance directive, and 3) the patient’s preference for cardiopulmonary resuscitation, within 48 hours of ICU admission.

NQS Domain / Meaningful Measures Area
Communication and Care Coordination / Care is Personalized and Aligned with Patient’s Goals

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a patient receives critical care services and is admitted to an intensive care unit for ≥48 hours during the reporting period. It is expected that the managing physician during the first 48 hours of the patient’s intensive care unit stay will report this measure.

Measure Reporting via the Qualified Clinical Data Registry
Patient demographics, CPT codes, and registry codes are used to identify patients who are included in the measure denominator. Registry codes are used to report the numerator of the measure.

Denominator
All patients, regardless of age, who are admitted to an intensive care unit for ≥48 hours and who received critical care services

Denominator Criteria (Eligible Cases):
All patients, regardless of age
AND
Admitted to an intensive care unit for ≥48 hours: 10A58
AND
Received critical care services (CPT): 99291, 99468, 99469, 99471, 99472, 99475, 99476

Denominator Exclusions
• None

Numerator
Patients who have documentation by managing physician of 1) attempted or actual identification of a surrogate decision maker, 2) an advance directive, and 3) the patient’s preference for cardiopulmonary resuscitation, within the first 48 hours of ICU admission.
**Numerator Note:** To meet this measure, the managing physician must either document the required information or confirm that they have reviewed existing documentation of the information.

**Numerator Quality-Data Coding Options for Reporting Satisfactorily**

**Performance Met:**

*10A59* Patient has documentation by managing physician of 1) attempted or actual identification of a surrogate decision maker, 2) an advance directive, and 3) the patient’s preference for cardiopulmonary resuscitation within the first 48 hours of ICU admission

**OR**

**Denominator Exception:**

*10A60* Documentation of patient reason(s) for not documenting all three required numerator elements within the first 48 hours of ICU admission (e.g., patient declines, patient unable to participate in discussion, other patient reason(s))

**OR**

**Performance Not Met:**

*10A61* Patient does not have documentation by managing physician of 1) attempted or actual identification of a surrogate decision maker, 2) an advance directive, and 3) the patient’s preference for cardiopulmonary resuscitation within the first 48 hours of ICU admission

**NQF Number:** Not Applicable

**eCQM:** Not Applicable

**Rationale**

Patient and family engagement remains an important aspect of healthcare, especially in an ICU where advanced illness and pressing time demands place an especially high emotional burden on patients, families and their caregivers. Effective communication between physicians, patients and families and other intensive care unit clinicians has the potential to prevent errors and complications as well as carry out the wishes of the patients.

Research shows that over time, physician anesthesiologists’ attitudes regarding automatically suspending Do-Not-Resuscitate (DNR) orders during the perioperative period have shifted and imply that not only patients, but also more anesthesiologists, value and expect a discussion of advance directives prior to surgery. As important members of the intensive care team, physician anesthesiologists are oftentimes responsible for or provide consultation on critically ill patients’ airway management, including intubation and ventilation. Communication and documentation of patient preferences, including surrogate decision maker, advance directives and cardiopulmonary resuscitation is essential for all members of the intensive care team to appropriately deliver care and engage patients and families throughout the perioperative period.

Patient engagement strategies have been shown to be most effective when implemented together in the form of a bundle. This measure is designed to address key components of critical care that are important to

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patients, families and professionals. This measure is designed to align with the Care and Communication Bundle that was developed by the Society of Critical Care Medicine (SCCM) in collaboration with VHA, Inc., a national network of community-based hospitals.\(^7\)

**Clinical Recommendation Statement**

**2014 ASA Guidelines for the Practice of Critical Care by Anesthesiologists\(^8,9\)**

“Due to the complex nature of critical illness, coordination of care is required. Therefore, one individual, either the critical care anesthesiologist or another physician, must assume global responsibilities for the patient to include all aspects of patient care, including communication with the patient, family and other providers.”

“The anesthesiologist-intensivist needs to be intimately involved in the ethical dilemmas that commonly develop in the intensive care unit, in appropriately communicating with patients and their families in making decisions regarding the appropriateness of treatment, and in understanding the need to maintain patient autonomy and dignity.”

**Data Source:** Claims/Paper Medical Record, Registry

**Measure Steward:** American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

**Number of Performance Rates:** 1

**Proportion Measure Scoring:** Yes

**Continuous Measure Scoring:** No

**Risk Adjustment:** No

**Care Setting:** Hospital Inpatient

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2021 Qualified Clinical Data Registry Measure Flow for AQI ID #55:
Team-Based Implementation of a Care-and-Communication Bundle for ICU Communication

**SAMPLE CALCULATIONS:**

Data Completeness =
Performance Met (a=45 procedures) + Denominator Exception (b=15 procedures) + Performance Not Met (c=10 procedures) = 70 procedures = 87.50%

Eligible Population / Denominator (d=80 procedures) = 100.00%

Performance Rate =
Performance Met (a=45 procedures) / Data Completeness Numerator (70 procedures) = 45 procedures / 70 procedures = 64.29%

Data Completeness Numerator (70 procedures) – Denominator Exception (b=15 procedures) = 55 procedures

Version 2.0
November 2020
Measure Title
AQI56: Use of Neuraxial Techniques and/or Peripheral Nerve Blocks for Total Knee Arthroplasty (TKA) ††

Measure Description
Percentage of patients, regardless of age, that undergo primary total knee arthroplasty for whom neuraxial anesthesia and/or a peripheral nerve block is performed.

NQS Domain / Meaningful Measures Area
Effective Clinical Care / Appropriate use of Healthcare

Measure Type
Process

High Priority Status
No

Inverse Measure
No

Instructions
This measure is to be reported each time a patient undergoes primary total knee arthroplasty. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes are used to identify patients who are included in the measure denominator. Registry codes are used to report the numerator of the measure.

Denominator
All patients, regardless of age, who undergo primary total knee arthroplasty

Denominator Criteria (Eligible Cases):
All patients, regardless of age
AND
Patient encounter during the reporting period (CPT):
01402

Denominator Exclusions
• Revision of TKA: CPT 27486, 27487 or 11A09
• Prosthesis Removal: CPT 27488 or 11A10

Numerator
Patients for whom neuraxial anesthesia and/or a peripheral nerve block is performed.

Numerator Note: For the purposes of this measure, a peripheral nerve block performed either as primary procedural anesthesia or performed for postoperative analgesia would meet the numerator.
Numerator Quality-Data Coding Options for Reporting Satisfactorily

**Performance Met:**

**10A78**
Neuraxial anesthesia and/or a peripheral nerve block was used

**OR**

**Denominator Exception:**

**11A01**
Documentation of patient reason(s) for not using either neuraxial anesthesia or a peripheral nerve block (e.g., patient refusal)

**OR**

**Performance Not Met:**

**10A79**
Neuraxial anesthesia and/or a peripheral nerve block was NOT used

**NQF Number:**
Not Applicable

**eCQM:**
Not Applicable

**Rationale**

Regional anesthesia is associated with improved patient outcomes and lower postoperative morbidity and mortality compared to general anesthesia in patients undergoing TKA.\(^{10}\) Patients receiving neuraxial anesthesia typically lose less blood during surgery, leading to reduced need for many blood transfusions.\(^{11}\) Additionally, some studies support the notion that spinal anesthesia is associated with lower incidence of surgical site infection when compared to general anesthesia.\(^{12}\) Peripheral nerve blocks (PNBs) can be used as part of a pain management protocol after knee replacement surgery when compared with systemic analgesia, patients receiving PNBs have better pain scores and use less opioids after surgery.\(^{13}\) By requiring fewer opioids after surgery, patients also avoid opioid-related side effect such as sedation, respiratory depression, nausea, vomiting, and constipation. They also have better functional outcomes and have overall, a better perioperative experience.\(^{14}\)

Strength of the evidence supporting neuraxial anesthesia and PNB is sometimes questioned as some of the supporting studies are retrospective in nature and mainly derived from analysis of administrative databases. However, evidence from randomized clinical trials either support better outcomes with regional anesthesia or show that there is no difference with the anesthesia technique.\(^{15}\)

**Clinical Recommendation Statements**


“Strong evidence supports that peripheral nerve blockade for total knee arthroplasty (TKA) decreases postoperative pain and opioid requirements. Strength of Recommendation: Strong Evidence: 4 stars”

“Moderate evidence supports that neuraxial anesthesia could be used in total knee arthroplasty (TKA) to improve select perioperative outcomes and complication rates compared to general anesthesia. Strength of Recommendation: Moderate, Evidence: 3 stars”

**Data Source:** Claims/Paper Medical Record, Registry

**Measure Steward:** American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

**Number of Performance Rates:** 1

**Proportion Measure Scoring:** Yes

**Continuous Measure Scoring:** No

**Risk Adjustment:** No

**Care Setting:** Ambulatory Care: Hospital; Hospital Inpatient; Hospital Outpatient Services

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2021 Qualified Clinical Data Registry Measure Flow for AQI ID #56:
Use of Neuraxial Techniques and/or Peripheral Nerve Blocks for Total Knee Arthroplasty (TKA)

Denominator

Start

Not Included in Eligible Patient Population

Denominator Exclusion

All patients, regardless of age

Patient Encounter Listed in Denominator

Yes

No

Revision of Total Knee Arthroplasty

Prosthesis Removal

Include in Eligible Population/Denominator (80 procedures)

Numerator

Neuraxial Anesthesia and/or Peripheral Nerve Block used

Yes

No

Documentation for not using Peripheral Nerve Block

Yes

No

Neuraxial Anesthesia and/or Peripheral Nerve Block NOT used

Data Completeness Met + Performance Met 10A78 (50 procedures) a

Data Completeness Met + Denominator Exception 11A01 (10 procedures) b

Data Completeness Met + Performance Not Met 10A79 (10 procedures) c

Data Completeness Not Met Quality-Data code or equivalent not submitted (10 procedures)

SAMPLE CALCULATIONS:

Data Completeness = Performance Met (a=50 procedures) + Denominator Exception (b=10 procedures) + Performance Not Met (c=10 procedures) = 70 procedures = 87.50%

Eligible Population / Denominator (d=80 procedures) = 80 procedures

Performance Rate = Performance Met (a=50 procedures) / Performance (a=50 procedures) = 50 procedures = 83.33%

Data Completeness Numerator (70 procedures) – Denominator Exception (b=10 procedures) = 60 procedures

Version 2.0
November 2020
Measure Title
AQI57: Safe Opioid Prescribing Practices ††

Measure Description
Percentage of patients, aged 18 years and older, prescribed opioid medications for longer than six weeks’ duration for whom ALL of the following opioid prescribing best practices are followed:

1. Chemical dependency screening (includes laboratory testing and/or questionnaire) within the immediate 6 months prior to the encounter
2. Co-prescription of naloxone or documented discussion regarding offer of Naloxone co-prescription, if prescription is ≥50 MME/day
3. Non co-prescription of benzodiazepine medications by prescribing pain physician and documentation of a discussion with patient regarding risks of concomitant use of benzodiazepine and opioid medications.

NQS Domain / Meaningful Measures Area
Effective Clinical Care / Prevention and Treatment of Opioid and Substance Use Disorders

Measure Type
Composite – Process

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a patient is prescribed opioid medications for longer than six weeks’ duration during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
Patient demographics, G-codes and CPT codes are used to identify patients who are included in the measure denominator. Registry codes are used to report the numerator of the measure.

Denominator
All patients aged 18 years and older prescribed opioid medications for longer than six weeks’ duration

Denominator Criteria (Eligible Cases):
Patients aged 18 years and older
AND
Patient encounter during the reporting period (CPT): , 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99217, 99218, 99219, 99220, 99224, 99225, 99226, 99241, 99242, 99243, 99244, 99245, 99281, 99282, 99283, 99284, 99285
AND
Patients prescribed opioids for longer than six weeks’ duration: G9561

Denominator Exclusions
• None
Numerator
Patients for whom ALL of the following opioid prescribing best practices are followed:

1. Chemical dependency screening (includes laboratory testing and/or questionnaire) within the immediate 6 months prior to the encounter
2. Co-prescription of Naloxone, or documented discussion regarding offer of Naloxone co-prescription, if opioid prescription is ≥50 MME/day
3. Non co-prescription of benzodiazepine medications by prescribing pain physician and documentation of a discussion with patient regarding risks of concomitant use of benzodiazepine and opioid medications.

Numeratort Note: Chemical Dependency Screening: Questionnaires for chemical dependency screening can include the Opioid Risk Tool (ORT), Screener and Opioid Assessment for Patients with Pain (SOAPP), Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R), or the Diagnosis, Intractability, Risk, Efficacy (DIRE) tool.

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Measure Scoring Note: In order to receive credit for this measure, ALL three numerator criteria must be reported. See the “Composite Performance Score” section for more details on how this measure is scored.

Criterion 1:

Performance Met:

10A92 Chemical dependency screening (including laboratory testing and/or questionnaire) was performed within the immediate 6 months prior to the encounter

OR

Performance Not Met:

10A93 Chemical dependency screening (including laboratory testing and/or questionnaire) was NOT performed within the immediate 6 months prior to the encounter

Criterion 2:

Performance Met:

10A94 Naloxone co-prescribed or documented discussion regarding offer of Naloxone co-prescription for opioid prescription ≥50 MME/day

OR

10A95 Not applicable, opioid prescription <50 MME/day

OR

Performance Not Met:

10A96 Naloxone NOT co-prescribed AND discussion NOT documented regarding offer of Naloxone co-prescription for opioid prescription ≥50 MME/day

Criterion 3:

Performance Met:
**10A97**  
Benzodiazepine medications NOT co-prescribed by prescribing pain physician AND documented discussion regarding risks of concomitant use of benzodiazepine and opioid medications

**OR**

**Performance Not Met:**

**10A98**  
Benzodiazepine medications co-prescribed by prescribing pain physician AND/OR no documented discussion regarding risks of concomitant use of benzodiazepine and opioid medications

**Composite Performance Score**

*Performance Score Note:* This performance score is calculated by the data source and not the individual practitioner. Eligible clinicians reporting this measure must submit numerator quality codes for each of the three numerator criteria identified in this measure. *This measure utilizes an all-or-none scoring methodology* where failure to meet performance for ANY of the three numerator criteria will result in performance not met for the measure. The performance score is the percentage of denominator-eligible cases for which ALL three numerator criteria are met.

**Performance Met:**

**10A92**  
Chemical dependency screening (including laboratory testing and/or questionnaire) was performed within the immediate 6 months prior to the encounter

**AND**

**10A94**  
Naloxone co-prescribed or documented discussion regarding offer of Naloxone co-prescription for opioid prescription ≥50 MME/day

**OR**

**10A95**  
Not applicable, opioid prescription <50 MME/day

**AND**

**10A97**  
Benzodiazepine medications NOT co-prescribed by prescribing pain physician AND documented discussion regarding risks of concomitant use of benzodiazepine and opioid medications

**OR**

**Performance Not Met:**

**10A93**  
Chemical dependency screening (including laboratory testing and/or questionnaire) was NOT performed within the immediate 6 months prior to the encounter

**AND/OR**

**10A96**  
Naloxone NOT co-prescribed AND discussion NOT documented regarding offer of Naloxone co-prescription for opioid prescription ≥50 MME/day

**AND/OR**
Benzodiazepine medications co-prescribed by prescribing pain physician AND/OR no documented discussion regarding risks of concomitant use of benzodiazepine and opioid medications

NQF Number: Not Applicable

eCQM: Not Applicable

Rationale
In 2016, more than 61 million patients had at least one opioid prescription filled or refilled, accounting for more than 214 million individual opioid prescriptions. Use of opioid pain medication is associated with serious risks, including overdose and opioid use disorder. Given these risks, it is essential for providers who prescribe opioid medications to carefully assess the risks and benefits of opioid therapy and to follow safe prescribing practices. Through the completion of dependency screening, the provision of Naloxone, and the avoidance of co-prescription of benzodiazepine medications, providers can help mitigate some of the most serious risks associated with opioid therapy.

Clinical Recommendation Statements

2016 CDC Guideline for Prescribing Opioids for Chronic Pain—United States

“When prescribing opioids for chronic pain, clinicians should use urine drug testing before starting opioid therapy and consider urine drug testing at least annually to assess for prescribed medications as well as other controlled prescription drugs and illicit drugs. (Recommendation category: B; evidence type: 4)”

“Before starting and periodically during continuation of opioid therapy, clinicians should evaluate risk factors for opioid-related harms. Clinicians should incorporate into the management plan strategies to mitigate risk, including considering offering naloxone when factors that increase risk for opioid overdose, such as history of overdose, history of substance use disorder, higher opioid dosages (≥50 MME/d), or concurrent benzodiazepine use, are present. (Recommendation category: A; evidence type: 4)”

“Clinicians should avoid prescribing opioid pain medication and benzodiazepines concurrently whenever possible. (Recommendation category: A; evidence type: 3)”

2017 VA/DoD Clinical Practice Guideline for Opioid Therapy for Chronic Pain

“We recommend implementing risk mitigation strategies upon initiation of long-term opioid therapy, starting with an informed consent conversation covering the risks and benefits of opioid therapy as well as alternative therapies. The strategies and their frequency should be commensurate with risk factors and include:

- Ongoing, random urine drug testing (including appropriate confirmatory testing)
- Checking state prescription drug monitoring programs
- Monitoring for overdose potential and suicidality
- Providing overdose education


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• Prescribing of naloxone rescue and accompanying education
  (Strong for | Reviewed, New-replaced)

“We recommend against the concurrent use of benzodiazepines and opioids. (Strong against | Reviewed, New-added).”

Data Source: Claims/Paper Medical Record, Registry
Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 1
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Risk Adjustment: No
Care Setting: Ambulatory Care: Clinician Office/Clinic
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #57: Safe Opioid Prescribing Practices
Submission Criterion One

**Denominator**

Start

- **Not Included in Eligible Patient Population**
  - No

- **Patient aged ≥ 18 Years**
  - Yes

- **Patient Encounter listed in Denominator**
  - Yes

- **Patient Prescribed Opioids for Longer than 6 Weeks’ Duration G9561**
  - Yes

  - Include in Eligible Population/Denominator (80 procedures)

  - **Data Completeness Not Met**
    - Quality-Data Code or equivalent was not submitted (2 procedures)

- **Chemical dependency screening performed**
  - Yes

  - Data Completeness Met + Performance Met 10A92 (74 procedures)

  - **Data Completeness Met + Performance Not Met 10A93** (4 procedures)

- **Chemical dependency screening not performed**
  - No

**Numerator 1**

**Multiple Submission Criteria**

**SAMPLE CALCULATIONS: Submission Criterion 1**

Composite data required for scoring

Data Completeness = Performance Met (a=74 procedures) + Performance Not Met (b = 4 procedures) = 78 procedures = 97.50%

Performance Rate = Performance Met (a=74 procedures) = 74 procedures = 94.87%

Data Completeness Numerator (78 procedures) = 78 procedures

Version 2.0
November 2020
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #57: Safe Opioid Prescribing Practices Submission Criteria Two

**Multiple Submission Criteria**

Denominator

Start

Not Included in Eligible Patient Population

Patient aged ≥ 18 Years

Patient Encounter listed in Denominator

Patient Prescribed Opioids for Longer than 6 Weeks’ Duration G9561

Include in Eligible Population/Denominator (80 procedures)

Naloxone co-prescribed or documented discussion for ≥ 50 MME/day

Data Completeness Met + Performance Met 10A94 (70 procedures)

Data Completeness Met + Performance Met 10A95 (5 procedures)

Data Completeness Met + Performance Not Met 10A96 (1 procedure)

Data Completeness Not Met Quality-Data Code or equivalent was not submitted (4 procedures)

Naloxone not co-prescribed or documented discussion for ≥ 50 MME/day

Not applicable, opioid prescription < 50 MME/day

SAMPLE CALCULATIONS: Submission Criterion 2

Composite data required for scoring

Data Completeness =
Performance Met (a + b = 75 procedures) + Performance Not Met (c=1 procedure) = 76 procedures = 95.00%

Eligible Population / Denominator (d=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a + b = 75 procedures) = 75 procedures = 98.68%

Data Completeness Numerator (76 procedures) = 76 procedures

Version 2.0
November 2020
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #57: Safe Opioid Prescribing Practices
Submission Criteria Three

**Denominator**

Start

- Not Included in Eligible Patient Population
  - No
  - Patient aged ≥ 18 Years
    - Yes
    - Patient Encounter listed in Denominator
      - Yes
      - Patient Prescribed Opioids for Longer than 6 Weeks’ Duration G9561
        - Yes
        - Include in Eligible Population/ Denominator (80 procedures)
        - No
        - Data Completeness Not Met Quality-Data Code or equivalent was not submitted (4 procedures)
      - No
        - Data Completeness Met + Performance Not Met 10A98 (5 procedures)

- Yes
  - Benzodiazepines co-prescribed AND/OR documented discussion on risks of concomitant use
    - Yes
      - Data Completeness Met + Performance Met 10A97 (71 procedures)
    - No
      - Data Completeness Not Met Quality-Data Code or equivalent was not submitted (4 procedures)

**Numerator 3**

SAMPLE CALCULATIONS: Submission Criterion 3
Composite data required for scoring

Data Completeness =
Performance Met (a=71 procedures) + Performance Not Met (b=50 procedures) = 76 procedures = 95.00%
Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=71 procedures) = 71 procedures = 93.42%
Data Completeness Numerator (76 procedures) = 76 procedures

Version 2.0
November 2020
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #57: Safe Opioid Prescribing Practices

Composite Submission Criteria

**Denominator**

- Patient aged ≥ 18 Years
- Patient Encounter listed in Denominator
- Patient Prescribed Opioids for Longer than 6 Weeks’ Duration G9561

**Composite Numerator**

- Chemical dependency screening performed
- Naloxone co-prescribed or documented discussion for ≥ 50 MME/day
- Benzodiazepines not co-prescribed AND documented discussion on risks of concomitant use

**Sample Calculations:** Composite Submission Criteria

Data Completeness = 
Performance Met = 60 procedures + Performance Not Met = 10 procedures

Performance Rate = 
Performance Rate Met = 70 procedures = 87.50%

Data Completeness Numerator = 60 procedures

Quality Data Code or equivalent was not submitted = 10 procedures

Version 2.0
November 2020
Measure Title
AQI62: Obstructive Sleep Apnea: Patient Education

Measure Description: Percentage of patients aged 18 years or older, who undergo an elective procedure requiring anesthesia services who are screened for obstructive sleep apnea AND, if positive, have documentation that they received education regarding their risk for obstructive sleep apnea (OSA) prior to PACU discharge.

NQS Domain / Meaningful Measures Area
Effective Clinical Care / Management of Chronic Conditions

Measure Type
Process

High Priority Status
No

Inverse Measure
No

Instructions
This measure is to be reported each time a patient undergoes an elective procedure under anesthesia during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
Patient demographics and CPT codes are used to identify patients who are included in the measure denominator. G-codes and Registry Codes are used to capture the numerator.

Denominator
All patients aged 18 years or older, who undergo an elective procedure requiring anesthesia services

Denominator Note: For the purposes of this measure, anesthesia services only include cases using general anesthesia, neuraxial anesthesia and monitored anesthesia care (MAC)

Denominator Criteria (Eligible Cases):
Patients aged 18 years and older
AND
Elective procedure: G9643
AND
Patient encounter during the reporting period (CPT):
00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148,
00160, 00162, 00164, 00170, 00172, 00174, 00176, 00190, 00192, 00210, 00211, 00212, 00214,
00215, 00216, 00218, 00220, 00222, 00300, 00320, 00322, 00350, 00352, 00400, 00402, 00404,
00406, 00410, 00450, 00454, 00470, 00472, 00474, 00500, 00520, 00522, 00524, 00528, 00529,
00530, 00532, 00534, 00537, 00539, 00540, 00541, 00542, 00546, 00548, 00550, 00560, 00562,
00563, 00566, 00567, 00580, 00600, 00604, 00620, 00625, 00626, 00630, 00632, 00635, 00640,
Denominator Exclusions
- Patient has an existing diagnosis of OSA: G47.33 or 11A29
- Documentation of patient reason for not providing education regarding risk for OSA (e.g., severe dementia, patient is intubated, patient is not alert or responsive enough to participate in education, other patient reason(s)): 11A30

Numerator
Patients who are screened for obstructive sleep apnea AND, if positive, have documented education regarding their risk for obstructive sleep apnea prior to PACU discharge

Numerator Definition: Patient education regarding OSA must include documentation that a conversation addressing potential implications of OSA on the patient’s perioperative course and any applicable recommendations for follow-up care and disease management occurred. Self-help materials (e.g., brochures, audio/video materials, pamphlets) alone are not sufficient to meet the numerator.

Numerator Quality-Data Coding Options for Reporting Satisfactorily
Performance Met:
- 11A31  Positive patient OSA screen AND documented education regarding risk for obstructive sleep apnea prior to PACU discharge
  OR
- 11A32  Negative patient screen for OSA
  OR
- 11A33  No patient screen for OSA OR positive OSA screen result and no documented education regarding risk for obstructive sleep apnea prior to PACU discharge

NQF Number: Not applicable
Rationale
Obstructive Sleep Apnea (OSA) is a common problem in the surgical population, though many patients with OSA are undiagnosed. With improved preoperative assessment for OSA, surgery presents an important opportunity for providers to counsel patients about their risk for OSA and to educate them on the associated perioperative risks associated with the condition. This education is an opportunity to manage patient and family expectations regarding their postoperative course and is a chance to discuss anticipated complications, changes in management, and recommended follow-up care that might be appropriate.

Clinical Recommendation Statements:

2014 ASA Guidelines on Perioperative Management of Patients with Obstructive Sleep Apnea
“If any characteristics noted during the preoperative evaluation suggest that the patient has OSA, the anesthesiologist and surgeon should jointly decide whether to (1) manage the patient perioperatively based on clinical criteria alone or (2) obtain sleep studies, conduct a more extensive airway examination, and initiate indicated OSA treatment in advance of surgery.”

“The patient and his or her family as well as the surgeon should be informed of the potential implications of OSA on the patient’s perioperative course.”

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA)/Anesthesia Quality Institute (AQI)

Number of Multiple Performance Rates: Not applicable
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Risk Adjustment: No

Care Setting: Ambulatory Care: Clinician Office; Ambulatory Care: Hospital; Hospital; Hospital Inpatient; Outpatient Services
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #62
Obstructive Sleep Apnea: Patient Education

**Denominator**

Start

- Not Included in Eligible Patient Population
  - Patient aged 18 years and older
    - Elective procedure G9643
      - Patient Received Services Listed in Denominator
        - Patient has an existing diagnosis for OSA: G47.33 or 11A29
          - Documentation of patient reason for not providing Education 11A30

**Numerator**

- Positive Screen AND Documented Patient Education
  - Negative Patient Screen for OSA
    - No Screen for OSA or Positive Screen/Diagnosis and No Patient Education
      - Data Completeness Met + Performance Met 11A31 OR 11A32 (60 procedures)

- Data Completeness Met + Performance Not Met 11A33 (10 procedures)

- Data Completeness Not Met Quality-Data Code or equivalent was not submitted (10 procedures)

**SAMPLE CALCULATIONS**

- Data Completeness = Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) / Eligible Population / Denominator (c=80 procedures) = 70 procedures / 80 procedures = 87.50%

- Performance Rate = Performance Met (a=60 procedures) / Data Completeness Numerator (70 procedures) = 60 procedures / 70 procedures = 85.71%
Measure Title
AQI65: Avoidance of Cerebral Hyperthermia for Procedures Involving Cardiopulmonary Bypass

Measure Description: Percentage of patients, aged 18 years and older, undergoing a procedure using cardiopulmonary bypass who did not have a documented intraoperative pulmonary artery, oropharyngeal, or nasopharyngeal temperature ≥37.0 degrees Celsius during the period of cardiopulmonary bypass.

NQS Domain / Meaningful Measures Area
Patient Safety / Preventable Healthcare Harm

Measure Type
Outcome

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a patient undergoes a cardiac operation using cardiopulmonary bypass during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes and patient demographics are used to identify patients who are included in the measure’s denominator. Registry codes are used to report the numerator.

Denominator
All patients aged 18 years or older, who undergo a procedure using cardiopulmonary bypass

Denominator Criteria (Eligible Cases):
Patient aged 18 years and older
AND
Patient encounter during the reporting period (CPT): 00562, 00563, 00567, 00580

Denominator Exclusions: None

Numerator: Patients who did not have an intraoperative pulmonary artery, oropharyngeal, or nasopharyngeal temperature ≥37.0 degrees Celsius during cardiopulmonary bypass

Numerator Quality-Data Coding Options for Reporting Satisfactorily
Performance Met: 11A11

All intraoperative pulmonary artery, oropharyngeal, or nasopharyngeal temperatures <37.0 degrees Celsius during cardiopulmonary bypass

OR
Performance Not Met:

11A12 At least one intraoperative pulmonary artery, oropharyngeal, or nasopharyngeal temperature ≥37.0 degrees Celsius

OR

11A13 No documented pulmonary artery, oropharyngeal, or nasopharyngeal temperatures during cardiopulmonary bypass

NQF Number: Not applicable
eCQM: Not applicable

Rationale
Appropriate temperature management in the setting of cardiopulmonary bypass (CPB) is important to avoid cerebral hyperthermia and associated cerebral injury. Studies have associated cerebral hyperthermia with complications such as cognitive dysfunction, mediastinitis, and acute kidney injury. Through careful monitoring, good communication with perfusionists, and the assurance of appropriate rewarming strategies, anesthesiologists can prevent cerebral hyperthermia.

Clinical Recommendation Statements:

2015 STS/SCA/AECT Guidelines on Temperature Management During Cardiopulmonary Bypass

“Surgical teams should limit arterial outlet blood temperature to <37C to avoid cerebral hyperthermia. (Class I, Level C)”

“Pulmonary artery or NP temperature recording is reasonable for core temperature measurement. (Class IIa, Level C)”

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 1
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Risk Adjustment: No
Care Setting: Hospital Inpatient

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2021 Quality Clinical Data Registry Measure Flow for AQI ID #65: Avoidance of Cerebral Hyperthermia for Procedures Involving Cardiopulmonary Bypass (CPB)

Denominator

Start

Not Included in Eligible Patient Population

Patient aged ≥ 18 Years

Yes

No

Patients Received Services Listed in Denominator

Yes

No

Include in Eligible Population/Denominator (80 procedures)

All temperatures <37.0 degrees Celsius during CPB

Yes

No

At least one temperature ≥ 37.0 degrees Celsius during CPB

Yes

No

No documented temperatures during CPB

Data Completeness Not Met

Data Completeness Met + Performance Met

11A11 (60 procedures)

Data Completeness Met + Performance Not Met

11A12 OR 11A13 (10 procedures)

Numerator

SAMPLE CALCULATIONS

Data Completeness =

Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) = 70 procedures = 87.50%

Eligible Population/Denominator (c=80 procedures) = 80 procedures

Performance Rate =

Performance Met (a=60 procedures) = 60 procedures = 85.71%

Data Completeness Numerator (70 procedures) = 70 procedures

Version 2.0
November 2020
Measure Title
AQI67: Consultation for Frail Patients

Measure Description: Percentage of patients aged 70 years or older, who undergo an inpatient procedure requiring anesthesia services and have a positive frailty screening result who receive a multidisciplinary consult or care during the hospital encounter.

NQS Domain / Meaningful Measures Area
Communication and Care Coordination / Management of Chronic Conditions

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a frail patient undergoes an inpatient procedure during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
Patient demographics, Place of Service codes, CPT codes and Registry codes are used to identify patients who are included in the measure denominator. Registry codes are used to report the numerator.

Denominator: All patients aged 70 years or older, who undergo an inpatient procedure requiring anesthesia services and have a positive frailty screening result

Denominator Definition: Frailty can be screened using an established tool including but not limited to following tools:

- Fried Frailty Phenotype Criteria
- Modified Frailty Index
- The Vulnerable Elders Survey
- Initial Clinical Impression (“First Minute Impression”)”

Denominator Criteria (Eligible Cases):
All patients aged 70 years and older

AND
Place of Service Code: 21

AND
Patient encounter during the reporting period (CPT):
00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00162, 00164, 00170, 00172, 00174, 00176, 00190, 00192, 00210, 00211, 00212, 00214, 00215, 00216, 00218, 00220, 00222, 00300, 00320, 00322, 00350, 00352, 00400, 00402, 00404, 00406, 00410, 00450, 00454, 00470, 00472, 00474, 00500, 00520, 00522, 00524, 00528, 00529,
Positive Frailty Screening Result: 11A14

Denominator Exclusions
- Emergent cases

Numerator: Patients who receive a multidisciplinary consult and/or multidisciplinary care during the hospital encounter

Numerator Definition: A multidisciplinary consult should include documentation of a discussion of the frailty screening result and can include consultation initiated by the anesthesiologist or other qualified anesthesia provider with surgery, geriatrics, hospital medicine, palliative care, or other appropriate specialty to help manage the perioperative care of a frail patient.

Numerator Quality-Data Coding Options for Reporting Satisfactorily

**Performance Met:**

**11A15**

Patient received multidisciplinary consult and/or multidisciplinary care

**OR**

**Performance Not Met:**

**11A16**

Patient did not receive multidisciplinary consult or multidisciplinary care
NQF Number: Not applicable  
eCQM: Not applicable

Rationale

Frailty is a health state that makes a patient particularly vulnerable to stressors, such as surgery. Among elderly surgical patients, frailty has been well-associated with post-operative complications and mortality. While evidence is still evolving regarding appropriate interventions to best manage frailty in the perioperative setting and to optimize patient outcomes, there is agreement that preoperative assessment and identification of frailty is an important first step to ensure coordinated and patient-centric care for the frail patient throughout their perioperative course. Preoperative identification of frailty and appropriate multi-disciplinary consultation allows for the care team to provide appropriate counseling regarding the anticipated outcomes of surgery, better anticipate post-operative complications, and better prepare patients and families for their postoperative course. Multi-disciplinary consultation for frail patients can also allow for the implementation of appropriate team-based care pathways to manage complications such as post-operative delirium, as well as help patients and families define their care goals and expectations.

Clinical Recommendation Statements:


“In the immediate preoperative period the patient’s goals and treatment preferences should be confirmed and documented. Also, during this time, fasting recommendations should be followed, appropriate prophylactic medications should be given, and medications lists should be reviewed for nonessential and inappropriate medications.

The healthcare team can also take this opportunity to begin proactive, postoperative planning, especially with regard to analgesia strategies and minimization of opioids, prevention of functional decline and delirium, early multispecialty consultation where indicated, early involvement of allied health staff such as physical or occupational therapy and anticipating home health needs at discharge.”

2018 Preoperative Frailty Management Recommendations from the Society for Perioperative Assessment and Quality Improvement (SPAQI)

“A positive frailty screen is best followed up with a diagnostic assessment of frailty and when feasible a comprehensive geriatric assessment with a tailored intervention, ideally by a geriatric specialist.”

“The degree of frailty will help select the target population for highly-specialized geriatric co-management programs (involving anesthesiology, surgery, and geriatric medicine) that have already been demonstrated to improve the outcomes of elderly patients in non-elective surgeries.”

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA)/Anesthesia Quality Institute (AQI)


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<th>Description</th>
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<td>Risk Adjustment:</td>
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<td>Care Setting:</td>
<td>Hospital Inpatient</td>
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</table>
2021 Qualified Clinical Data Registry Measure Flow for AQID #67: Consultation for Frail Patients

**Denominator**

- Start
  - Patient aged 70 years and older
    - Yes
      - Place of Service: 21
        - Yes
          - Patient Encounter Listed in Denominator
            - Yes
              - Positive Frailty Screening Result 11A14
                - Yes
                  - Denominator Exclusion
                    - Yes
                      - Emergent Case
                        - No

  - No
    - Not Included in Eligible Patient Population

**Numerator**

- Patient received multidisciplinary consult or care
  - Yes
    - Data Completeness Met + Performance Met 11A15 (60 procedures) a
  - No
    - Patient did NOT receive multidisciplinary consult or care
      - Yes
        - Data Completeness Met + Performance Not Met 11A16 (10 procedures) b
      - No
        - Data Completeness Not Met: Quality-Data Code or equivalent was not submitted (10 procedures)

**SAMPLE CALCULATIONS**

Data Completeness = Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) = 70 procedures / 80 procedures = 87.50%

Performance Rate = Performance Met (a=60 procedures) / Eligible Population / Denominator (c=80 procedures) = 60 procedures / 80 procedures = 85.71%

Data Completeness Numerator (70 procedures) = 70 procedures

Version 2.0
November 2020
Measure Title  
AQI68: Obstructive Sleep Apnea: Mitigation Strategies

Measure Description: Percentage of patients aged 18 years or older, who undergo an elective procedure requiring anesthesia services who are screened for obstructive sleep apnea (OSA) AND, if positive, for whom two or more selected mitigation strategies were used prior to PACU discharge.

NQS Domain / Meaningful Measures Area  
Patient Safety / Preventable Healthcare Harm

Measure Type  
Process

High Priority Status  
Yes

Inverse Measure  
No

Instructions  
This measure is to be reported each time a patient undergoes an elective procedure under anesthesia during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry  
Patient demographics, G-codes and CPT codes are used to identify patients who are included in the measure denominator. Registry Codes are used to capture the numerator.

Denominator: All patients aged 18 years or older, who undergo an elective procedure requiring anesthesia services

Denominator Note: For the purposes of this measure, anesthesia services only include cases using general anesthesia, neuraxial anesthesia and monitored anesthesia care (MAC)

Denominator Criteria (Eligible Cases):  
Patients aged 18 years and older

AND  
Elective procedure: G9643

AND  
Patient encounter during the reporting period (CPT):  
00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00150, 00152, 00154, 00156, 00170, 00172, 00174, 00176, 00190, 00192, 00210, 00211, 00212, 00214, 00215, 00216, 00218, 00220, 00222, 00226, 00228, 00230, 00232, 00234, 00236, 00238, 00240, 00242, 00244, 00246, 00248, 00250, 00252, 00254, 00256, 00258, 00260, 00262, 00264, 00266, 00268, 00270, 00272, 00274, 00276, 00278, 00280, 00282, 00284, 00286, 00288, 00290, 00292, 00294, 00296, 00298, 00300, 00302, 00304, 00306, 00308, 00310, 00312, 00314, 00316, 00318, 00320, 00322, 00324, 00326, 00328, 00330, 00332, 00334, 00336, 00338, 00340, 00342, 00344, 00346, 00348, 00350, 00352, 00354, 00356, 00358, 00360, 00362, 00364, 00366, 00368, 00370, 00372, 00374, 00376, 00378, 00380, 00382, 00384, 00386, 00388, 00390, 00392, 00394, 00396, 00398, 00400, 00402, 00404, 00406, 00410, 00414, 00416, 00418, 00420, 00422, 00424, 00426, 00428, 00430, 00432, 00434, 00436, 00438, 00440, 00442, 00444, 00446, 00448, 00450, 00452, 00454, 00456, 00458, 00460, 00462, 00464, 00466, 00468, 00470, 00472, 00474, 00476, 00478, 00480, 00482, 00484, 00486, 00488, 00490, 00492, 00494, 00496, 00498, 00500, 00502, 00504, 00506, 00508, 00510, 00512, 00514, 00516, 00518, 00520, 00522, 00524, 00526, 00528, 00530, 00532, 00534, 00536, 00538, 00540, 00542, 00544, 00546, 00548, 00550, 00552, 00554, 00556, 00558, 00560, 00562, 00564, 00566, 00568, 00570, 00572, 00574, 00576, 00578, 00580, 00582, 00584, 00586, 00588, 00590, 00592, 00594, 00596, 00598, 00600, 00602, 00604, 00606, 00608, 00610, 00612, 00614, 00616, 00618, 00620, 00622, 00624, 00626, 00628, 00630, 00632, 00634, 00636, 00638, 00640, 00642, 00644, 00646, 00648, 00650, 00652, 00654, 00656, 00658, 00660, 00662, 00664, 00666, 00668, 00670, 00672, 00674, 00676, 00678, 00680, 00682, 00684, 00686, 00688, 00690, 00692, 00694, 00696, 00698, 00700, 00702, 00704, 00706, 00708, 00710, 00712, 00714, 00716, 00718, 00720, 00722, 00724, 00726, 00728, 00730, 00732, 00734, 00736, 00738, 00740, 00742, 00744, 00746, 00748, 00750, 00752, 00754, 00756, 00758, 00760, 00762, 00764, 00766, 00768, 00770, 00772, 00774, 00776, 00778, 00780, 00782, 00784, 00786, 00788, 00790, 00792, 00794, 00796, 00798, 00800, 00802, 00810, 00812, 00814, 00816, 00818, 00820, 00822, 00824, 00826, 00828, 00830, 00832, 00834, 00836, 00838, 00840, 00842,
Denominator Exclusions

- None

Numerator

Patients who are screened for obstructive sleep apnea AND, if positive, have documentation that two or more of the following mitigation strategies were used prior to PACU discharge:

- Preoperative initiation of continuous positive airway pressure (CPAP) or non-invasive positive pressure ventilation (NIPPV)
- Preoperative use of mandibular advancement devices or oral appliances
- Intraoperative administration of CPAP, nasopharyngeal airway, or oral appliance during sedation
- Use of major conduction anesthesia (spinal/epidural) or peripheral nerve block
- Multimodal analgesia
- Extubation while patient is awake
- Verification of full reversal of neuromuscular block
- Extubation and recovery carried out in lateral, semiupright, or other nonsupine position
- Postoperative administration of CPAP, nasopharyngeal airway, or oral appliance in the postanesthesia care unit (PACU)

Numerator Quality-Data Coding Options for Reporting Satisfactorily

**Performance Met: 11A26**

Positive patient screen for OSA OR existing OSA diagnosis AND documentation of two or more mitigation strategies used prior to PACU discharge

**OR**

**Performance Met: 11A27**

Negative patient screen for OSA

**OR**

**Denominator Exception 11A38**

Documentation of medical reason(s) for not screening for obstructive sleep apnea and/or documenting the use of two or more mitigation
strategies (e.g., patient remains intubated postoperatively, listed mitigation strategies contraindicated, other medical reason(s))

OR

Performance Not Met: 11A28
No patient screen for OSA OR positive OSA screen result and documentation of less than 2 mitigation strategies used prior to PACU discharge

NQF Number: Not applicable
eCQM: Not applicable

Rationale
Undiagnosed OSA may pose a variety of problems for anesthesiologists and qualified anesthesia providers. A number of case reports have documented an increase in the incidence of postoperative complications and deaths among patients suspected of having OSA. Untreated OSA patients are known to have a higher incidence of difficult intubation, postoperative complications, increased intensive care unit admissions, and greater duration of hospital stay. Identifying patients with OSA is the first step in preventing postoperative complications due to OSA. Moderate-to-severe sleep apnea is independently associated with a large increased risk of all-cause mortality, incident stroke, and cancer incidence and mortality in this community-based sample. With improved preoperative assessment of OSA risk, anesthesiologists are better able to tailor their care to the individual patient’s needs through a variety of techniques and mitigation strategies.

Clinical Recommendation Statements:

2014 ASA Guidelines on Perioperative Management of Patients with Obstructive Sleep Apnea

“Preoperative initiation of continuous positive airway pressure (CPAP) should be considered, particularly if OSA is severe.

- For patients who do not respond adequately to CPAP, NIPPV should be considered.
The preoperative use of mandibular advancement devices or oral appliances and preoperative weight loss should be considered when feasible.”

“For superficial procedures, consider the use of local anesthesia or peripheral nerve blocks, with or without moderate sedation.

If moderate sedation is used, ventilation should be continuously monitored by capnography or another automated method if feasible because of the increased risk of undetected airway obstruction in these patients.

Consider administering CPCP or using an oral appliance during sedation to patients previously treated with these modalities.”


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“Major conduction anesthesia (spinal/epidural) should be considered for peripheral procedures. Unless there is a medical or surgical contraindication, patients at increased perioperative risk from OSA should be extubated while awake.

Full reversal of neuromuscular block should be verified before extubation. When possible, extubation and recovery should be carried out in the lateral, semiupright, or other nonsupine position.”

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA)/Anesthesia Quality Institute (AQI)

Number of Performance Rates: 1

Proportion Measure Scoring: Yes

Continuous Measure Scoring: No

Risk Adjustment: No

Care Setting: Ambulatory Care: Clinician Office; Ambulatory Care: Hospital; Hospital; Hospital Inpatient; Outpatient Services
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #68: Obstructive Sleep Apnea: Mitigation Strategies

**Denominator**

- Not Included in Eligible Patient Population
- Patient aged ≥ 18 Years
- Elective procedure G9643
- Patient Encounter Listed in Denominator

**Numerator**

- Positive Screen/Existing Diagnosis AND two or more mitigation strategies documented
- Negative Patient Screen for OSA
- Documentation of medical reasons for not screening for OSA and/or documenting the use of two or more mitigation strategies
- No Screen for OSA or Positive Screen/Diagnosis and less than two mitigation strategies

**SAMPLE CALCULATIONS**

Data Completeness = Performance Met (a=50 procedures) + Denominator Exceptions (b=10 procedures) + Performance Not Met (c=10 procedures) = 70 procedures = 87.50%

Performance Rate = Performance Met (a=50 procedures) = 50 procedures = 83.33%

Data Completeness Numerator (70 procedures) – Denominator Exceptions (b=10 procedures) = 60 procedures

Version 2.0
November 2020
Measure Title
AQI69: Intraoperative Antibiotic Redosing

Measure Description
Percentage of patients, aged 18 years and older, who received preoperative antibiotic prophylaxis within 60 minutes prior to incision (if fluoroquinolone or vancomycin, two hours) and undergo a procedure greater than two hours duration who received intraoperative antibiotic redosing at a maximum interval of two half-lives of the selected prophylactic antibiotic.

NQS Domain / Meaningful Measures Area
Patient Safety / Healthcare Associated Infections

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a patient undergoes a surgical procedure lasting greater than two hours duration during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes and patient demographics are used to identify patients who are included in the measure's denominator. Registry codes are used to report the numerator of the measure.

Denominator
All patients, aged 18 years and older, who received preoperative antibiotic prophylaxis within 60 minutes (if fluoroquinolone or vancomycin, two hours) prior to incision and undergo a procedure greater than two hours duration.

Denominator Definition:
For the purpose of this measure, preoperative antibiotic prophylaxis includes, but is not limited to, prophylaxis with the following antimicrobial agents:

- Ampicillin-sulbactam
- Ampicillin
- Aztreonam
- Cefazolin
- Cefuroxime
- Cefotaxime
- Cefotetan
- Cefoxitin
- Clindamycin
- Piperacillin-tazobactam

Denominator Criteria (Eligible Cases):
All patients, aged 18 years and older

**AND**
Patient received antibiotic prophylaxis within 60 minutes (if fluoroquinolone or vancomycin, two hours) prior to incision: **10A87**

**AND**
Procedure >2 hours duration: **11A60**

**AND**
Patient encounter during the reporting period (CPT):
00100, 00102, 00103, 00120, 00124, 00126, 00140, 00144, 00145, 00147, 00160, 00162, 00164, 00170, 00172, 00174, 00176, 00190, 00192, 00210, 00211, 00212, 00214, 00215, 00216, 00218, 00220, 00222, 00300, 00320, 00322, 00350, 00352, 00400, 00402, 00404, 00406, 00410, 00450, 00454, 00470, 00472, 00474, 00500, 00504, 00528, 00529, 00534, 00537, 00539, 00540, 00541, 00542, 00546, 00548, 00550, 00560, 00562, 00563, 00566, 00567, 00580, 00600, 00604, 00620, 00625, 00626, 00630, 00632, 00635, 00640, 00642, 00646, 00648, 00650, 00652, 00654, 00656, 00670, 00700, 00730, 00750, 00752, 00754, 00756, 00770, 00790, 00792, 00794, 00795, 00797, 00800, 00802, 00811, 00820, 00830, 00832, 00840, 00842, 00844, 00846, 00848, 00851, 00860, 00862, 00864, 00865, 00866, 00868, 00870, 00872, 00873, 00880, 00882, 00902, 00904, 00906, 00908, 00910, 00912, 00914, 00916, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00932, 00934, 00936, 00938, 00940, 00942, 00944, 00948, 00950, 00952, 01120, 01140, 01150, 01160, 01170, 01173, 01200, 01202, 01210, 01212, 01214, 01215, 01220, 01230, 01232, 01234, 01250, 01260, 01270, 01272, 01274, 01320, 01340, 01360, 01382, 01390, 01392, 01400, 01402, 01404, 01430, 01432, 01440, 01442, 01444, 01464, 01470, 01472, 01474, 01480, 01482, 01484, 01486, 01500, 01502, 01520, 01522, 01610, 01620, 01622, 01630, 01634, 01636, 01638, 01650, 01652, 01654, 01656, 01670, 01710, 01712, 01714, 01716, 01732, 01740, 01742, 01744, 01756, 01758, 01760, 01770, 01772, 01780, 01782, 01810, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01920, 01924, 01925, 01926, 01930, 01931, 01932, 01933, 01935, 01936, 01951, 01952, 01961, 01962, 01963, 01965, 01966.

**Denominator Exclusions**
- Acute Renal failure**: 11A61**
- Chronic kidney disease**: 11A62**
- Procedure duration <2 half-lives of selected prophylactic antibiotic: **11A63**

**Numerator**
Patients who received intraoperative redosing of prophylactic antibiotics at a maximum interval of two half-lives of the selected prophylactic antibiotic

**Numerator Note:** If multiple redosing windows pass during a procedure, the recommended redosing window is the maximum amount of time that can pass between any two doses in order to meet this measure. Information on dosing and redosing should reflect clinical practice guidelines, local hospital policy, manufacturer guidance, and other materials imperative to safe practice. Antibiotic redosing should occur prior to closing the surgical incision.

**Maximum redosing intervals for included antibiotics are listed below:**

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24 Kidney or renal failure is defined as either: (1) a level of GFR to <15 mL/min/1.73 m2, which is accompanied in most cases by signs and symptoms of uremia, or (2) a need for initiation of kidney replacement therapy (dialysis or transplantation) for treatment for complications of decreased GFR, which would otherwise increase the risk of mortality and morbidity.


• Ampicillin-sulbactam: 2 hours
• Ampicillin: 2 hours
• Aztreonam: 4 hours
• Cefazolin: 4 hours
• Cefuroxime: 4 hours
• Cefotaxime: 3 hours
• Cefoxitin: 2 hours
• Cefotetan: 6 hours
• Clindamycin: 6 hours
• Piperacillin-tazobactam: 2 hours

**Numerator Quality-Data Coding Options for Reporting Satisfactorily**

**Performance Met:**

**11A64** Patient received intraoperative redosing of prophylactic antibiotics at a maximum interval of two half-lives of the selected antibiotic

**OR**

**Performance Met**

**11A65** Patient received intraoperative redosing of prophylactic antibiotics according to facility antibiotic stewardship program.

**OR**

**Performance Not Met:**

**11A66** Patient did not receive intraoperative redosing of prophylactic antibiotics at a maximum interval of two half-lives of the selected antibiotic or according to facility antibiotic stewardship program.

**NQF Number:** Not Applicable

**eCQM:** Not Applicable

**Rationale**

While much attention has been focused on antimicrobial stewardship and reducing hospital-acquired infections in recent years, appropriate intraoperative redosing of antibiotics remains an acknowledged area for improvement\(^{27}\). Maintaining adequate inhibitory antimicrobial concentrations is an important aspect of infection prevention, with procedure length found to be an independent risk factor for developing surgical site infections\(^{28}\). Evidence in the literature has shown wide variation in compliance published recommendations for intraoperative antibiotics, which can be improved through the implementation of multifaceted quality improvement interventions\(^{29,30}\).


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Clinical Recommendation Statements

2013 ASHP/IDSA/SIS/SHEA Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery

“Intraoperative redosing is needed to ensure adequate serum and tissue concentrations of the antimicrobial if the duration of the procedure exceeds two half-lives of the antimicrobial or there is excessive blood loss (i.e., >1500 mL). The redosing interval should be measured from the time of administration of the preoperative dose, not from the beginning of the procedure.”

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 1

Proportion Measure Scoring: Yes

Continuous Measure Scoring: No

Risk Adjustment: No

Care Setting: Hospital


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2021 Quality Clinical Data Registry Measure Flow for AQI ID #69: Intraoperative Antibiotic Redosing

**Denominator**

- **Start**
- **Patient aged ≥ 18 Years**
  - Yes: **Patient received antibiotic prophylaxis within 60 minutes** 10A87
  - No: **Not Included in Eligible Patient Population**
- **Acute renal failure 11A61**
  - Yes: **Data Completeness Met + Performance Met 11A64 OR 11A65 (60 procedures)** a
  - No: **Data Completeness Met + Performance Not Met 11A66 (10 procedures)** b
- **Chronic kidney disease 11A62**
  - Yes: **Data Completeness Not Met Quality-Data Code or equivalent was not submitted (10 procedures)** c
  - No: **Procedure duration < 2 half-lives of selected prophylactic antibiotic 11A63**
    - Yes: **Include in Eligible Population/Denominator (80 procedures)**
    - No: **Procedure > 2 hours duration 11A60**
      - Yes: **Patients Received Services Listed in Denominator**
      - No: **Not Included in Eligible Patient Population**

**Numerator**

**SAMPLE CALCULATIONS**

Data Completeness = Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) = 70 procedures = 87.50%

Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate = Performance Met (a=60 procedures) = 60 procedures = 85.71%

Data Completeness Numerator (70 procedures) = 70 procedures

Version 2.0
November 2020
Measure Title
AQI70: Prevention of Arterial Line-Related Bloodstream Infections

Measure Description
Percentage of patients, regardless of age, who undergo placement of a peripheral intra-arterial catheter for whom the arterial line was inserted with all indicated elements of sterile barrier technique, hand hygiene, skin preparation and, if ultrasound is used, sterile ultrasound techniques followed

The measure will consist of two performance rates:

AQI70a: Percentage of patients, regardless of age, who undergo placement of a peripheral intra-arterial line in the brachial, radial, posterior tibial, or dorsalis pedis artery for whom the arterial line was inserted with all indicated elements of sterile barrier technique, hand hygiene, skin preparation and, if ultrasound is used, sterile ultrasound techniques followed

AQI70b: Percentage of patients, regardless of age, who undergo placement of a peripheral intra-arterial line in the femoral or axillary artery for whom the arterial line was inserted with all indicated elements of maximal sterile barrier technique, hand hygiene, skin preparation and, if ultrasound is used, sterile ultrasound technique is followed

NOTE: The overall measure score will be calculated as an average of the performance rates of part A and part B. In order to be scored on this measure, clinicians must have at least one eligible case reported for both AQI70a and AQI70b.

NQS Domain / Meaningful Measures Area
Patient Safety / Healthcare Associated Infections

Measure Type
Composite

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure consists of two performance rates: AQI70a and AQI70b. Each measure should be reported, as appropriate, for each time a patient undergoes a procedure undergo placement of a peripheral intra-arterial catheter for whom the arterial line was inserted. This measure has two sub-metrics which are used to calculate the total composite score. All sub-metrics are required to be reported during the performance period. In order to be scored on this measure, clinicians must have at least one case reported for both AQI70a and AQI70b. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes and patient demographics are used to identify patients who are included in the measure's denominator. Registry codes are used to report the numerator of the measure.

NQF Number: Not Applicable
Rationale
Arterial lines have been shown to be a significantly under-recognized source of catheter-related bloodstream infections. Though arterial catheter infection rates are similar to those associated with central venous catheters, the use of sterile barrier techniques for arterial line insertion is limited. Appropriate use of sterile techniques is essential to prevent costly and dangerous infections. Furthermore, the insertion of an arterial line in the femoral or axillary artery increases the likelihood of a blood stream infection in adults.32

CLINICAL RECOMMENDATION STATEMENTS:
2011 CDC/HICPAC Guidelines for the Prevention of Intravascular Catheter-Related Infections33

A minimum of a cap, mask, sterile gloves and a small sterile fenestrated drape should be used during peripheral arterial catheter insertion (Category IB)

Use maximal sterile barrier precautions, including the use of a cap, mask, sterile gown, sterile gloves, and a sterile full body drape, for the insertion of CVCs, PICCs, or guidewire exchange. (Category IB)

During axillary or femoral artery catheter insertion, maximal sterile barriers precautions should be used. (Category II)

Prepare clean skin with a >0.5% chlorhexidine preparation with alcohol before central venous catheter and peripheral arterial catheter insertion and during dressing changes. If there is a contraindication to chlorhexidine, tincture of iodine, an iodophor, or 70% alcohol can be used as alternatives (Category IA)

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 3
Propportion Measure Scoring: Yes
Continuous Measure Scoring: No
Risk Adjustment: No
Care Setting: Hospital


AQL70a: Brachial, Radial, Posterior Tibial, or Dorsalis Pedis Arterial Lines

Description
Percentage of patients, regardless of age, who undergo an arterial line insertion in the brachial, radial, posterior tibial, or dorsalis pedis artery for whom the arterial line was inserted with all indicated elements of sterile barrier technique, hand hygiene, skin preparation and, if ultrasound is used, sterile ultrasound techniques followed.

Denominator:
All patients, regardless of age, who undergo placement of an intra-arterial catheter in the brachial, radial, posterior tibial or dorsalis pedis artery

Denominator Criteria (Eligible Cases):
All patients, regardless of age
AND
Patient encounter during the reporting period (CPT): 36620
AND
Intra-arterial catheter placed in brachial, radial, posterior tibial, or dorsalis pedis artery: 11A71

Denominator Exclusions:
None

Numerator:
Patients for whom intra-arterial catheter was inserted with all indicated elements of sterile barrier technique, hand hygiene, skin preparation (including >0.5% chlorhexidine with alcohol, unless there is a contraindication to chlorhexidine), and, if ultrasound is used, sterile ultrasound techniques followed.

Numerator Definitions:
Sterile Barrier Technique: Includes all of the following elements: Cap AND mask AND sterile gloves AND sterile draping.
Sterile Ultrasound Techniques: Require sterile gel and sterile probe covers

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:
11A74 All indicated elements of sterile barrier technique, hand hygiene, skin preparation, and, if ultrasound is used, sterile ultrasound techniques followed

OR

Denominator Exception:
11A75 Documentation of medical reason(s) for not following all indicated elements of sterile barrier technique, hand hygiene, skin preparation, and, if ultrasound is used, sterile ultrasound techniques during intra-arterial catheter insertion (e.g. An emergency surgical, therapeutic, or diagnostic procedure or an unanticipated worsening of the patient's clinical condition so that adherence would cause delay in arterial line insertion resulting in increased risk of harm to patient)

OR
**Performance Not Met:**

11A76  All indicated elements of sterile barrier technique, hand hygiene, skin preparation, and if ultrasound is used, sterile ultrasound techniques not followed, reason not otherwise specified
AQI70b: Femoral and Axillary Arterial Lines

Description:
Percentage of patients, regardless of age, who undergo an arterial line insertion in the femoral or axillary artery for whom the arterial line was inserted with all indicated elements of maximal sterile barrier technique, hand hygiene, skin preparation and, if ultrasound is used, sterile ultrasound techniques followed.

Denominator:
All patients, regardless of age, who undergo placement of an intra-arterial catheter in the femoral or axillary artery

Denominator Criteria (Eligible Cases):
All patients, regardless of age
AND
Patient encounter during the reporting period (CPT): 36620
AND
Intra-arterial catheter placed in femoral or axillary artery: 11A72

Denominator Exclusions:
None

Numerator:
Patients for whom intra-arterial catheter was inserted with all elements of maximal sterile barrier technique, hand hygiene, skin preparation (including >0.5% chlorhexidine with alcohol, unless there is a contraindication to chlorhexidine), and, if ultrasound is used, sterile ultrasound techniques followed

Numerator Definitions:
Maximal Sterile Barrier Technique – includes all of the following elements: Cap AND mask AND sterile gloves AND sterile gown AND sterile full body draping
Sterile Ultrasound Techniques- Require sterile gel and sterile probe covers

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:

11A77 All elements of maximal sterile barrier technique, hand hygiene, skin preparation, and, if ultrasound is used, sterile ultrasound techniques followed.

OR

Denominator Exception:

11A78 Documentation of medical reason(s) for not following all elements of maximal sterile barrier technique, hand hygiene, skin preparation, and, if ultrasound is used, sterile ultrasound techniques during intra-arterial catheter insertion (e.g. An emergency surgical, therapeutic, or diagnostic procedure or an unanticipated worsening of the patient’s clinical condition so that adherence would cause delay in arterial line insertion resulting in increased risk of harm to patient).

OR
Performance Not Met:

11A79 All elements of maximal sterile barrier technique, hand hygiene, skin preparation, and if ultrasound is used, sterile ultrasound techniques not followed, reason not otherwise specified.
2021 Quality Clinical Data Registry Measure Flow for AQI ID #70a:
Prevention of Arterial Line Related Bloodstream Infections:
Brachial, Radial, Posterior Tibial, or Dorsalis Pedis Arterial Lines

**Multiple Submission Criteria**

**Denominator a**
- Not Included in Eligible Patient Population
- All patients, regardless of age
- Patients Received Services Listed in Denominator
- Intra-Arterial Catheter Placed in Designated location

**Numerator a**
- Sterile Barrier Technique Followed
- Documentation of medical reasons for not following sterile barrier technique
- Sterile Barrier Technique NOT Followed

**SAMPLE CALCULATIONS**

Data Completeness =
Performance Met (a=50 procedures) + Denominator Exceptions (b=10 procedures) + Performance Not Met (c=10 procedures) = 70 procedures  = 87.50%
Eligible Population / Denominator (d=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=50 procedures) = 50 procedures  = 83.33%

Data Completeness Numerator (70 procedures) – Denominator Exceptions (b=10 procedures) = 60 procedures

Version 2.0
November 2020
2021 Quality Clinical Data Registry Measure Flow for AQI ID #70b: Prevention of Arterial Line Related Bloodstream Infections: Femoral and Axillary Arterial Lines

START

Denominator b

All patients, regardless of age

Patients Received Services Listed in Denominator

Intra-arterial Catheter placed in femoral or axillary artery

Include in Eligible Population/Denominator (80 procedures)

Numerator b

Data Completeness Met + Performance Met 11A77 (55 procedures) a

Maximal Sterile Barrier Technique Followed

Yes

Data Completeness Met + Denominator Exception 11A78 (5 procedures) b

No

Documentation of medical reasons for not following maximal sterile barrier technique

Yes

Data Completeness Met + Performance Not Met 11A79 (10 procedures) c

No

Maximal Sterile Barrier Technique NOT Followed

Yes

Data Completeness Not Met Quality-Data Code or equivalent was not submitted (10 procedures)

SAMPLE CALCULATIONS

Data Completeness = Performance Met (a=55 procedures) + Denominator Exceptions (b=5 procedures) + Performance Not Met (c=10 procedure) = 70 procedures = 87.50%

Eligible Population / Denominator (d=80 procedures)

Performance Rate = Performance Met (a=55 procedures) / Eligible Population / Denominator (d=80 procedures) = 55 procedures / 80 procedures = 84.62%

Data Completeness Numerator (70 procedures) – Denominator Exceptions (b=5 procedures) = 65 procedures

SAMPLE OVERALL PERFORMANCE RATE CALCULATION

Overall Performance Rate = Brachial, Radial, Posterior Tibial, Dorsalis Pedis Arterial Line Performance Rate (83.33%) + Femoral and Axillary Arterial Lines (84.62%) = 167.95 / 2 = 83.98%

Version 2.0
November 2020
Measure Title
AQI71: Ambulatory Glucose Management

Measure Description
Percentage of diabetic patients, aged 18 years and older, who receive an office-based or ambulatory surgery whose blood glucose level is appropriately managed throughout the perioperative period.

This measure will consist of four performance rates:

AQI71a: Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery whose blood glucose level is tested prior to the start of anesthesia.

AQI71b: Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who experienced a blood glucose level >180 mg/dL (10.0 mmol/L) who received insulin prior to anesthesia end time.

AQI71c: Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who received insulin perioperatively and who received a follow-up blood glucose level check following the administration of insulin and prior to discharge.

AQI71d: Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who experienced a blood glucose level >180 mg/dL (10.0 mmol/L) who received education on managing their glucose in the postoperative period prior to discharge.

**NOTE:** The overall measure score will be calculated as an average of the performance rates of parts A, B, C and D. In order to be scored on this measure, clinicians must have at least one eligible case reported for each sub-metric: AQI71a, AQI71b, AQI71c, and AQI71d.

NQS Domain / Meaningful Measures Area
Effective Clinical Care / Healthcare Associated Infections

Measure Type
Composite

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure will consist of four performance rates: AQI71a, AQI71b, AQI71c, and AQI71d. Each measure should be reported, as appropriate, for each time a patient undergoes a procedure in an office-based or ambulatory setting during the reporting period. This measure has four sub-metrics which are used to calculate the total composite score. All sub-metrics are required to be reported during the performance period. In order to be scored on this measure, clinicians must have at least one eligible case reported for
AQI71a, AQI71b, AQI71c, and AQI71d. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

**Measure Reporting via the Qualified Clinical Data Registry**

CPT codes and patient demographics are used to identify patients who are included in the measure’s denominator. Registry codes are used to report the numerator of the measure.

**NQF Number:** Not Applicable

**eCQM:** Not Applicable

**Rationale**

Diabetes mellitus has been shown to be an important risk factor for surgical site infection and other surgical complications. With increasingly complex procedures being performed in an ambulatory setting, perioperative glucose management is an important aspect of ambulatory anesthesia care. For diabetic patients, preoperative testing of blood glucose levels can provide an important indicator for their intraoperative insulin and care management needs. Despite the importance of glucose testing, evidence shows that it is not consistently performed in the ambulatory setting. Improved preoperative glucose testing can help anesthesia providers better anticipate and manage the needs of their diabetic patients throughout the perioperative period.

**CLINICAL RECOMMENDATION STATEMENTS:**

2010 SAMBA Consensus Statement on Perioperative Blood Glucose Management in Diabetic Patients Undergoing Ambulatory Surgery

“Ambulatory surgical facilities taking care of diabetic patients must have glucose monitoring capabilities such as point-of-care monitors. Adequate monitoring of blood glucose levels is critical in maintaining patient safety and should facilitate insulin titration to achieve optimal blood glucose levels as well as allow for early detection of hypoglycemia. It has been suggested that blood glucose levels should be checked on the patient’s arrival to the facility before surgery and before discharge home (LoE category 2A).”

Perioperative administration of Insulin to patients with hyperglycemia, has been shown to improve clinical outcomes by decreasing the incidence of surgical site infections and hyperglycemia in the post-anesthesia care unit. Blood glucose values of 180mg/dL (10 mmol/L) or higher are treated with insulin. Target range for the perioperative period is 140-180 mg/dL (7.7-10 mmol/L).

The Society for Ambulatory Anesthesia (SAMBA) recommends intraoperative blood glucose levels <180 mg/dL (10 mmol/l). The American Association of Clinical Endocrinologists (AACE) Task Force and the American Diabetes Association (ADA) recommend target glucose levels between 140 and 180 mg/dL (7.7-10 mmol/l) in critically ill patients. The Society of Critical Care Medicine (SCCM) advises treatment be triggered at blood glucose levels ≥ 150 mg/dl (8.3 mmol/l0 with a goal to maintain blood glucose below that level, and absolutely <180 mg/dL (10 mmol/l). The Society of Thoracic Surgeons (STS) Practice Guidelines


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recommend maintaining serum glucose levels \( \leq 180\text{mg/dL} \) (10 mmol/l) for at least 24 hours after cardiac surgery. The Endocrine Society and SAMBA recommend that intraoperative blood glucose levels be maintained \(<180\text{mg/dL} \).^{38}

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 5

Proportion Measure Scoring: Yes

Continuous Measure Scoring: No

Risk Adjustment: No

Care Setting: Ambulatory Care: Hospital

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AQI71a: Ambulatory Point-of-Care Glucose Testing

Description
Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery whose blood glucose level is tested prior to the start of anesthesia.

Denominator:
All patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery

Denominator definition: Office-based and ambulatory surgery is defined as a therapeutic or diagnostic procedure performed in a healthcare facility that does not require an overnight stay (less than 24 hours of care)

Denominator Criteria (eligible cases):

AND
Off Campus-Outpatient Hospital, On Campus – Outpatient Hospital, Ambulatory Surgical Center, and Office-Based Setting: Place of Service Codes 11, 19, 22 or 24
AND
Patient encounter during the reporting period (CPT): 00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00164, 00170, 00172, 00174, 00176, 00300, 00320, 00322, 00400, 00402, 00404, 00410, 00450, 00454, 00520, 00522, 00524, 00530, 00532, 00534, 00537, 00700, 00702, 00730, 00731, 00732, 00750, 00752, 00790, 00797, 00800, 00802, 00811, 00812, 00813, 00820, 00830, 00832, 00835, 00851, 00870, 00872, 00873, 00902, 00906, 00910, 00912, 00914, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00938, 00940, 00942, 00944, 00948, 00950, 00952, 01112, 01120, 01202, 01250, 01260, 01320, 01380, 01382, 01390, 01392, 01400, 01402, 01404, 01464, 01470, 01472, 01474, 01480, 01520, 01610, 01620, 01622, 01630, 01634, 01638, 01670, 01710, 01712, 01714, 01716, 01730, 01732, 01740, 01742, 01744, 01758, 01760, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01930, 01935, 01936, 01965, 01966, 01991, 01992

Denominator Exclusions:
• Procedure <30 minutes duration: 11A45

Numerator:
Patients who received a blood glucose test prior to the start of anesthesia

Numerator Quality-Data Coding Options for Reporting Satisfactorily
Performance Met:

11A51 Patient received a blood glucose test prior to start of anesthesia

OR

Performance Not Met:

11A52 Patient did NOT receive a glucose test prior to start of anesthesia
AQI71b: Ambulatory Hyperglycemia Control

Description
Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who experienced a blood glucose level >180 mg/dL (10.0 mmol/L) who received insulin prior to anesthesia end time.

Denominator:
All patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who experienced a blood glucose level >180 mg/dL (10.0 mmol/L)

Denominator definition: Office-based and ambulatory surgery is defined as a therapeutic or diagnostic procedure performed in a healthcare facility that does not require an overnight stay (less than 24 hours of care)

Denominator Criteria (Eligible Cases):
All patients, aged 18 years and older
AND
Diagnosis of diabetes mellitus: 11A41
OR
AND
Off Campus-Outpatient Hospital, On Campus – Outpatient Hospital, Ambulatory Surgical Center, and Office-Based Setting: Place of Service Codes 11, 19, 22 or 24

AND
Experienced a blood glucose level >180 mg/dL (10.0 mmol/L) prior to anesthesia end time: 11A44

AND
Patient encounter during the reporting period (CPT): 00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00164, 00170, 00172, 00174, 00176, 00300, 00320, 00322, 00400, 00402, 00404, 00410, 00450, 00454, 00520, 00522, 00524, 00526, 00530, 00532, 00534, 00537, 00700, 00702, 00730, 00731, 00732, 00750, 00752, 00754, 00770, 00790, 00800, 00802, 00811, 00812, 00813, 00820, 00830, 00832, 00851, 00870, 00872, 00873, 00902, 00906, 00910, 00912, 00914, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00938, 00940, 00942, 00944, 00948, 00950, 00952, 01112, 01120, 01202, 01250, 01260, 01320, 01380, 01382, 01390, 01392, 01400, 01402, 01404, 01464, 01470, 01472, 01474, 01480, 01520, 01610, 01620, 01622, 01630, 01634, 01638, 01670, 01710, 01712, 01714, 01716, 01730, 01732, 01740, 01742, 01744, 01758, 01760, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01930, 01935, 01936, 01965, 01966, 01991, 01992

Denominator Exclusions:
- Procedure <30 minutes duration: 11A45

Numerator:
Patients who received insulin prior to anesthesia end time.

Numerator Quality-Data Coding Options for Reporting Satisfactorily
Performance Met:

11A53 Patient received insulin prior to anesthesia end time.

OR

Performance Not Met:

11A54 Patient did NOT receive insulin prior to anesthesia end time.
AQI71c: Follow-Up Glucose Check for Patients Receiving Insulin

Description
Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who received insulin perioperatively and who received a follow-up blood glucose level check following the administration of insulin and prior to discharge.

Denominator:
All patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who received insulin perioperatively

Denominator definition: Office-based and ambulatory surgery is defined as a therapeutic or diagnostic procedure performed in a healthcare facility that does not require an overnight stay (less than 24 hours of care)

Denominator Criteria (Eligible Cases):
All patients, aged 18 years and older
AND
Diagnosis of diabetes mellitus: 11A41
OR

AND
Off Campus-Outpatient Hospital, On Campus – Outpatient Hospital, Ambulatory Surgical Center, and Office-Based Setting: Place of Service Codes 11, 19, 22 or 24
AND
Patient received insulin perioperatively: 11A55

AND
Patient encounter during the reporting period (CPT): 00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00164, 00170, 00172, 00174, 00176, 00300, 00320, 00322, 00400, 00402, 00404, 00410, 00450, 00454, 00520, 00522, 00524, 00530, 00532, 00534, 00537, 00700, 00702, 00730, 00731, 00732, 00750, 00752, 00790, 00797, 00800, 00802, 00811, 00812, 00813, 00820, 00830, 00832, 00851, 00870, 00872, 00873, 00902, 00906, 00910, 00912, 00914, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00938, 00940, 00942, 00944, 00948, 00950, 00952, 01112, 01120, 01202, 01250, 01260, 01320, 01380, 01382, 01390, 01392, 01400, 01402, 01404, 01464, 01470, 01472, 01474, 01480, 01520, 01610, 01620, 01622, 01630, 01634, 01638, 01670, 01710, 01712, 01714, 01716, 01730, 01732, 01740, 01742, 01744, 01758, 01760, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01930, 01935, 01936, 01965, 01966, 01991, 01992

Denominator Exclusions:
• Procedure <30 minutes duration: 11A45

Numerator:
Patients who received a follow-up blood glucose level check following the administration of insulin and prior to discharge.

Numerator Quality-Data Coding Options for Reporting Satisfactorily
Performance Met:

11A56 Patient received a follow-up blood glucose level check following the administration of insulin and prior to discharge.

OR

Performance Not Met:

11A57 Patient did NOT receive a follow-up blood glucose level check following the administration of insulin and prior to discharge.
AQI71d: Hyperglycemia Management Patient Education

Description
Percentage of patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who experienced a blood glucose level >180 mg/dL (10.0 mmol/L) who received education on managing their glucose in the postoperative period prior to discharge.

Denominator:
All patients, aged 18 years and older, with a current diagnosis of diabetes mellitus receiving anesthesia services for office-based or ambulatory surgery who experienced a blood glucose level >180 mg/dL (10.0 mmol/L).

Denominator definition: Office-based or ambulatory surgery is defined as a therapeutic or diagnostic procedure performed in a healthcare facility that does not require an overnight stay (less than 24 hours of care).

Denominator Criteria (Eligible Cases):
All patients, aged 18 years and older
AND
Diagnosis of diabetes mellitus: 11A41
OR
AND
Off Campus-Outpatient Hospital, On Campus – Outpatient Hospital, Ambulatory Surgical Center, and Office-Based Setting: Place of Service Codes 11, 19, 22 or 24

AND
Experienced a blood glucose level >180 mg/dL (10.0 mmol/L) prior to anesthesia end time: 11A44

AND
Patient encounter during the reporting period (CPT): 00100, 00102, 00103, 00104, 00120, 00124, 00126, 00140, 00142, 00144, 00145, 00147, 00148, 00160, 00164, 00170, 00172, 00174, 00176, 00300, 00320, 00322, 00400, 00402, 00404, 00410, 00450, 00454, 00520, 00522, 00524, 00530, 00532, 00534, 00537, 00700, 00702, 00730, 00731, 00732, 00750, 00752, 00754, 00790, 00797, 00800, 00802, 00811, 00812, 00813, 00820, 00830, 00832, 00834, 00836, 00870, 00872, 00873, 00902, 00906, 00910, 00912, 00914, 00918, 00920, 00921, 00922, 00924, 00926, 00928, 00930, 00938, 00940, 00942, 00944, 00948, 00950, 00952, 01112, 01120, 01202, 01204, 01206, 01320, 01390, 01392, 01400, 01402, 01404, 01464, 01470, 01472, 01474, 01480, 01520, 01610, 01620, 01622, 01630, 01634, 01638, 01670, 01710, 01712, 01714, 01716, 01730, 01732, 01740, 01742, 01744, 01758, 01760, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01930, 01935, 01936, 01965, 01966, 01991, 01992

Denominator Exclusions:
• Procedure <30 minutes duration: 11A45

Numerator:
Patients who received education on managing their glucose in the postoperative period prior to discharge

Numerator Note: To meet this measure, the anesthesiologist or other member of the care team must provide both oral and written education. Provision of written materials alone is not sufficient.

Numerator Quality-Data Coding Options for Reporting Satisfactorily
Performance Met:

11A58 Patient received education on managing their glucose in the postoperative period prior to discharge.

OR

Performance Not Met:

11A59 Patient did NOT receive education on managing their glucose in the postoperative period prior to discharge.
**2021 Qualified Clinical Data Registry Measure Flow for AQI ID #71a:**

**Ambulatory Glucose Management:**

**Ambulatory Point-of-Care Glucose Testing**

---

**Denominator**

- Start
  - Patient aged ≥ 18 Years
    - Yes
      - Diagnosis of diabetes mellitus 11A41 or appropriate ICD10 code
        - Yes
          - Place of Service Code 11, 19, 22, or 24
            - Yes
              - Patient Encounter Listed in Denominator
                - Yes
                  - Procedure < 30 minutes duration 11A45
                    - Yes
                      - Denominator Exclusion
                        - Yes
                      - No
                        - No
        - No
          - Patient did NOT receive a blood glucose test
            - Yes
              - Data Completeness Met + Performance Not Met 11A52 (10 procedures)
                - Yes
                - No
                - No
              - Data Completeness Not Met Quality-Data Code or equivalent was not submitted (10 procedures)
                - Yes
                - No
            - No
              - Data Completeness Met + Performance Met 11A51 (60 procedures)
                - Yes
                - No
          - No
    - No

**Numerator**

- Patient received a blood glucose test
  - Yes
  - No

**SAMPLE CALCULATIONS**

Data Completeness = Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) = 70 procedures = 87.50%

 Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate = 60 procedures = 85.71%

Data Completeness Numerator (70 procedures) = 70 procedures

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2021 Qualified Clinical Data Registry Measure Flow for AQJ ID #71b:
Ambulatory Glucose Management:
Ambulatory Hyperglycemia Control

**Denominator**

Start

- Not Included in Eligible Patient Population

- Patient aged ≥ 18 Years
  - Yes
  - Diagnosis of diabetes mellitus
    - 11A41 or appropriate ICD10 code
  - No

- Place of Service Code
  - 11, 19, 22, or 24

- Patient Encounter Listed in Denominator

- Experienced a blood glucose level > 180 mg/dL
  - Yes

- Procedure < 30 minutes duration
  - Yes

- Include in Eligible Population/Denominator
  - (80 procedures)

**Numerator**

- Patient received insulin prior to anesthesia end time
  - Yes
  - Data Completeness Met + Performance Met
    - 11A53 (45 procedures)
  - No

- Patient did NOT receive insulin prior to anesthesia end time
  - Yes
  - Data Completeness Met + Performance Not Met
    - 11A54 (25 procedures)
  - No

- Data Completeness Not Met
  - Quality-Data Code or equivalent was not submitted
  - (10 procedures)

**Multiple Submission Criteria**

- Data Completeness Met + Performance Met
  - 11A53 (45 procedures)
  - Data Completeness Met + Performance Not Met
  - 11A54 (25 procedures)
  - Data Completeness Not Met
  - Quality-Data Code or equivalent was not submitted
  - (10 procedures)

**SAMPLE CALCULATIONS**

Data Completeness =

Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures)

Eligible Population / Denominator (c=80 procedures)

= 70 procedures

= 87.50%

Performance Rate =

Performance Met (a=45 procedures) / Eligible Population / Denominator (c=80 procedures)

= 45 procedures

= 64.29%

Data Completeness Numerator (70 procedures) =

70 procedures

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2021 Qualified Clinical Data Registry Measure Flow for AQI ID #71c:
Ambulatory Glucose Management:
Follow-Up Glucose Check for Patients Receiving Insulin

**Multiple Submission Criteria**

- Place of Service Code 11, 19, 22, or 24
- Procedure < 30 minutes duration

**SAMPLE CALCULATIONS**

Data Completeness =
\[
\frac{\text{Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures)}}{\text{Eligible Population / Denominator (c=80 procedures)}} = \frac{70 \text{ procedures}}{80 \text{ procedures}} = 87.50\%
\]

Performance Rate =
\[
\frac{\text{Performance Met (a=45 procedures)}}{\text{Eligible Population / Denominator (c=80 procedures)}} = \frac{45 \text{ procedures}}{80 \text{ procedures}} = 64.29\%
\]

Data Completeness Numerator (70 procedures) = 70 procedures

**Denominator**

- Not Included in Eligible Patient Population
- Patient aged ≥ 18 Years
- Diagnosis of diabetes mellitus 11A41 or appropriate ICD10 code
- Place of Service Code 11, 19, 22, or 24
- Patient Encounter Listed in Denominator
- Patient received insulin perioperatively 11A55
- Procedure < 30 minutes duration 11A45

**Numerator**

- Patient received a follow-up blood glucose level check
- Patient did NOT receive a follow-up blood glucose level check

Data Completeness Met + Performance Met 11A56 (45 procedures)  
Data Completeness Met + Performance Not Met 11A57 (25 procedures)  
Data Completeness Not Met Quality-Data Code or equivalent was not submitted (10 procedures)
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #71d:
Ambulatory Glucose Management:
Hyperglycemia Management Patient Education

Multiple Submission Criteria

Denominator

Start

Not Included in Eligible Patient Population

Patient aged ≥ 18 Years

Yes

Diagnosis of diabetes mellitus 11A41 or appropriate ICD10 code

No

Place of Service Code 11, 19, 22, or 24

Yes

Patient Encounter Listed in Denominator

No

Experienced a blood glucose level > 180 mg/dL 11A44

Yes

Procedure < 30 minutes duration 11A45

No

Denominator Exclusion

Numerator

Patient received education on managing their glucose

Yes

Data Completeness Met + Performance Met 11A58 (45 procedures) a

No

Patient did not receive education managing their glucose

Yes

Data Completeness Met + Performance Not Met 11A59 (25 procedures) b

No

Data Completeness Not Met Quality-Data Code or equivalent was not submitted (10 procedures)

Include in Eligible Population/Denominator (80 procedures) c

SAMPLE CALCULATIONS

Data Completeness =
Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures) = 70 procedures = 87.50%
Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=45 procedures) = 45 procedures = 64.29%

Data Completeness Numerator (70 procedures) = 70 procedures

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### 2021 Qualified Clinical Data Registry Measure Flow for AQI ID #71:
Ambulatory Glucose Management:
Sample Overall Calculation

### Multiple Submission Criteria

<table>
<thead>
<tr>
<th>SAMPLE CALCULATIONS: Ambulatory Point-of-Care Glucose Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Completeness = Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) = 70 procedures = 87.50%</td>
</tr>
<tr>
<td>Eligible Population / Denominator (c=80 procedures) = 80 procedures</td>
</tr>
<tr>
<td>Performance Rate = Performance Met (a=60 procedures) = 60 procedures = 85.71%</td>
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<tr>
<td>Data Completeness Numerator (70 procedures) = 70 procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAMPLE CALCULATIONS: Ambulatory Hyperglycemia Control</th>
</tr>
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<tbody>
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<td>Data Completeness = Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures) = 70 procedures = 87.50%</td>
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<tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAMPLE CALCULATIONS: Follow-Up Glucose Check for Patients Receiving Insulin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Completeness = Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures) = 70 procedures = 87.50%</td>
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<tr>
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<tr>
<td>Data Completeness Numerator (70 procedures) = 70 procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAMPLE CALCULATIONS: Hyperglycemia Management Patient Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Completeness = Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures) = 70 procedures = 87.50%</td>
</tr>
<tr>
<td>Eligible Population / Denominator (c=80 procedures) = 80 procedures</td>
</tr>
<tr>
<td>Performance Rate = Performance Met (a=45 procedures) = 45 procedures = 64.29%</td>
</tr>
<tr>
<td>Data Completeness Numerator (70 procedures) = 70 procedures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAMPLE CALCULATIONS: Sample Overall Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Rate = Ambulatory Point-of-Care Glucose Testing Performance Rate (85.71%) + Ambulatory Hyperglycemia Control Performance Rate (87.50%) + Follow-Up Glucose Check for Patients Receiving Insulin Performance Rate (75.00%) + Hyperglycemia Management Patient Education Performance Rate (75.00%)</td>
</tr>
<tr>
<td>Performance Rate = 85.71% + 64.29% + 64.29% + 64.29% = 278.58 / 4 = 69.65%</td>
</tr>
</tbody>
</table>

**Version 2.0**

**November 2020**
Measure Title
AQI72: Perioperative Anemia Management

Measure Description
Percentage of patients, aged 18 years and older, undergoing elective total joint arthroplasty who were screened for anemia preoperatively AND, if positive, have documentation that one or more of the following management strategies were used prior to PACU discharge.

Management strategies include one or more of the following:
- Cell salvage techniques employed intraoperatively
- Intraoperative antifibrinolytic therapy or tourniquet, if not contraindicated
- Preoperative iron supplementation, epoetin alpha
- Use of evidence-based preoperative anemia management algorithm supplemented with laboratory testing and/or multidisciplinary consult

NQS Domain / Meaningful Measures Area
Patient Safety / Preventable Healthcare Harm

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a patient undergoes an elective total joint arthroplasty procedure during the reporting period. It is anticipated that qualified anesthesia providers and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes are used to identify patients who are included in the measure denominator. Registry codes are used to report the numerator of the measure.

Denominator
Patients, aged 18 years and older, undergoing elective total joint arthroplasty.

Denominator Note: For the purpose of this measure, total joint arthroplasty includes arthroplasty of the knee, hip, and shoulder.

Denominator Criteria (Eligible Cases):
All patients, aged 18 years and older
AND
Elective Surgery: G9643
AND
Patient encounter during the reporting period (CPT): 01214, 01215, 01402, 01638
**Denominator Exclusions**  
Surgeon or other non-anesthesia professional clinician completed one or more of the management strategies without direction or assistance from the anesthesia professional: 11A80

**Numerator**  
Patients who were screened for anemia preoperatively AND, if positive, have documentation that one or more of the following management strategies were used prior to PACU discharge.

*Management strategies include one or more of the following:*  
- Cell salvage techniques employed intraoperatively  
- Intraoperative antifibrinolytic therapy or tourniquet, if not contraindicated  
- Preoperative iron supplementation, *epoetin alpha*  
- Use of evidence-based preoperative anemia management algorithm supplemented with laboratory testing and/or multidisciplinary consult

*Numerator definition:* For the purpose of this measure, a positive preoperative anemia screening result is defined as a Hgb value <13 gm/dL for men or Hgb value <12 gm/dL for women

*Numerator note:* Preoperative screening for anemia could include any of the following tests: complete blood count (CBC), arterial blood gas (ABG), venous blood gas (VBG), or other point of care hemoglobin/hematocrit test within 90 days and until one day prior to the surgical procedure.

**Numerator Quality-Data Coding Options for Reporting Satisfactorily**

*Performance Met:*

11A67 Patient was screened for anemia preoperatively AND documentation of one or more selected management strategies used prior to PACU discharge.

OR

*Denominator Exception:*

11A68 Negative preoperative anemia screening result.

OR

*Denominator Exception:*

11A69 Documentation of medical or patient reason(s) for not screening for anemia and/or using selected management strategies (e.g., Jehovah’s witness, patient refusal, contraindication, etc).

OR

*Performance Not Met:*

11A70 No preoperative patient screen for anemia OR positive preoperative anemia screening result and no documentation of one or more selected management strategies used prior to PACU discharge.

*NQF Number:* Not Applicable
Rationale
Anemia is a common complication of many chronic illnesses that interferes with iron absorption. It has been estimated that at least one-third of patients undergoing non-emergent surgical procedures have potentially treatable anemia. Preoperative anemia is associated with increased need for perioperative blood transfusion as well as significant perioperative morbidity and mortality. Appropriate preoperative anemia management can reduce the risk of perioperative blood transfusion, help identify co-morbidities, and improve perioperative outcomes by improving patients' readiness for surgery. The 2015 American Society of Anesthesiologists Guideline on Perioperative Blood Management indicate “TEG and ROTEM-guided algorithms are shown to be effective in reducing blood transfusion requirements.” Additionally, studies have found that preoperative anemia has been associated with postoperative joint infections. The preoperative screening for anemia would reduce the number of post-operative joint infections.” More resources can be found at the American Association of Blood Banks.

The purpose of this measure is to drive quality changes within perioperative anemia management. Testing algorithms may not be available in all practices. Those that do not have testing algorithms should use a different strategy to fulfill requirements of this measure.

Clinical Recommendation Statements
2015 ASA Practice Guidelines for Perioperative Blood Management
“Review available laboratory test results including hemoglobin, hematocrit, and coagulation profiles. Order additional laboratory tests depending on a patient's medical condition (e.g., coagulopathy, anemia.”

“Erythropoietin with or without iron may be administered when possible to reduce the need for allogenic blood in selected patient populations (e.g., renal insufficiency, anemia of chronic disease, refusal of transfusion). Administer iron to patients with iron deficiency anemia if time permits.”

“If anemia is suspected, monitor hemoglobin/hematocrit values based on estimated blood loss and clinical signs.”

Data Source: Claims/Paper Medical Record, Registry

Measure Steward: American Society of Anesthesiologists (ASA) / Anesthesia Quality Institute (AQI)

Number of Performance Rates: 1
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No

<table>
<thead>
<tr>
<th>Risk Adjustment:</th>
<th>No</th>
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<tr>
<td>Care Setting:</td>
<td>Hospital</td>
</tr>
</tbody>
</table>
2021 Qualified Clinical Data Registry Measure Flow for AQI ID #72: Perioperative Anemia Management

**Denominator**
- Not Included in Eligible Patient Population
- Patient aged ≥ 18 Years
- Elective Surgery G9643
- Patient Encounter Listed in Denominator
- Non-Anesthesia professional completed management strategy 11A80

**Numerator**
- Patient had positive anemia screen & management strategy
- Negative anemia screen
- Documentation of medical reasons or patient refusal
- No anemia screen or management strategy used

**SAMPLE CALCULATIONS**

Data Completeness = Performance Met (a=50 procedures) + Denominator Exception (b=10 procedures) + Performance Not Met (c=10 procedures) / Eligible Population / Denominator (d=80 procedures) = 70 procedures / 80 procedures = 87.50%

Performance Rate = Performance Met (a=50 procedures) / Eligible Population (70 procedures) = 50 procedures / 70 procedures = 83.33%

Data Completeness Numerator (70 procedures) - Denominator Exceptions (b=10 procedures) = 60 procedures
Measure Title
Quantum31: Central Line Ultrasound Guidance

*ASA LICENSED THIS MEASURE FROM MEDNAX*

Measure Description
Percentage of patients, regardless of age, in whom ultrasound guidance is used by the clinician when placing a central line for those central lines that are placed in the internal jugular location.

NQS Domain / Meaningful Measures Area
Patient Safety / Preventable Healthcare Harm

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions
This measure is to be reported each time a clinician places a central line in the internal jugular location (de novo placement). Performance of this metric requires clinician documentation that ultrasound guidance was performed at the time of central line placement.

Measure Reporting via the Qualified Clinical Data Registry
CPT codes and patient demographics are used to identify patients who are included in the measure's denominator. Registry codes are used to report the numerator of the measure.

Denominator
All patients, regardless of age, who undergo internal jugular central line placement by the clinician.

Denominator Criteria (Eligible Cases):
All patients, regardless of age

AND
Patient encounter during the reporting period (CPT):
36555, 36556, 36557, 36558, 36560, 36561, 36563, 36565, 36566, 93503

AND
Internal jugular site insertion 10A66

Denominator Exclusions / Exceptions
- Tunneled placement through same, existing site as previously placed and currently indwelling non-tunneled placement. 11A39

Numerator
Use of ultrasound guidance during the central line insertion when central line is placed at the internal jugular site.
Numerator Quality-Data Coding Options for Reporting Satisfactorily

**Performance Met:**

10A67 Clinician used ultrasound guidance during central line placement when internal jugular site used.

**OR**

**Performance Not Met:**

10A68 Clinician did not use ultrasound guidance during central line placement when internal jugular site used.

NQF Number: Not Applicable

eCQM: Not Applicable

**Rationale**

The use of ultrasound to guide central venous cannulation has been shown to decrease adverse events including but not limited to decreased risks of cannulation failure, arterial puncture, hematoma, and hemothorax. Benefits that relate to ultrasound guidance are most appreciable for internal jugular site insertion in contrast to either subclavian or femoral insertion.\(^43,44,45,46\)

Data Source: Claims, Medical Record, Registry

Measure Steward: MEDNAX Services, Inc.

Number of Multiple Performance Rates: Not applicable

Proportion Measure Scoring: Yes

Continuous Measure Scoring: No

Risk Adjustment: No

Care Setting: Hospital


Measure Title
ePreop31: Intraoperative Hypotension among Non-Emergent Noncardiac Surgical Cases

*ASA LICENSED THIS MEASURE FROM ePreop*

Measure Description
Percentage of general anesthesia cases in which mean arterial pressure (MAP) fell below 65 mmHg for cumulative total of 15 minutes or more.

NQS Domain / Meaningful Measures Area
Patient Safety / Preventable Healthcare Harm

Measure Type
Intermediate Outcome

High Priority Status
Yes

Inverse Measure
Yes

- A lower score indicates better quality. Note that providers are not expected to receive a score of zero on the measure, because some patients could have a MAP that falls below 65 for reasons outside a provider’s control.

Instructions
This measure evaluates the proportion of cases in which the patient’s MAP is below 65 mmHg for 15 minutes or more, cumulatively over the course of the surgery. The numerator condition is met when MAP is below 65 mmHg for one continuous period lasting 15 minutes or more, or if the patient has several discrete periods with a MAP below 65 mmHg that collectively sum to 15 minutes or more. Note that this measure is not intended to substitute for the clinician’s judgement about managing IOH for any given patient, and for some patients the clinician may manage blood pressure using a higher or lower target MAP (e.g., a higher MAP target for patients with chronic hypertension).

To report the measure, the reporting clinician must submit data on the patient's MAP over the course of the surgery as monitored by an anesthesia information management system (AIMS). The reporting clinician must submit intraoperative patient vitals extracted directly from an interface with the monitor. Reporting clinicians who track blood pressure manually are not eligible to report the measure. If the record for a given case includes both vitals pulled from the monitor and manually recorded vitals, only those from the monitor will be used to score the measure.

The first blood pressure reading is defined as the anesthesia start time. The measure end time is defined as the anesthesia end time. A given blood pressure reading will be attributed to the period that runs from the time the reading was recorded to the time of either the next reading or the measure end time. If the period between a given reading and either the next reading or the measure end time lasts for longer than five minutes, the reading will only be attributed for five minutes. If the reporting clinician monitors a patient using more than one method and there are two MAPs available at the same point in time, the measure uses the invasive value for scoring the measure. The measure attributes the full case to all reporting clinicians who provide care during any portion of the case from the beginning to the end of the measurement period.
The measure excludes patients with a baseline MAP below 65 mmHg. To determine the patient’s baseline MAP, the measure relies on the most recent reading taken from the preoperative holding area. If no such reading is available, the measure uses the most recent MAP taken in the operating room before induction of anesthesia.

If a clinician does not have MAP values available to report either for the baseline MAP or for measurements across the measurement period, the clinician may submit pairs of systolic and diastolic blood pressures (SBPs and DBPs) as a replacement for the MAP. The registry collecting the data will use these systolic and diastolic pressure values to calculate MAP values. Specifically, the registry will calculate MAP using the following formula: $\text{MAP} = \frac{1}{3} (\text{SBP}) + \frac{2}{3} (\text{DBP})$ (Sesso et al. 2000).

Non-emergency surgeries include both elective and urgent surgeries.

Because longitudinal blood pressure data can contain artifactual values (for example, inaccurate readings caused by the surgeon’s leaning on the blood pressure cuff), the measure will drop MAP, SBP, and DBP readings that are likely to be artifacts. Specifically, the measure will drop individual MAP readings that meet any of the following criteria:

Documented as an artifact by the clinician:
- SBP ≥ 300 mmHg or ≤20 mmHg
- DBP ≤5 mmHg or DBP ≥ 225 mmHg
- SBP and DBP within 5 mmHg
- MAP ≤30 mmHg or ≥ 250 mmHg

**Measure Reporting via the Qualified Clinical Data Registry**

CPT codes, patient demographics and billing data are used to identify patients who are included in the measure’s denominator. Denominator eligible cases are required to be sent from an electronic reporting facility to qualify. Registry codes are used to report the numerator. Reporting clinicians who track information manually are not eligible to report the measure.

**Denominator**
- Unadjusted measure score: All cases in which adults (ages 18 and older) with noncardiac, non-emergency surgery requires general, neuraxial, or regional anesthesia care.
- Risk adjusted measure score: The expected number of cases in which patients have a MAP below 65 mmHg that exceeds the cumulative length of 15 minutes with noncardiac, non-emergency surgery requiring general, neuraxial, or regional anesthesia care, based on the risk adjustment model.

**Denominator Criteria (Eligible Cases):**
Patient aged 18 years and older
**AND**
Anesthesia Types: General Anesthesia, Neuraxial Anesthesia, Regional Anesthesia
**AND**
Patient encounter during the reporting period (CPT):
00100, 00103, 00160, 00162, 00164, 00170, 00174, 00176, 00190, 00192, 00210, 00211, 00212, 00214, 00215, 00216, 00218, 00220, 00222, 00300, 00320, 00322, 00350, 00352, 00400, 00402, 00404, 00406, 00450, 00452, 00454, 00470, 00472, 00474, 00500, 00505, 00520, 00524, 00528, 00529, 00530, 00532, 00534, 00539, 00540, 00541, 00542, 00546, 00548, 00550, 00600, 00604, 00620, 00625, 00626, 00630, 00632, 00635, 00640, 00670, 00700, 00702, 00730, 00750, 00752, 00756, 00770,
Denominator Exclusions

- The measure excludes patients with a baseline MAP below 65 mmHg: 99A16
  - To determine the patient’s baseline MAP, the measure relies on the most recent reading taken from the preoperative holding area. If no such reading is available, the measure uses the most recent MAP taken in the operating room before induction of anesthesia.
  - If a clinician does not have MAP values available to report either for the baseline MAP or for measurements across the measurement period, the clinician may submit pairs of systolic and diastolic blood pressures (SBPs and DBPs) as a replacement for the MAP. The registry collecting the data will use these systolic and diastolic pressure values to calculate MAP values. Specifically, the registry will calculate MAP using the following formula: $MAP = \frac{1}{3} (SBP) + \frac{2}{3} (DBP)$

- The measure excludes surgeries where add on code 99135 (Anesthesia complicated by utilization of controlled hypotension) is listed separately in addition to the code for the primary anesthesia procedure): 99135

- ASA Physical Status Classification of 1, 5 and 6

- Emergent case

Numerator

Patients who have a MAP below 65 mmHg that exceeds the cumulative length of 15 minutes with noncardiac, non-emergency surgery requiring general, neuraxial, or regional anesthesia care.

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:

99A17 MAP below 65 mmHg that exceeds the cumulative length of 15 minutes.

OR

Performance Not Met:

99A18* MAP does not fall below 65 mmHg for a cumulative length of 15 minutes

* Denotes codes that will be added for you based on the data submission. This measure requires additional data files submitted in addition to the standard XML format. The file specification is outlined in Appendix A.

---

Data submissions without the additional data files will not qualify for this measure, all data elements in the additional data file format are required.

NQF Number: Not Applicable

eCQM: Not Applicable

Rationale
MAP below 60–70 mmHg among adults having non-cardiac surgery is associated with increased risk of acute kidney injury (AKI), myocardial injury, and mortality, and the risk is a function of both hypotension severity and duration. Noncardiac surgery patients are at increased risk of AKI when their cumulative time below a MAP of 65 mmHg reaches or exceeds 13 minutes. When patients fall even further below this threshold (for example, MAP below 55 mmHg), even shorter durations are associated with increased risk of AKI. Among adult noncardiac surgery patients, 31.3 percent have experienced MAP below 65 mmHg for 10 minutes or longer. Different approaches for managing patients’ blood pressure during surgery are significantly associated with higher or lower risks of postoperative organ dysfunction, including renal dysfunction.

Data Source: Claims, Electronic Health Record (Anesthesia Information Management System, Patient Record)

Measure Steward: ePreop Anesthesia Quality Registry/Cleveland Clinic

Number of Performance Rates: Not applicable

Proportion Measure Scoring: No

Continuous Measure Scoring: No

Risk Adjustment: Yes

Care Setting: Hospital

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Risk Adjustment

Variables incorporated into the risk adjustment model include the following:

- Age
- ASA physical status classification
- Body mass index
- Duration of surgery
- Gender

Steps for Calculating Unadjusted and Risk-Adjusted Measure Scores

The measure is risk-adjusted to account for patient-level and case-level risk factors that affect the probability of IOH that are outside of an anesthesia provider’s control. The risk adjustment model calculates the likelihood that a given case would result in IOH based on patient factors; the risk-adjusted measure then scores a clinician by comparing observed instances of IOH to the expected number of IOH cases for that clinician, given the characteristics of their patient population. Clinicians with more observed cases of IOH than expected would receive a higher (worse) score than those with fewer observed cases of IOH than expected.

1. First, clean the data to be used in calculating the measure scores. Check for missing or implausible values for key variables and drop artefactual blood pressure readings from the longitudinal blood pressure data.
2. Apply the measure logic to all cases occurring during the measurement period to identify all cases meeting the denominator criteria, all cases excluded from the denominator, and all cases meeting the numerator criteria (i.e., cases with IOH).
3. Calculate a clinician-level unadjusted measure score. This score is a percentage, with the numerator defined as all numerator cases associated with the clinician, and the denominator defined as all denominator cases (minus excluded cases) associated with the clinician.
4. Apply the risk adjustment model to calculate the predicted probability that a given case would meet the numerator criteria (i.e., result in IOH). The model use logistic regression to calculate the log-odds that a given case will result in IOH based on patient- and case-level factors. Apply the model to all cases that meet the denominator criteria and that are not excluded from the denominator. Transform the case-level log-odds into case-level predicted probabilities. To do so, exponentiate the log-odds to first transform it to odds. Then transform the odds to probability by taking the odds divided by 1 plus the odds.
5. Calculate a clinician-level expected number of IOH cases. For a given clinician, take the sum of the predicted probabilities for all denominator cases associated with the clinician (minus exclusions). This sum represents the total number of cases for the clinician that are expected to result in IOH, given the risk level
6. Calculate a risk-adjusted score for each clinician. The score is the ratio of the clinician’s total count of cases meeting the numerator criteria to the expected number of IOH cases, among cases that meet denominator criteria for that clinician.

7. (Optional) Transform the risk-adjusted score for each clinician into a percentage. Note that performing this transformation is not necessary to calculate the measure, but individual sites may find that representing the scores as a percentage may be helpful for communicating with providers about their measure score. To do so, multiply each clinician’s risk adjusted score from Step 6 (the observed to expected ratio) by the average unadjusted IOH measure score for the larger unit within which clinicians are being compared, for example, a group practice, hospital department, or national reporting program. This transformation may make the risk-adjusted score more easily interpretable, although it is not a true percentage generated from the ratio of numerator and denominator, and it can result in “percentages” greater than 100%.

**Step 1: Clean the data to be used in measure score calculation**

1. This section described the recommended steps for cleaning the data to be included in the measure score calculation. It identifies checks to run on the data, but in most cases, it does not proscribe a specific approach for cleaning the data, leaving that determination to each individual site.

2. Check for missing values of any of the risk adjustment variables (age, gender, ASA status, BMI, surgery length); the risk adjustment model requires that all covariates are non-missing for each case. Determine how best to address missing values (e.g., impute them, or drop the case if there are few cases with missing values).

3. Check for implausible values for the risk adjustment variables. Determine how best to address them (e.g., correct them if possible, or drop the case if there are few implausible values).

4. Check for implausible values for the timestamp variables. For example, anesthesia start time and induction time should always occur before anesthesia end time. Determine how best to address implausible timelines (e.g., correct them if possible, or drop the case if there are few implausible timelines).

5. Drop artefactual blood pressure readings from longitudinal blood pressure data. See Guidelines section above for details.

**Step 2 Apply measure logic to identify denominator cases, denominator exclusions, and numerator cases**

This section describes the steps used to apply the measure logic to each case included in the measure’s initial population. See specifications above and attached measure flow diagram for more detailed guidance on applying measure logic, including definitions of all key parameters.

1. Run the measure on all anesthesia cases during the measurement period, representing a full calendar year.

2. Apply the initial population criteria to each case (see Initial Population section above for definitions for key parameters), and remove cases from the population if any of the below scenarios applies:
   a. Patient is under 18 years of age
   b. Case is an emergency surgery
   c. Case does not include general anesthesia, neuraxial, or regional anesthesia care

3. Use the cases in the initial population as the denominator cases.

4. Apply denominator exclusion criteria to the denominator cases (see Denominator Exclusions section above for definitions of key parameters), and exclude cases if any of the below scenarios applies:
   a. Case has ASA Physical Status Classification of 1, 5 or 6
   b. Patient has baseline MAP below 65 mmHg

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c. Case includes induced hypotension
5. For each denominator case not excluded from the measure, apply the numerator criteria. Calculate the cumulative duration in which the patient’s MAP was below 65 mmHg from anesthesia start time to anesthesia end. If this duration reaches or exceeds 15 minutes, assign the case to the numerator population. Otherwise, do not assign the case to the numerator population.

**Step 3: Calculate the clinician-level unadjusted measure score**

This section describes the steps for calculating each clinician’s unadjusted score on the IOH measure.

1. For a given clinician, identify all cases the clinician is associated with that are included in the measure denominator.
2. Calculate the clinician’s unadjusted score on the measures using the following equation:

\[
IOH_{\text{Unadjusted}} = \frac{(\text{Sum of numerator cases})}{(\text{Sum of denominator cases}) - (\text{Sum of denominator exclusion cases})}
\]

**Step 4: Apply risk adjustment model to calculate predicted probability of IOH**

1. After calculating the unadjusted score, the next step is to apply the risk adjustment logistic regression model to each denominator case to determine the case’s predicted probability of inclusion in the numerator population (i.e., of IOH occurring) given the case mix. The model includes five risk adjustment variables that may have an association with risk of IOH based on the clinical literature, input from experts during development of the measure, results from measure testing, or a combination of these factors. The risk adjustment variables include the patient’s age, the ASA Physical Status Classification for the case, the patient’s body mass index (BMI), the duration of the surgery, and the patient’s gender. These variables were selected because they are associated with IOH but are outside the control of the clinician. In the model, these categorical variables with k categories are transformed into (k-1) variables with two levels. Apply the risk adjustment model to each case that is part of the denominator population and that has not been excluded.
2. The risk adjustment model is a logistic regression model with the following form:

\[
\text{logit}(IOH) = \beta_0 + \beta_1 \times \text{Age} + \beta_2 \times \text{ASA}_2 + \beta_3 \times \text{ASA}_4 + \beta_4 \times \text{BMI} + \beta_5 \times \text{Surg}_{\text{Length Cat}}_{60-119} + \beta_6 \times \text{Surg}_{\text{Length Cat}}_{120-179} + \beta_7 \times \text{Surg}_{\text{Length Cat}}_{180-239} + \beta_8 \times \text{Surg}_{\text{Length Cat}}_{240-299} + \beta_9 \times \text{Surg}_{\text{Length Cat}}_{300-} + \beta_{10} \times \text{Female}_1
\]

Where:
- \(\beta_0\) = the intercept term of the logistic regression
- \(\beta_1\) = the coefficient for age
- \(\beta_2\) = the coefficient for ASA physical status classification being 2.
- \(\beta_3\) = the coefficient for ASA physical status classification being 4.
- \(\beta_4\) = the coefficient for body mass index (BMI)
BMI = the BMI of the patient at the time of surgery
β5 = the coefficient for the duration of surgery being between 60 and 119 minutes
Surg_Length_Cat_60–119 = a binary variable indicating whether the duration of surgery from anesthesia start time to anesthesia end time was between 60 and 119 minutes, with Surg_Length_Cat_60–119 = 1 for surgeries that met this criteria and Surg_Length_Cat_60–119 = 0 for surgeries that did not meet this criteria.
β6 = the coefficient for the duration of surgery being between 120 and 179 minutes
Surg_Length_Cat_120–179 = a binary variable indicating whether the duration of surgery from anesthesia start time to anesthesia end time was between 120 and 179 minutes, with Surg_Length_Cat_120–179 = 1 for surgeries that met this criteria and Surg_Length_Cat_120–179 = 0 for surgeries that did not meet this criteria.
β7 = the coefficient for the duration of surgery being between 180 and 239 minutes
Surg_Length_Cat_180–239 = a binary variable indicating whether the duration of surgery from anesthesia start time to anesthesia end time was between 180 and 239 minutes, with Surg_Length_Cat_180–239 = 1 for surgeries that met this criteria and Surg_Length_Cat_180–239 = 0 for surgeries that did not meet this criteria.
β8 = the coefficient for the duration of surgery being between 240 and 299 minutes
Surg_Length_Cat_240–299 = a binary variable indicating whether the duration of surgery from anesthesia start time to anesthesia end time was between 240 and 299 minutes, with Surg_Length_Cat_240–299 = 1 for surgeries that met this criteria and Surg_Length_Cat_240–299 = 0 for surgeries that did not meet this criteria.
β9 = the coefficient for the duration of surgery being 300 minutes or longer
Surg_Length_Cat_300+ = a binary variable indicating whether the duration of surgery from anesthesia start time to anesthesia end time was 300 minutes or longer, with Surg_Length_Cat_300+ = 1 for surgeries that met this criteria and Surg_Length_Cat_300+ = 0 for surgeries that did not meet this criteria.
β10 = the coefficient for the gender of the patient
Female_1 = a binary variable indicating the gender of the patient, with Female_1 = 1 for female and 0 for male.

See Table 1 for the values of the constant and the regression coefficients.

Table 1: Parameters for risk adjustment model for the intraoperative hypotension quality measure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>β0: Constant/Intercept</td>
<td>-1.576</td>
</tr>
<tr>
<td>β1: Coefficient 1: Age</td>
<td>-0.008</td>
</tr>
<tr>
<td>β2: Coefficient 2: ASA_2</td>
<td>0.157</td>
</tr>
<tr>
<td>β3: Coefficient 3: ASA_4</td>
<td>0.529</td>
</tr>
<tr>
<td>β4: Coefficient 4: BMI</td>
<td>-0.018</td>
</tr>
<tr>
<td>β5: Coefficient 5: Surg_Length_Cat_60–119</td>
<td>1.316</td>
</tr>
<tr>
<td>β6: Coefficient 6: Surg_Length_Cat_120–179</td>
<td>1.734</td>
</tr>
<tr>
<td>β7: Coefficient 7: Surg_Length_Cat_180–239</td>
<td>1.936</td>
</tr>
<tr>
<td>β8: Coefficient 8: Surg_Length_Cat_240–299</td>
<td>2.235</td>
</tr>
<tr>
<td>β9: Coefficient 9: Surg_Length_Cat_300+</td>
<td>2.879</td>
</tr>
<tr>
<td>β10: Coefficient 10: Female1</td>
<td>0.173</td>
</tr>
</tbody>
</table>

3. The model calculates the log-odds of each case developing IOH, given the risk factors for the given patient and case. Next, transform the case-level log-odds into case-level predicted probabilities. To do so, exponentiate the log-odds to first transform it to odds. Then transform the odds to probability by taking the odds divided by 1 plus the odds. Predicted probabilities can range from 0.00 to 1.00. Values closer to 1.00 represent a higher likelihood that the case would result in IOH. The predicted probability (denoted as
\( IOH_{expected} \) can be presented as:

\[
IOH_{expected} = \frac{e^{\text{logit}(IOH)}}{1 + e^{\text{logit}(IOH)}}
\]

Where, \( \text{logit}(IOH) \) is defined in step 4.2

**Step 5: Calculate the clinician-level expected number of IOH cases**

Next, determine each clinician’s expected number of IOH cases based on the risk-adjustment model by summing the case-level predicted probabilities.

1. For a given clinician, identify all cases the clinician is associated with that are included in the measure denominator and that have not been excluded.
2. Calculate the clinician’s expected number of IOH cases by summing all of the predicted probabilities of IOH for all of the denominator cases.

**Step 6: Calculate the clinician-level risk-adjusted measure score**

After computing an observed and expected number of IOH cases for each clinician, the measure uses those two values as inputs for the risk-adjusted score.

1. For a given clinician, use the observed and expected number of IOH cases to calculate the risk-adjusted score. The observed number of cases is the numerator from the equation in Step 3, and the expected number of cases is the sum calculated in Step 5. Calculate the risk-adjusted score as follows:

\[
IOH_{Adjusted} = \frac{(\text{Sum of numerator cases})}{(\text{Sum of expected IOH cases})}
\]

The resulting score will be a ratio. A score of 1 indicates the clinician had the number of IOH cases we would expect, based on their case mix. Scores less than 1 indicate the clinician had fewer IOH cases than predicted, meaning they are performing better than expected for their case mix. Scores greater than 1 indicate the clinician had more cases of IOH than predicted, meaning they are performing worse than expected given their case mix.

**Step 7 (optional): Transform risk-adjusted measure score into a percentage**

To make the risk-adjusted scores more easily interpretable, the clinician-level ratios calculated in Step 6 can be multiplied by the overall unadjusted performance rate on the measure to transform them into percentages. Note that performing this transformation is not necessary to calculate the measure, but individual sites may find that representing the scores as a percentage may be helpful for communicating with providers about their measure score. To do so, multiply each clinician’s risk adjusted score from Step 6 (the observed to expected ratio) by the average unadjusted IOH measure score for the larger unit within which clinicians are being compared, for example, a group practice, hospital department, or national reporting program. This transformation may make the risk-adjusted score more easily interpretable, although it is not a true percentage generated from the ratio of numerator and denominator, and it can result in “percentages” greater than 100%.

\[
IOH_{Adjusted} = \frac{(\text{Sum of numerator cases})}{(\text{Sum of expected IOH cases})} \times \text{Overall rate}
\]


APPENDIX A

Intraoperative Hypotension (IOH) Data Submission Guide

Documentation contained within this guide is utilized for data submission procedures for the IOH measure. Additional information on the IOH measure can be found on the PorvotionMedical website here: IOH Marketing Material.

Data Exchange

The registry obtains the data via a secure data exchange via SFTP. The file formats are 2 CSV files that are transmitted for patient and vital sign data to meet the IOH measure standards. Field definitions for each of those data extracts are defined further below.

File Naming Standards

- Files are dropped into an IOH Folder on the SFTP
- IOH/PID(XXXX)_PatientDataExtract.csv
- IOH/PID(XXXX)_VitalSignDataExtract.csv

Patient Data Extract

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RecordID</td>
<td>Unique identifier of the case (BillingRecordID with data sent on XML Specifications)</td>
</tr>
<tr>
<td>PatientKey</td>
<td>Unique identifier of the patient</td>
</tr>
<tr>
<td>PrimaryMrn</td>
<td></td>
</tr>
<tr>
<td>FirstName</td>
<td></td>
</tr>
<tr>
<td>LastName</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>DateOfBirth</td>
<td></td>
</tr>
<tr>
<td>AnesthesiaStartDate</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>AnesthesiaEndDate</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>AdmissionDateTime</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>DischargeDateTime</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>ProcedureStartDate</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>ProcedureStartTime</td>
<td>Format = HHMM (24 Hour)</td>
</tr>
<tr>
<td>ProcedureEndDate</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>ProcedureEndDate</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>Field Name</td>
<td>Field Description</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ProcedureEndTime</td>
<td>Format = HHMM (24 Hour)</td>
</tr>
<tr>
<td>ProcedureEndDateTime</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
<tr>
<td>DepartmentKey</td>
<td>Internal Identifier of the department/location</td>
</tr>
<tr>
<td>EncounterVisitIdentifier</td>
<td>Display number within the application for the encounter/visit</td>
</tr>
<tr>
<td>EncounterKey</td>
<td>Internal Identifier of the encounter/visit</td>
</tr>
<tr>
<td>SurgicalService</td>
<td></td>
</tr>
<tr>
<td>AnesthesiaRecordID</td>
<td>Unique identifier of the Anesthesia record</td>
</tr>
<tr>
<td>LocationCode</td>
<td></td>
</tr>
<tr>
<td>LocationName</td>
<td></td>
</tr>
<tr>
<td>LocationKey</td>
<td>Internal Identifier of the location</td>
</tr>
<tr>
<td>ASACode</td>
<td>Valid Values include I, II, III, IV, V, VI, UNKNOWN, IE, IIE, IIIE, IVE, VE, VIE</td>
</tr>
</tbody>
</table>

## Vital Sign Data Extract

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RecordID</td>
<td>Match with value from patient extract. Unique identifier of the case.</td>
</tr>
<tr>
<td>PatientKey</td>
<td>Match with value from patient extract. Unique identifier of the patient</td>
</tr>
<tr>
<td>VitalSignType</td>
<td>Valid Values include MAP, BP, HEIGHT, WEIGHT, BMI</td>
</tr>
<tr>
<td>VitalSignKey</td>
<td>Internal Identifier of the Vital Sign Item</td>
</tr>
<tr>
<td>VitalSignName</td>
<td></td>
</tr>
<tr>
<td>VitalSignDisplayName</td>
<td></td>
</tr>
<tr>
<td>VitalSignValue</td>
<td>If BP, separate systolic and diastolic with a &quot;/&quot;</td>
</tr>
<tr>
<td>VitalSignDate</td>
<td>Format = YYYYMMDD</td>
</tr>
<tr>
<td>VitalSignTime</td>
<td>Format = HHMM (24 Hour)</td>
</tr>
<tr>
<td>UnitOfMeasure</td>
<td></td>
</tr>
<tr>
<td>VitalSignDateTime</td>
<td>Format = YYYY-MM-DD HH:MM:SS (24 Hour)</td>
</tr>
</tbody>
</table>