Qualified Clinical Data Registry (QCDR) Measure Specification File

PATHOLOGY & ANESTHESIA

Reporting Year: 2026

TABLE OF CONTENTS

Quality Measure	Page
QMM21 – Incorporating Results of Concurrent Studies into Final Reports for Bone Marrow Aspirate of Patients with Leukemia, Myelodysplatsic Syndrome, or Chronic Anemia	4
QMM25 – Use of Structured Reporting for Urine Cytology Specimens	10
QMM29 – Use of Appropriate Classification System for Lymphoma Specimen	14
QMM30 – Appropriate Use of Bethesda System for Reporting Thyroid Cytopathology on Fine Needle Aspirations (FNA) of Thyroid Nodule(s)	19
QMM33 – Immunohistochemistry (IHC) and/or Molecular BRAF Testing Status in Metastatic Melanoma	24
QMM34 – Use of Appropriate Scoring System for Immunohistochemistry (IHC) for HER2/neu Testing for Invasive Breast Cancer	29
QMM35 – P16 Immunohistochemistry (IHC) Staining Status in Oropharyngeal Squamous Cell Carcinoma (OPSCC)	34
QMM36 – P53 Immunohistochemistry (IHC) Staining Status in Endometrial Carcinoma	38
ABG44 – Low Flow Inhalational General Anesthesia	42
AQI18 – Coronary Artery Bypass Graft (CABG): Prolonged Intubation – Inverse Measure	47
AQI48 – Patient-Reported Experience with Anesthesia	50
AQI65 – Avoidance of Cerebral Hyperthermia for Procedures Involving Cardiopulmonary Bypass	57
AQI71 – Ambulatory Glucose Management	60

Quality Measure	Page
AQI81 – Use of Peripheral Nerve Blocks for Pain Management in Hip Fracture Patients	75
AQI82 – Intraoperative Antibiotic Redosing in Open Cardiac Surgery Cases	79
Epreop31 – Intraoperative Hypotension among Non-Emergent Noncardiac Surgical Cases	85

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM21: Incorporating Results of Concurrent Studies into Final Reports for Bone Marrow Aspirate of Patients with Leukemia, Myelodysplastic Syndrome, or Chronic Anemia

- **National Quality Strategy Domain: Communication and Care Coordination**
- **Meaningful Measure Area: Promote Effective Communication and Coordination of Care**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final Bone Marrow Aspirate reports for patients with Leukemia, Myelodysplastic Syndrome, or Chronic Anemia with documentation of concurrent studies performed, their respective results, and interpretation of those results.

INSTRUCTIONS:
This measure is to be submitted **each time** a biopsy report is completed on bone marrow aspirate for patients diagnosed with Leukemia, Myelodysplastic Syndrome, or Chronic Anemia during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final reports for Bone Marrow Aspirate for patients with a diagnosis of Leukemia, Myelodysplastic Syndrome, or Chronic Anemia.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 85097
AND
Diagnosis of Leukemia, Myelodysplastic Syndrome, or Chronic Anemia (ICD-10-CM):
Leukemia: C91.00, C91.01, C91.02, C91.10, C91.11, C91.12, C91.30, C91.31, C91.32, C91.40, C91.41, C91.42, C91.50, C91.51, C91.52, C91.60, C91.61, C91.62, C91.A0, C91.A1, C91.A2, C91.20, C91.21, C91.22, C91.90, C91.91, C91.92, C92.00, C92.01, C92.02, C92.10, C92.11, C92.12, C92.20, C92.21, C92.22, C92.30, C92.31, C92.32, C92.40, C92.41, C92.42, C92.50, C92.51, C92.52, C92.60, C92.61, C92.62, C92.A0, C92.A1, C92.A2, C92.Z0, C92.Z1, C92.Z2, C92.90, C92.91, C92.92, C93.00, C93.01, C93.02, C93.10, C93.11, C93.12, C93.30,

C93.31, C93.32, C93.Z0, C93.Z1, C93.Z2, C93.90, C93.91, C93.92, C94.00, C94.01, C94.02, C94.20, C94.21, C94.22, C94.20, C94.31, C94.32, C94.40, C94.41, C94.42, C94.6, C94.80, C94.81, C94.82, C95.00, C95.01, C95.02, C95.10, C95.11, C95.12, C95.90, C95.91, C95.92
Myelodysplastic Syndrome: D46.0, D46.1, D46.20, D46.21, D46.22, D46.A, D46.B, D46.2C, D46.4, D46.Z, D46.9
Chronic Anemia: D50.0, D50.1, D50.8, D50.9

Denominator Exclusion(s): None

NUMERATOR:
Final reports that include mention of all concurrent studies performed, their results, and interpretation of those results as it relates to the patient's diagnosis*.
Concurrent studies must include:

1. Peripheral Blood Smear (aka, Manual Differential),
2. Flow Cytometry, AND
3. Cytogenetic Analysis

***Numerator Note:** Documentation must include results for ALL concurrent studies, if performed, (smear, flow, and cytogenetics) within the body of the report to the referring provider, including findings from send outs. If results to any of the concurrent studies are received after the initial pathology report is sent out (i.e., an addendum is made), the addended report MUST include a statement indicating whether the original patient diagnosis changed, or remains unchanged, after review of these latest concurrent study results. **If the diagnosis is changed, this change should be directly communicated** to the ordering provider**, with this communication documented. **If a concurrent study was not performed, documentation must state that it was not performed to pass the measure.**

Definition:
****Direct Communication:** A form of communication that is in addition to, and more immediate than, the documentation in the Final Ultrasound Report. This could include: a phone call, entry into a critical-results reporting system, or other means.

Numerator Options:
Performance Met:
PM021: Final pathology report includes results for all concurrent studies, including Peripheral Blood Smear, Flow Cytometry, and Cytogenetic Analysis, AND in cases where results are received after the initial pathology report is completed, addended final pathology report includes reference as to whether the original diagnosis CHANGED or REMAINS UNCHANGED based on the concurrent test results. In cases where diagnosis is changed, **direct communication**** must be made to the ordering provider, with documentation of this communication in the patient's medical record.

OR

Performance Not Met:
PNM21: Final pathology report does not include results for all concurrent studies, including Peripheral Blood Smear, Flow Cytometry, and Cytogenetic Analysis, AND/OR in cases where

results are received after the initial pathology report is completed, addended final pathology report does not include reference as to whether the original diagnosis CHANGED or REMAINS UNCHANGED based on the concurrent test results, AND/OR if diagnosis is changed, there is no record of **direct communication**** to ordering provider.

OR

Denominator Exception:
PE021: Documentation of medical reason(s) for not reporting results of all concurrent studies performed (Peripheral Blood Smear, Flow Cytometry, and Cytogenetic Analysis).

RATIONALE:
This measure address two important factors to improve quality of care:

1. Ensuring documentation of, and incorporation into, the final diagnosis of all ancillary tests performed with a bone marrow biopsy is an essential part of providing the treating physicians with a comprehensive review of the patient's condition. Often times, the treating providers only have part of the picture, because not all of the results from ancillary tests are incorporated into the final bone marrow report. Three of these ancillary tests that are very useful for bone marrow biopsy complete diagnosis are peripheral blood smear evaluation, flow cytometry studies, and cytogenetic karyotype.
2. Improving continuity of care by placing the results to all applicable studies in one report for the treating provider to review. Often times the treating provider receives results from various sources (pathologists, reference labs, cytogeneticist, etc.) and must track down results and compile themselves when evaluating the patient's condition. By having the results in a central location this saves the treating provider time and increases the likelihood they have all the tools at their disposal to make the best possible clinical decisions.

CLINICAL RECOMMENDATION STATEMENT(S):
Flow Cytometry, and Cytogenetic Analysis are tests easily performed from the existing Bone Marrow Aspirate sample. Peripheral Blood Smears are also easily obtained at the time of the procedure. All three tests are valuable for diagnosis and determining the most appropriate treatment plan for a patient, from the initial stages of treatment planning to post treatment monitoring of a cancer patient.

American Society of Hematology (ASH)
Diagnosis and classification of myelodysplastic syndromes (MDS)

- Peripheral Blood Smear: A full differential count of at least 200 nucleated peripheral blood leukocytes must be performed to quantify the proportion of blasts as well as monocytes.
- Flow Cytometry: Flow cytometric methods can be useful to quantify the proportion of CD34+ and CD117+ myeloid progenitors, which usually correlate with the blast percentage obtained by visually counting the bone marrow aspirate smear. However, the blast percentage by flow cytometry is influenced by preanalytic variables and in situations of discrepancy, the manual blast count from the aspirate smear should be used, provided it is an adequate specimen. Flow cytometry also reliably identifies aberrant features in blast and nonblast cells that can help support a diagnosis of MDS. The European Leukemia Net/International MDS Flow Cytometry Working Group recently put forth recommendations for the application of flow

cytometry to diagnose MDS. According to these guidelines, a putative diagnosis of MDS can be supported with varying levels of certainty, depending on the score. Finally, flow cytometry of bone can reveal clonal B-cell populations or abnormal T-cell populations that suggest alternative diagnoses, such as hairy cell leukemia or large granular lymphocytic leukemia, which may be subtle and missed on initial morphologic review.

- Cytogenetics: Karyotyping remains the most widely used and unbiased method for assessing numerical and structural chromosomal abnormalities, which are observed in 50% to 60% of patients with MDS. Karyotype of bone marrow aspirate should be performed in all patients with suspected MDS undergoing bone marrow examination. At least 20 metaphases should be analyzed whenever possible and described according to the International System for Human Cytogenetic Nomenclature recommendations [1].

Atlas of Hematology and Analysis of Peripheral Blood Smears
The examination of a peripheral blood smear is one of the most informative exercises a physician can perform [2].

Yale Medicine
Diagnosing leukemia in its earliest stages can improve a patient's prognosis, so it is important to be tested as soon as possible if leukemia is suspected. In this age of precision medicine, advancements in molecular cytogenetics have enabled doctors to determine the best treatment for the patient [3].

Bone marrow evaulation for diagnosis and monitoring of acute myeloid leukemia (Blood Reviews)
The diagnosis of acute myeloid leukemia (AML) can be made based on peripheral blood or bone marrow blasts. For patients with circulating blasts, it is reasonable to perform the necessary studies needed for diagnosis and risk stratification, including multiparametric flow cytometry, cytogenetics, and molecular analysis, on a peripheral blood specimen [4].

Flow Cytometry: Principles and Clinical Applications in Hematology (Clinical Chemistry)
Flow cytometry is a powerful technique for correlating multiple characteristics on single cells. This qualitative and quantitative technique has made the transition from a research tool to standard clinical testing [5].

MEASURE TESTING AND GAP ANALYSIS:
A sample of 1,345 Bone Marrow Biopsy pathology reports for patients diagnosed with a diagnosis of Leukemia, Myelodysplastic Syndrome, or Chronic Anemia across a six-month period, encompassing ten pathology practices and 43 providers were reviewed.

Results showed only 69% of the 1,345 reports reviewed cited that all three concurrent studies were performed. Only 46.7% of the overall reports reviewed actually provided the results for all three concurrent studies.

In our review, this measure was found to be applicable to 85% of MSN QCDR Pathology Clients; with the lowest annual eligible encounters per TIN at 35 and the highest at 234, with an average eligible count per group of 108 per year.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

References:

1. Hasserjian RP, Germing U, Malcovati L. Diagnosis and classification of myelodysplastic syndromes. Blood. 2023 Dec 28;142(26):2247-57. doi: https://doi.org/10.1182/blood.2023020078.
2. Longo DL. Atlas of hematology and analysis of peripheral blood smears. The McGraw-Hill Companies, Inc. 2012;e17:1-12. https://www.mhprofessionalresources.com/mediacenter/hpim18/assets/pdf/Harr18_e17.pdf.
3. Cytogenic studies for leukemia diagnosis. Yale Medicine. 2021. https://www.yalemedicine.org/conditions/cytogenic-studies-leukemia-diagnosis.
4. Percival ME, Lai C, Estey E, Hourigan CS. Bone marrow evaluation for diagnosis and monitoring of acute myeloid leukemia. Blood Review. 2017 Jul;31(4):185-192. doi: https://doi.org/10.1016/j.blre.2017.01.003.
5. Brown M, Wittwer C. Flow cytometry: principles and clinical applications in hematology. Clinical chemistry. 2000 Aug 1;46(8):1221-9. doi: https://doi.org/10.1093/clinchem/46.8.1221.
6. https://www.lls.org/managing-your-cancer/lab-and-imaging-tests/blood-tests

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Promote Effective Communication and Coordination of Care
NQS Domain: Communication and Care Coordination
Measure Type: Process
Data Source: Paper medical record; Record review; Claims; Hybrid
Care Setting(s): Ambulatory; Ambulatory Care: Hospital; Ambulatory Care: Urgent Care; Hospital; Hospital Inpatient; Hospital Outpatient; Emergency Department and Services; Outpatient Services
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS; MVP
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =

$$\frac{\text{Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures)}}{\text{Eligible Population / Denominator (c=100 procedures)}} = \frac{\text{100 procedures}}{\text{= 100 procedures}} = \textbf{100.00\%}$$

Performance Rate =

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures)}} = \frac{\text{40 procedures}}{\text{= 80 procedures}} = \textbf{50.00\%}$$

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM25: Use of Structured Reporting for Urine Cytology Specimens
- **National Quality Strategy Domain: Patient Safety**
- **Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
The percentage of Final Reports on Urine cytology specimens, for patients of any age, that utilize The Paris System (TPS) for reporting urinary cytology.

INSTRUCTIONS:
This measure is to be submitted **each time** a pathology report is completed on Urine cytology specimens for all patients during the performance period. There is no diagnosis associated with this measure.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final pathology reports for urine cytology specimens.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88108, 88112
AND
Urine cytology specimen **(EE025)**

Denominator Exclusion(s): None

NUMERATOR:
Final pathology reports for urine cytology specimens with documented use of The Paris System for reporting urinary cytology, including assignment to a TPS Diagnostic Category*.

***Numerator Note:** Documentation must include assignment to one of the following TPS 2.0 (2022) Diagnostic Categories [6]:*

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

1. *Non-diagnostic (ND)*
2. *Negative for high-grade urothelial carcinoma (NHGUC; includes LGUN)*
3. *Atypical urothelial cells (AUC)*
4. *Suspicious for high-grade urothelial carcinoma (SHGUC)*
5. *High-grade urothelial carcinoma (HGUC)*
6. *Other: primary and secondary malignancies (OM)*

Numerator Options:

Performance Met:

PM025: Final pathology report includes documented use of The Paris System for reporting urinary cytology, including assignment to a TPS Diagnostic Category.

OR

Performance Not Met:

PNM25: Final pathology report does not include documented use of The Paris System for reporting urinary cytology, including assignment to a TPS Diagnostic Category.

OR

Denominator Exception:

PE025: Documentation of medical reason(s) for not including documented use of The Paris System for reporting urinary cytology (e.g., quality of the urine sample is poor or inadequate to achieve an accurate classification).

RATIONALE:

Bladder cancer is the 10th most common form of cancer world-wide, with an estimated 573,000 cases in 2020 [2]. High-Grade urothelial carcinoma (HGUC) is at the highest risk for disease progression and metastases, followed by death [4]. Urine cytology is an important screening tool of patients for urothelial carcinoma (UC) and follow-up of patients with treated disease, with the ultimate goal of urinary cytology being the identification of HGUC [1].

The Paris System (TPS) for reporting urinary cytology is an established international system for diagnosing urinary tract cytology specimens (TPS 1.0, published in 2016). TPS 1.0 was developed to accurately and clearly communicate cytological findings, and to provide a clear diagnostic, therapeutic and clinically relevant management path for clinicians based on these findings [1]. After six years, TPS 2.0 was published in 2022 upon the acquisition of new data. TPS 2.0 clarifies the diagnostic categories, updates the risk of malignancy in each category, reflects developments of molecular tests, and extends TPS recommendations to the upper urinary tract (UUT) [6,7].

TPS differs from the conventional systems for reporting urine cytology since it focuses on the diagnosis of high-grade urothelial carcinoma (HGUC), and has proven to result in more accurate diagnosis of High-Grade urothelial cancer (HGUC) (fewer false positive and negative diagnoses) [4].

About one fifth of apparent false negative diagnoses for HGUC can be because of overdiagnosis of HGUC by surgical pathologists [3]. Under the conventional system, many patients receive an “atypical” urine cytology diagnosis, then have invasive procedures such as cystoscopy, FISH testing, imaging, or more laboratory testing that wind up not being necessary. With TPS, a provider can rule out most

"atypical" diagnosis as negative for high grade urothelial carcinoma (HGUC) instead, saving the patient the unnecessary, costly tests/procedures and worry.

CLINICAL RECOMMENDATION STATEMENT(S):

American Journal of Clinical Pathology (AJCP):

A Single Institutional Experience With the Paris System for Reporting Urinary Cytology

TPS increases the rate of detection of HGUC and reduces the rate of reporting "atypical" urothelial cells. TPS also standardizes the diagnostic criteria, thereby bringing uniformity and reproducibility into the system of reporting for urine cytology [5].

MEASURE TESTING AND GAP ANALYSIS:

In our review, this measure was found to be applicable to 100% of MSN QCDR Pathology Clients; with the lowest annual eligible encounters per TIN at 26 and the highest at 3,264, with an average eligible count per group of 1,281 per year.

A survey of nine pathology practices across six states, including 7,207 final pathology reports for urine cytology specimens performed in 2021, showed that only three of the practices (33%) reported at least one instance of TPS documentation being included on final pathology reports for urine cytology specimens in 2021. A further review of the reports for only those practices using TPS, showed an inconsistent use of the tool, with only 76.8% of their reports providing an assignment to a TPS category.

References:

1. Pansare V, Parakh R. Paris system for urothelial neoplasia. PathologyOutlines.com. 2020 Sep. https://www.pathologyoutlines.com/topic/bladdercytologyparissystemnew.html
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021 May;71(3):209-249. doi: https://doi.org/10.3322/caac.21660.
3. Lee PJ, Owens CL, Lithgow MY, Jiang Z, Fischer AH. Causes of false-negative for high-grade urothelial carcinoma in urine cytology. Diagn Cytopathol. 2016 Dec;44(12):994-999. doi: https://doi.org/10.1002/dc.23621
4. Yamasaki M, Taoka R, Katakura K, Matsunaga T, Kani N, Honda T, Harada S, Tohi Y, Matsuoka Y, Kato T, Okazoe H, Tsunemori H, Ueda N, Haba R, Sugimoto M. The Paris System for reporting urinary cytology improves the negative predictive value of high-grade urothelial carcinoma. BMC Urol. 2022 Apr 5;22(1):51. doi: https://doi.org/10.1186/s12894-022-01005-8.
5. Zare S, Mirsadraei L, Reisian N, Liao X, Roma A, Shabaik A, Hasteh F. A Single Institutional Experience With the Paris System for Reporting Urinary Cytology: Correlation of Cytology and Histology in 194 Cases. Am J Clin Pathol. 2018 Jul 3;150(2):162-167. doi: https://doi.org/10.1093/ajcp/aqy043.

6. Chen F, Lin X. The Paris System for reporting urinary cytology: an updated review. Journal of Clinical and Translational Pathology. 2023 Jun 25;3(2):59-74. doi: https://doi.org/10.14218/JCTP.2022.00035.
7. Miyai K, Nakayama M, Minabe S, Ogata S, Ito K, Matsukuma S. Implementation of The Paris System for Reporting Urine Cytology improves diagnostic accuracy of selective upper urinary tract cytology. Cancer Cytopathology. 2024 Apr;132(4):242-9. doi: https://doi.org/10.1002/cncy.22792.

Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease
NQS Domain: Patient Safety
Measure Type: Process
Data Source: Paper medical record; Record review; Hybrid
Care Setting(s): All Settings
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS; MVP
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =

$$\frac{\text{Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures)}}{\text{Eligible Population / Denominator (c=100 procedures)}} = \frac{100 \text{ procedures}}{= 100 \text{ procedures}} = \mathbf{100.00\%}$$

Performance Rate =

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures)}} = \frac{40 \text{ procedures}}{= 80 \text{ procedures}} = \mathbf{50.00\%}$$

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM29: Use of Appropriate Classification System for Lymphoma Specimen
- **National Quality Strategy Domain: Patient Safety**
- **Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final lymphoma specimen pathology reports, regardless of patient age, that classify the lymphoma using a validated and published model for lymphoma classification*.

**Must be one of the models listed in the Numerator Instructions below.*

INSTRUCTIONS:
This measure is to be submitted **each time** a final lymphoma specimen pathology report is completed for all patients during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final lymphoma specimen pathology reports.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88305, 88307, 88309
AND
Diagnosis of lymphoma (ICD-10-CM): C81.00, C81.02, C81.03, C81.04, C81.05, C81.06, C81.07, C81.08, C81.09, C81.10, C81.11, C81.12, C81.13, C81.14, C81.15, C81.16, C81.17, C81.18, C81.19, C81.70, C81.71, C81.72, C81.73, C81.74, C81.75, C81.76, C81.77, C81.78, C81.79, C81.90, C81.91, C81.92, C81.93, C81.94, C81.95, C81.96, C81.97, C81.98, C81.99, C82.00, C82.01, C82.02, C82.03, C82.04, C82.05, C82.06, C82.07, C82.08, C82.09, C82.10, C82.11, C82.12, C82.13, C82.14, C82.15, C82.16, C82.17, C82.18, C82.19, C82.20, C82.21, C82.22, C82.23, C82.24, C82.25, C82.26, C82.27, C82.28, C82.29, C82.30, C82.31, C82.32, C82.33, C82.34, C82.35, C82.36, C82.37, C82.38, C82.39, C82.40, C82.41, C82.42, C82.43, C82.44, C82.45, C82.46, C82.47, C82.48, C82.49, C82.50, C82.51, C82.52, C82.53, C82.54,

C82.55, C82.56, C82.57, C82.58, C82.59, C82.60, C82.61, C82.62, C82.63, C82.64, C82.65, C82.66, C82.67, C82.68, C82.69, C82.80, C82.81, C82.82, C82.83, C82.84, C82.85, C82.86, C82.87, C82.88, C82.89, C82.90, C82.91, C82.92, C82.93, C82.94, C82.95, C82.96, C82.97, C82.98, C82.99, C83.00, C83.01, C83.02, C83.03, C83.04, C83.05, C83.06, C83.07, C83.08, C83.09, C83.10, C83.11, C83.12, C83.13, C83.14, C83.15, C83.16, C83.17, C83.18, C83.19, C83.30, C83.31, C83.32, C83.33, C83.34, C83.35, C83.36, C83.37, C83.38, C83.39, C83.50, C83.51, C83.52, C83.53, C83.54, C83.55, C83.56, C83.57, C83.58, C83.59, C83.70, C83.71, C83.72, C83.73, C83.74, C83.75, C83.76, C83.77, C83.78, C83.79, C83.80, C83.81, C83.82, C83.83, C83.84, C83.85, C83.86, C83.87, C83.88, C83.89, C84.00, C84.01, C84.02, C84.03, C84.04, C84.05, C84.06, C84.07, C84.08, C84.09, C84.40, C84.41, C84.42, C84.43, C84.44, C84.45, C84.46, C84.47, C84.48, C84.49, C84.60, C84.61, C84.62, C84.63, C84.64, C84.65, C84.66, C84.67, C84.68, C84.69, C84.70, C84.71, C84.72, C84.73, C84.74, C84.75, C84.76, C84.77, C84.78, C84.79, C84.A0, C84.A1, C84.A2, C84.A3, C84.A4, C84.A5, C84.A6, C84.A7, C84.A8, C84.A9, C84.Z0, C84.Z1, C84.Z2, C84.Z3, C84.Z3, C84.Z4, C84.Z5, C84.Z6, C84.Z7, C84.Z8, C84.Z9, C84.90, C84.91, C84.92, C84.93, C84.94, C84.95, C84.96, C84.97, C84.98, C84.99, C85.10, C85.11, C85.12, C85.13, C85.14, C85.15, C85.16, C85.17, C85.18, C85.19, C85.20, C85.21, C85.22, C85.23, C85.24, C85.25, C85.26, C85.27, C85.28, C85.29, C85.80, C85.81, C85.82, C85.83, C85.84, C85.85, C85.86, C85.87, C85.88, C85.89, C85.90, C85.91, C85.92, C85.93, C85.94, C85.95, C85.96, C85.97, C85.98, C85.99, C86.6, C88.0, C88.2, C88.3, C88.4, C91.50, C91.51, C91.52, C81.0A, C81.1A, C81.2A, C81.3A, C81.4A, C81.7A, C81.9A, C82.0A, C82.1A, C82.2A, C82.3A, C82.4A, C82.5A, C82.6A, C82.8A, C82.9A, C83.0A, C83.1A, C83.390, C83.398, C83.3A, C83.5A, C83.7A, C83.8A, C83.9A, C84.0A, C84.1A, C84.4A, C84.6A, C84.7B, C84.9A, C84.AA, C84.ZA, C85.1A, C85.2A, C85.8A, C85.9A, C86.00, C86.01, C86.10, C86.11, C86.20, C86.21, C86.30, C86.31, C86.40, C86.41, C86.50, C86.51, C86.60

Denominator Exclusion(s): Persistent, recurrent, relapsed, or otherwise previously diagnosed Lymphoma with no changes from initial classification **(DE029)**

NUMERATOR:
Final pathology reports for lymphoma specimen that document use of a validated and published model for lymphoma classification* from the list below, including classification, description, and/or clinical diagnosis of the lymphoma specimen.

Numerator Note:
Validated and Published Models – All eligible reports must include lymphoma classification based on one of the following validated and published models:

- *ICC (International Consensus) 2022 or later [3], or*
- *WHO Classification of Haematolymphoid Tumours, 5th edition or later [1]*

Numerator Options:
Performance Met:
PM029: Final pathology report includes classification of lymphoma specimen based on one of the validated and published models listed in the numerator note above (must cite source).

OR

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Performance Not Met:
PNM29: Final pathology report does not include classification of lymphoma specimen based on one of the validated and published models listed in the numerator note above AND/OR source not cited.

OR

Denominator Exception:
PE029: Documentation of medical reason(s) for not classifying the lymphoma specimen based on one of the validated and published models listed in the numerator note above (e.g., limited sample quality that prohibits accurate classification or unusual and unique cellular detail that requires additional analysis before proper classification can be determined).

RATIONALE:

The use of recent and relevant models for the classification of lymphoma ensures the pathology results are accurately and effectively interpreted. When standardized terminology fails to be used, or the classification tool being used to define the classification terminology is not identified in the report, the door is opened to misinterpretation and poor medical care. Use of such standardized classification of disease models also facilitates the discovery of the molecular basis of lymphoid neoplasms in the basic science laboratory, and leads to new diagnostic tools that play a role in clinical diagnosis. [5]

The WHO classification of tumors of various organ systems, has provided a unified tumor classification system enabling people across the world to share their knowledge and research results. The 5th edition of the WHO classification of hematolymphoid tumors, released in 2022, is the latest edition. It has been completely rewritten with numerous changes and updates, which include revised hierarchical classification structure, addition or deletion of entities or subtypes, changes or revisions of terminology or nomenclature, revisions or changes of diagnostic criteria, and updates of pathogenesis, clinical and genetic features [2].

The International Consensus Classification (ICC) of mature lymphoid, histiocytic, and dendritic cell tumors, proposed in 2022, followed the same process that was successfully used for the third and fourth editions of the World Health Organization Classification of Hematologic Neoplasms. The definition, recommended studies, and criteria for the diagnosis of many entities were extensively refined; some categories considered provisional were upgraded to definite entities; and terminology for some diseases was revised to adapt nomenclature to the current knowledge of their biology, but restricted to well-justified situations. Major findings from recent genomic studies impacted the conceptual framework and diagnostic criteria for many disease entities. These changes will have an impact on optimal clinical management [3].

MEASURE TESTING AND GAP ANALYSIS:

A sample of 891 pathology reports for patients with a diagnosis of lymphoma across a six-month period, encompassing 14 pathology practices and 60 providers were reviewed.

Results showed only 25% of the 891 reports reviewed included classification of the lymphoma specimen based on a validated and published model.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

In our review, this measure was found to be applicable to 94% of MSN QCDR Pathology Clients; with the lowest annual eligible encounters per TIN at 28 and the highest at 788, with an average eligible count per group of 143 per year.

References:

1. Khoury JD, Solary E, Abla O, Akkari Y, Alaggio R, Apperley JF, Bejar R, Berti E, Busque L, Chan JK, Chen W. The 5th edition of the World Health Organization classification of haematolymphoid tumours: myeloid and histiocytic/dendritic neoplasms. Leukemia. 2022 Jul;36(7):1703-19. doi: https://doi.org/10.1038/s41375-022-01613-1.
2. Li W. The 5th Edition of the World Health Organization Classification of Hematolymphoid Tumors. Exon Publications. 2022 Oct 16:1-21. doi: https://doi.org/10.36255/exon-publications-leukemia-who-5th-edition-hematolymphoid-tumors.
3. Campo E, Jaffe ES, Cook JR, Quintanilla-Martinez L, Swerdlow SH, Anderson KC, Brousset P, Cerroni L, de Leval L, Dirnhofer S, Dogan A. The international consensus classification of mature lymphoid neoplasms: a report from the clinical advisory committee. Blood, The Journal of the American Society of Hematology. 2022 Sep 15;140(11):1229-53. doi: https://doi.org/10.1182/blood.2022015851.
4. Falini B, Martino G, Lazzi S. A comparison of the International Consensus and 5th World Health Organization classifications of mature B-cell lymphomas. Leukemia. 2023 Jan;37(1):18-34. doi: https://doi.org/10.1038/s41375-022-01764-1.
5. Jaffe ES. Diagnosis and classification of lymphoma: Impact of technical advances. Semin Hematol. 2019 Jan;56(1):30-36. doi: https://doi.org/10.1053/j.seminhematol.2018.05.007.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease
NQS Domain: Patient Safety
Measure Type: Process
Data Source: Paper medical record; Record review; Hybrid
Care Setting(s): All Settings
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS; MVP
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =

$$\frac{\text{Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures)}}{\text{Eligible Population / Denominator (c=100 procedures)}} = \frac{\text{100 procedures}}{\text{= 100 procedures}} = \textbf{100.00\%}$$

Performance Rate =

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures)}} = \frac{\text{40 procedures}}{\text{= 80 procedures}} = \textbf{50.00\%}$$

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM30: Appropriate Use of Bethesda System for Reporting Thyroid Cytopathology on Fine Needle Aspirations (FNA) of Thyroid Nodule(s)

- **National Quality Strategy Domain: Communication and Care Coordination**
- **Meaningful Measure Area: Appropriate Use of Healthcare**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final pathology reports for thyroid nodule fine needle aspiration (FNA) specimens that include documentation of the diagnostic category, range of estimated risk of malignancy (ROM), and clinical management option(s) in accordance with the Bethesda System for Reporting Cytopathology, 3rd edition (2023) or later, and for thyroid nodule specimens of indeterminate cytology (Bethesda 3 or 4), documentation that direct communication was sent to patient and/or treating physician (if known) to inform them that molecular panel testing may be appropriate.

INSTRUCTIONS:
This measure is to be submitted **each time** a pathology report is completed on a thyroid nodule fine needle aspiration (FNA) specimen for all patients during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final pathology reports for thyroid nodule FNAs.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88173
AND
Thyroid nodule (ICD-10-CM): E04.0, E04.1, E04.2, E04.8, E04.9, E05.10, E05.11, E05.20, E05.21

Denominator Exclusion(s): None

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

NUMERATOR:
Final pathology reports for thyroid nodule FNAs that include ALL of the following in accordance with the Bethesda System for Reporting Cytopathology, 3rd edition (2023) or later:

1. Diagnostic category,
2. Range of estimated risk of malignancy (ROM),
3. Clinical management option(s), AND
4. For thyroid nodule specimens of indeterminate cytology (Bethesda 3 or 4), documentation that **direct communication**** was sent to patient and/or treating physician (if known) to inform them that molecular panel testing may be appropriate

Definition:
****Direct Communication:** A form of communication that is in addition to, and more immediate than, the documentation in the Final Ultrasound Report. This could include: a phone call, entry into a critical-results reporting system, or other means.

Numerator Options:
Performance Met:
PM030: Final pathology report includes ALL of the following in accordance with the Bethesda System for Reporting Cytopathology, 3rd edition (2023) or later:

1. Diagnostic category,
2. Range of estimated risk of malignancy (ROM),
3. Clinical management option(s), AND
4. For thyroid nodule specimens of indeterminate cytology (Bethesda 3 or 4), documentation that **direct communication**** was sent to patient and/or treating physician (if known) to inform them that molecular panel testing may be appropriate

OR

Performance Not Met:
PNM30: Final pathology report does not include ALL of the following in accordance with the Bethesda System for Reporting Cytopathology, 3rd edition (2023) or later:

1. Diagnostic category,
2. Range of estimated risk of malignancy (ROM),
3. Clinical management option(s), AND
4. For thyroid nodule specimens of indeterminate cytology (Bethesda 3 or 4), documentation that **direct communication**** was sent to patient and/or treating physician (if known) to inform them that molecular panel testing may be appropriate

OR

Denominator Exception:
PE030: Documentation of clinical reason(s) why final pathology report does not include documentation of ALL of the requirements listed above.

RATIONALE:
The Bethesda System for Reporting Thyroid Cytopathology gives cytopathologists a standardized, category-based reporting system for thyroid fine needle aspiration (FNA). The third edition builds on the success of the two earlier editions and offers several key updates. The most important is the

assignment of a single name for each of the 6 diagnostic categories: (I) nondiagnostic; (II) benign; (III) atypia of undetermined significance; (IV) follicular neoplasm; (V) suspicious for malignancy; and (VI) malignant. Each of the categories has an implied risk of malignancy (ROM), which has been updated and refined based on data reported after the second edition. The third edition offers an average ROM for each category, in addition to the expected range of cancer risk. The atypia of undetermined significance subcategorization is simplified into 2 subgroups based on the implied ROM and molecular profiling (see **Table 1** [5]). A discussion of pediatric thyroid disease has been added, and pediatric ROMs and management algorithms are discussed in the relevant sections (see **Table 2** [5]). Nomenclature has been updated to align with the 2022 World Health Organization Classification of Thyroid Neoplasms. Two new chapters have been added: one that addresses the significant and expanded use of molecular and ancillary testing in thyroid cytopathology, and another that summarizes clinical perspectives and imaging findings in thyroid disease [4].

Table 1. 2023 Bethesda System for reporting Thyroid Cytopathology: Adults

Diagnostic Category		Risk of Malignancy Mean (Range)	Usual Clinical Management
1	Nondiagnostic	13% (5-20%)	Repeat fine-needle aspiration with ultrasound guidance
2	Benign	4% (2-7%)	Clinical and ultrasound follow-up
3	Atypia of undetermined significance	22% (13-30%)	Repeat fine-needle aspiration, molecular testing, diagnostic lobectomy, or surveillance
4	Follicular neoplasm	30% (23-34%)	Molecular testing, lobectomy, or near total lobectomy
5	Suspicious for malignancy	74% (67-83%)	Molecular testing, lobectomy, or near total lobectomy
6	Malignant	97% (97-100%)	Lobectomy or near total lobectomy

Table 2. 2023 Bethesda System for reporting Thyroid Cytopathology: Pediatrics

Diagnostic Category		Risk of Malignancy Mean (Range)	Usual Clinical Management
1	Nondiagnostic	14% (0-33%)	Repeat fine-needle aspiration with ultrasound guidance
2	Benign	6% (0-27%)	Clinical and ultrasound follow-up
3	Atypia of undetermined significance	28% (11-54%)	Repeat fine-needle aspiration or surgical resection
4	Follicular neoplasm	50% (28-100%)	Surgical resection
5	Suspicious for malignancy	81% (40-100%)	Surgical resection
6	Malignant	98% (86-100%)	Surgical resection

Fine needle aspiration (FNA) for the evaluation of thyroid nodules results in indeterminate cytology in 20% to 30% of cases. Thyroid nodules classified as indeterminate are the leading challenge for both cytopathologists and treating clinicians since the indeterminate diagnostic categories can lead to

unnecessary surgical interventions and higher health care costs in almost 20–25% of indeterminate lesions [3]. Use of molecular panel testing (such as ThyroSeq V2 testing) leads to more timely and accurate diagnosis, which can improve patient outcomes and help patients avoid unnecessary follow-up FNAs and surgical procedures. The fourth quality action requirement of this measure, to directly communicate the recommendation for genetic testing to the treating clinician or patient, also allows for the pathologist to take a stronger role in enforcing care coordination and effective communication.

The ThyroSeq V2. 1 multi-gene next-generation sequencing panel is effective at predicting a diagnosis of thyroid cancer in nodules with indeterminate cytology. The ThyroSeq v2 next-generation molecular marker significantly improves the diagnosis of cancer in thyroid nodules found to be FN/SFN on thyroid biopsy. The method appears to be highly accurate (92%) in classifying these thyroid nodules as malignant or benign [1,2].

MEASURE TESTING AND GAP ANALYSIS:
A sample of 3,015 pathology reports for thyroid nodule fine needle aspiration (FNA) specimens across a 6-month period, encompassing 16 pathology practices and 76 providers was reviewed.
Results showed only 6.21% of the 3,015 FNA pathology reports reviewed documented the diagnostic category, range of estimated risk of malignancy (ROM), and clinical management option(s) in accordance with the Bethesda System for Reporting Cytopathology, 3rd edition (2023).

In our review, this measure was found to be applicable to 100% of MSN QCDR pathology clients, with the lowest annual eligible encounters per TIN at 38 and the highest at 2,214, with an average eligible count per group of 370 per year.

References:

1. Nikiforov YE, Carty SE, Chiosea SI, Coyne C, Duvvuri U, Ferris RL, Gooding WE, Hodak SP, LeBeau SO, Ohori NP, Seethala RR, Tublin ME, Yip L, Nikiforova MN. Highly accurate diagnosis of cancer in thyroid nodules with follicular neoplasm/suspicious for a follicular neoplasm cytology by ThyroSeq v2 next-generation sequencing assay. Cancer. 2014 Dec 1;120(23):3627-34. doi: https://doi.org/10.1002/cncr.29038.
2. Nikiforova MN, Wald AI, Roy S, Durso MB, Nikiforov YE. Targeted next-generation sequencing panel (ThyroSeq) for detection of mutations in thyroid cancer. J Clin Endocrinol Metab. 2013 Nov;98(11):E1852-60. doi: https://doi.org/10.1210/jc.2013-2292.
3. Rossi ED, Pantanowitz L, Faquin WC. The Role of Molecular Testing for the Indeterminate Thyroid FNA. Genes (Basel). 2019 Sep 23;10(10):736. doi: https://doi.org/10.3390/genes10100736.
4. Ali SZ, Baloch ZW, Cochand-Priollet B, Schmitt FC, Vielh P, VanderLaan PA. The 2023 Bethesda System for Reporting Thyroid Cytopathology. Thyroid. 2023 Sep;33(9):1039-1044. doi: https://doi.org/10.1089/thy.2023.0141.
5. Ali SZ, Baloch ZW, Cochand-Priollet B, Schmitt FC, Vielh P, VanderLaan PA. The 2023 Bethesda system for reporting thyroid cytopathology. Thyroid. 2023 Sep 1;33(9):1039-44. doi: https://doi.org/10.1089/thy.2023.0141.

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Appropriate Use of Healthcare
NQS Domain: Communication and Care Coordination
Measure Type: Process
Data Source: Paper medical record; Record review
Care Setting(s): Ambulatory; Ambulatory Care: Clinician Office/Clinic; Ambulatory Care: Hospital; Ambulatory Care: Urgent Care; Ambulatory Surgical Center; Emergency Department and Services; Hospital; Hospital Inpatient; Hospital Outpatient; Outpatient Services
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS; MVP
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =
Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures) / Eligible Population / Denominator (c=100 procedures) = 100 procedures / 100 procedures = **100.00%**

Performance Rate =
Performance Met (a=40 procedures) / (Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures)) = 40 procedures / 80 procedures = **50.00%**

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM33: Immunohistochemistry (IHC) and/or Molecular BRAF Testing Status in Metastatic Melanoma

- **National Quality Strategy Domain: Patient Safety**
- **Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final immunohistochemical staining reports for patients with an initial diagnosis of metastatic melanoma that contain a recommendation for, or the results of, BRAF testing (either by immunohistochemistry (IHC) or molecular testing).

INSTRUCTIONS:
This measure is to be submitted **each time** a final immunohistochemical staining report is completed for patients with an initial diagnosis of metastatic melanoma during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final immunohistochemical staining reports for patients with an initial diagnosis of metastatic melanoma.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88342
AND
Primary Diagnosis of Melanoma (ICD-10-CM): C43.0, C43.10, C43.111, C43.112, C43.121, C43.122, C43.20, C43.21, C43.22, C43.30, C43.30, C43.31, C43.39, C43.4, C43.51, C43.52, C43.59, C43.60, C43.61, C43.62, C43.70, C43.71, C43.72, C43.8, C43.9, Z85.820
AND
Diagnosis of Metastatic Disease (ICD-10-CM): C76.0, C76.1, C76.2, C76.3, C76.40, C76.41, C76.42, C76.50, C76.51, C76.52, C76.8, C77.0, C77.1, C77.2, C77.3, C77.4, C77.5, C77.8, C77.9, C78.00, C78.01, C78.02, C78.1, C78.2, C78.30, C78.39, C78.4, C78.5, C78.6, C78.7, C78.80, C78.89, C79.00, C79.01, C79.02, C79.10, C79.11, C79.19, C79.2, C79.31,

C79.32, C79.40, C79.49, C79.51, C79.52, C79.60, C79.61, C79.62, C79.70, C79.71, C79.72, C79.81, C79.82, C79.89, C79.9

Denominator Exclusion(s): Previously diagnosed metastatic melanoma (**DE033**)

NUMERATOR:
Final immunohistochemical staining reports for patients with an initial diagnosis of metastatic melanoma that document a recommendation for or the results of BRAF testing (either by immunohistochemistry (IHC) or molecular testing*).

***Numerator Note:** All eligible reports **must** document a recommendation by the Pathologist for BRAF testing OR the results of BRAF testing (current or previous), OR that BRAF testing is currently pending.*

Numerator Options:
Performance Met:
PM033: Final pathology report includes a recommendation for OR the results of BRAF testing (either by immunohistochemistry (IHC) or molecular testing).

OR

Performance Not Met:
PNM33: Final pathology report does not include a recommendation for OR the results of BRAF testing (either by immunohistochemistry (IHC) or molecular testing).

OR

Denominator Exception:
PE033: Documentation of technical or medical reason(s) for not including a recommendation for OR the results of BRAF testing (either by immunohistochemistry (IHC) or molecular testing) (e.g., limited specimen quantity precludes additional testing).

RATIONALE:
Malignant melanoma is the deadliest form of skin cancer. It is estimated to affect more than 100,000 individuals, causing approximately 7,000 deaths in the United States in 2020 [3]. The treatment of metastatic disease has been a challenge in the recent past, with a low survival rate of approximately 20% at 5 years for stage IV patients. Nevertheless, the introduction of new therapeutic approaches, such as targeted therapy and immunotherapy, based on a growing understanding of molecular alterations involved in melanoma pathogenesis, has significantly improved outcomes for patients [4].

BRAF is a human gene found on chromosome seven that encodes a protein also called B-RAF. The B-RAF protein helps transmit chemical signals from outside the cell to the cell's nucleus, controlling cell functions like growth, differentiation, cell movement, and apoptosis. When the BRAF gene is mutated, it can cause normal cells to become cancerous [3].

As approximately 50% of advanced melanomas (i.e., unresectable Stage III or metastatic Stage IV, according to the American Joint Committee on Cancer Staging Manual, 8th edition) harbor a mutation in the BRAF gene, and since the Federal Drug Administration and the European Institutions approved targeted therapy with BRAF and MAPK kinase inhibitors, molecular testing for codon V600 of the BRAF

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

oncogene became an integral part of the management of such patients [1]. Identification of the underlying gene mutation expands the treatment plan options and can lead to better health outcomes for the patient. As useful as BRAF testing is in determining the most effect treatment plan, however, it is still not widely adopted as standard practice, as reflected by the results of the gap analysis below.

The discovery of activating BRAF mutations in half of all melanomas has led to the development of molecularly targeted therapy with BRAF and MEK inhibitors, which dramatically improved outcomes of patients with stage IV BRAF-mutant melanoma. The NCCN clinical practice guidelines recommend BRAF mutation testing in patients with metastatic melanoma to guide treatment decisions. Immunohistochemistry (IHC) is one antibody-based test developed and currently used for the detection of BRAF mutations. IHCs are a highly sensitive and specific test that only requires two tissue slides and no specialized equipment. IHCs are inexpensive and results are obtained within 48 hours. In one study, the IHC yielded a final Predictive Positive Value (PPV) of 100% and a Negative Predictive Value (NPV) of 93% calculated with V600E mutated samples only [2].

BRAF molecular testing is currently imperative for the classification of stages III and IV malignant melanoma patients, toward the selection of the appropriate therapeutic strategy [3].

MEASURE TESTING AND GAP ANALYSIS:
A sample of 253 pathology reports for patients with a diagnosis of Primary Melanoma and Secondary Metastatic Disease across a six-month period, encompassing 16 pathology practices and 61 providers were reviewed.

Results showed only 31.58% of the 253 reports reviewed included a recommendation for or the results of immunohistochemistry (IHC) and/or molecular BRAF testing.

In our review, this measure was found to be applicable to 53% of MSN QCDR pathology clients, with the lowest annual eligible encounters per TIN at 20 and the highest at 166, with an average eligible count per group of 51 per year.

CLINICAL RECOMMENDATION STATEMENT:
National Comprehensive Cancer Network (NCCN):
PRINCIPLES OF MOLECULAR TESTING FOR MELANOMA: CUTANEOUS:
- BRAF mutation testing is recommended for patients with stage III at high risk for recurrence for whom future BRAF-directed therapy may be an option.
- For initial presentation with stage IV disease or clinical recurrence, obtain tissue to ascertain alterations in BRAF from either biopsy of the metastasis (preferred) or archival material if the patient is being considered for targeted therapy. Broader genomic profiling (eg, larger NGS panels, BRAF non-V600 mutations) is recommended if feasible, especially if the test results might guide future treatment decisions or eligibility for participation in a clinical trial.
- If BRAF single-gene testing was the initial test performed, and is negative, clinicians should strongly consider larger NGS panels to identify other potential genetic targets (eg, KIT, BRAF non-V600) [7].

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

References:

1. Rusu S, Verocq C, Trepant AL, Maris C, De Nève N, Blanchard O, Van Campenhout C, De Clercq S, Rorive S, Cotoi OS, Decaestecker C, Salmon I, D'Haene N. Immunohistochemistry as an accurate tool for the assessment of BRAF V600E and TP53 mutations in primary and metastatic melanoma. Mol Clin Oncol. 2021 Dec;15(6):270. doi: http://doi.org/10.3892/mco.2021.2432.
2. Siroy AE, Boland GM, Milton DR, Roszik J, Frankian S, Malke J, Haydu L, Prieto VG, Tetzlaff M, Ivan D, Wang WL. Beyond BRAFV600: clinical mutation panel testing by next-generation sequencing in advanced melanoma. Journal of Investigative Dermatology. 2015 Feb 1;135(2):508-15. doi: https://doi.org/10.1038/jid.2014.366.
3. Cheng L, Lopez-Beltran A, Massari F, MacLennan GT, Montironi R. Molecular testing for BRAF mutations to inform melanoma treatment decisions: a move toward precision medicine. Modern Pathology. 2018 Jan 1;31(1):24-38. doi: https://doi.org/10.1038/modpathol.2017.104.
4. Vanni I, Tanda ET, Spagnolo F, Andreotti V, Bruno W, Ghiorzo P. The current state of molecular testing in the BRAF-mutated melanoma landscape. Frontiers in Molecular Biosciences. 2020 Jun 30;7:113. doi: https://doi.org/10.3389/fmolb.2020.00113.
5. Colombino M, Rozzo C, Paliogiannis P, Casula M, Manca A, Doneddu V, Fedeli MA, Sini MC, Palomba G, Pisano M, Ascierto PA. Comparison of BRAF mutation screening strategies in a large real-life series of advanced melanoma patients. Journal of Clinical Medicine. 2020 Jul 30;9(8):2430. doi: https://doi.org/10.3390/jcm9082430.
6. Pellegrini C, Cardelli L, De Padova M, Di Nardo L, Ciciarell V, Rocco T, Cipolloni G, Clementi M, Cortellini A, Ventura A, Leocata P. Intra-patient heterogeneity of BRAF and NRAS molecular alterations in primary melanoma and metastases. Acta Dermato-Venereologica. 2020;100(1). doi: https://doi.org/10.2340/00015555-3382.
7. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Melanoma: Cutaneous. NCCN Org: Version. 2022 Dec;1.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease
NQS Domain: Patient Safety
Measure Type: Process
Data Source: Record review; Paper medical record; Hybrid
Care Setting(s): All Settings
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =

$$\frac{\text{Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures)}}{\text{Eligible Population / Denominator (c=100 procedures)}} = \frac{\text{100 procedures}}{\text{= 100 procedures}} = \textbf{100.00\%}$$

Performance Rate =

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures)}} = \frac{\text{40 procedures}}{\text{= 80 procedures}} = \textbf{50.00\%}$$

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM34: Use of Appropriate Scoring System for Immunohistochemistry (IHC) for HER2/neu Testing for Invasive Breast Cancer

- **National Quality Strategy Domain: Patient Safety**
- **Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final pathology reports for immunohistochemistry (IHC) for HER2/neu testing for invasive breast cancer that include interpretation of the results in accordance with the 2018, 2023 or later ASCO-CAP Guideline Update.

INSTRUCTIONS:
This measure is to be submitted **each time** a final pathology report for immunohistochemistry (IHC) for HER2/neu testing for invasive breast cancer is completed for patients with a diagnosis of breast cancer during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final pathology reports for immunohistochemistry (IHC) for HER2/neu testing for invasive breast cancer.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88360, 88361
AND
Diagnosis of Breast Cancer (ICD-10-CM): C50.011, C50.012, C50.019, C50.021, C50.022, C50.029, C50.111, C50.112, C50.119, C50.121, C50.122, C50.129, C50.211, C50.212, C50.219, C50.221, C50.222, C50.229, C50.311, C50.312, C50.319, C50.321, C50.322, C50.329, C50.411, C50.412, C50.419, C50.421, C50.422, C50.429, C50.511, C50.512, C50.519, C50.521, C50.522, C50.529, C50.611, C50.612, C50.619, C50.621, C50.622, C50.629, C50.811, C50.812, C50.819, C50.821, C50.822, C50.829, C79.81

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Denominator Exclusion(s):
IHC for HER2/neu testing not performed (e.g., on microinvasion) **(DE034)**
OR
HER2 FISH performed as primary test **(DE034)**

NUMERATOR:
Final pathology reports for immunohistochemistry (IHC) for HER2/neu testing for invasive breast cancer that interpret the results in accordance with the 2018, 2023 or later ASCO-CAP Guideline Update*.

***Numerator Note #1:** All eligible reports **must** interpret results in accordance with the following algorithm for evaluation of human epidermal growth factor receptor 2 (HER2) protein expression by immunohistochemistry (IHC) assay of the invasive component of a breast cancer specimen per the 2018/2023 ASCO-CAP Guideline Update [1]:*

- ***IHC 3+ POSITIVE:** Circumferential membrane staining that is complete, intense and in > 10% of tumor cells*
- ***IHC 2+ EQUIVOCAL:** Weak to moderate complete membrane staining observed in > 10% of tumor cells*
- ***IHC 1+ NEGATIVE:** Incomplete membrane staining that is faint/barely perceptible and in > 10% of tumor cells*
- ***IHC 0 NEGATIVE:** No staining is observed, or Membrane staining that is incomplete and is faint/barely perceptible and in < 10% of tumor cells*

***Numerator Note #2:** Documenting "Cold ischemia and fixation times meet the latest version of the ASCO-CAP Guidelines" alone does not meet the intent of this measure. The ASCO-CAP Guideline Update citation **must** be in reference specifically to the HER2/neu testing results interpretation.*

Numerator Options:
Performance Met:
PM034: Final pathology report includes interpretation of IHC for HER2/neu testing results in accordance with the 2018, 2023 or later ASCO-CAP Guideline Update, including test type, primary antibody (must cite source).

OR

Performance Not Met:
PNM34: Final pathology report does not include interpretation of IHC for HER2/neu testing results in accordance with the 2018, 2023 or later ASCO-CAP Guideline Update AND/OR source not cited.

OR

Denominator Exception:
PE034: Documentation of technical reason(s) for not including interpretation of IHC for HER2/neu testing results in accordance with the 2018, 2023 or later ASCO-CAP Guideline Update (e.g., limited specimen quantity precludes additional testing).

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

RATIONALE:
HER2 testing guidelines focus on identifying HER2 protein overexpression or gene amplification in breast cancer to identify patients for therapies that disrupt HER2 signaling. Such information leads to a more tailored, effective treatment plan and ultimately a more positive outcome [6].

The use of recent and relevant models for interpreting IHC for HER2/neu testing results ensures pathology results are accurately and effectively interpreted. Guidelines have changed over the years, yet providers often times are slow to adopt the newest guidelines released, or are unclear as to which guidelines they are using when providing classifications, which can lead to confusion or misinterpretation. To ensure accurate classification and avoid misdiagnoses, it is necessary to adopt standardized procedures, guidelines, and specialized training for pathologists in interpreting HER2 expression in the lower spectrum [2].

Pathologists need to be aware that an IHC 0 vs IHC 1+ result may change treatment options for patients with metastatic breast cancer since patients with IHC 1+ and 2+/ISH-negative results are now eligible for treatment with trastuzumab–deruxtecan. Previously, an IHC 0 versus IHC 1+ result made little clinical difference [5].

MEASURE TESTING AND GAP ANALYSIS:
A sample of 2,143 pathology reports for patients with a diagnosis of Breast Cancer across a six-month period, encompassing 14 pathology practices and 96 providers were reviewed.

Results showed only 23.48% of the 2,143 reports reviewed included interpretation of IHC for HER2/neu testing results in accordance with the latest version ASCO-CAP Guideline Update.

In our review, this measure was found to be applicable to 88% of MSN QCDR pathology clients, with the lowest annual eligible encounters per TIN at 20 and the highest at 960, with an average eligible count per group of 335 per year.

CLINICAL RECOMMENDATION STATEMENT(S):
College of American Pathologists (CAP) and American Society of Clinical Oncology (ASCO):
The 2023 “Human Epidermal Growth Factor Receptor 2 (HER2) Breast Testing Guideline Update” reaffirms the 2018 “HER2 Breast Testing Guideline Focused Update.” This reaffirmation was propelled by results of the 2022 DESTINY-Breast04 trial, which prompted the United States Food and Drug Administration (FDA) to expand the approval of the HER2 antibody-drug conjugate, trastuzumab deruxtecan, from metastatic breast cancer patients with HER2 protein over-expression/amplification to also include metastatic patients with HER2 IHC 1+ or 2+/ISH negative results [4].

This guideline update does not support the use of a HER2-Low interpretive category because the DESTINY-Breast04 trial did not include patients with HER2 IHC 0 results, there is no evidence to support that IHC 1+ or 2+/ISH negative results are predictive of trastuzumab deruxtecan treatment response when compared to IHC 0 results. Therefore, the FDA expansion of approval to this group was only based on clinical trial eligibly criteria rather than a new predictive indication for HER2 testing [4].

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

References:

1. Wolff AC, Somerfield MR, Dowsett M, Hammond ME, Hayes DF, McShane LM, Saphner TJ, Spears PA, Allison KH. Human epidermal growth factor receptor 2 testing in breast cancer: ASCO–College of American Pathologists Guideline Update. Journal of Clinical Oncology. 2023 Aug 1;41(22):3867-72. doi: https://doi.org/10.5858/arpa.2023-0950-SA.
2. Ivanova M, Porta FM, D'Ercole M, Pescia C, Sajjadi E, Cursano G, De Camilli E, Pala O, Mazzarol G, Venetis K, Guerini-Rocco E. Standardized pathology report for HER2 testing in compliance with 2023 ASCO/CAP updates and 2023 ESMO consensus statements on HER2-low breast cancer. Virchows Archiv. 2024 Jan;484(1):3-14. doi: https://doi.org/10.1007/s00428-023-03656-w.
3. Rice S. A scan of studies on HER2-low breast cancer scoring. CAP Today. 2024 Jan. A scan of studies on HER2-low breast cancer scoring - CAP TODAY (captodayonline.com).
4. College of American Pathologists (CAP), American Society of Clinical Oncology (ASCO). Her2 Testing in Breast Cancer - 2023 Guildeline Update. 2023 Jun 7. https://www.cap.org/protocols-and-guidelines/cap-guidelines/current-cap-guidelines/recommendations-for-human-epidermal-growth-factor-2-testing-in-breast-cancer.
5. Kuhl E. ASCO-CAP guideline update confirms previous recommendations for HER2 testing in breast cancer. ASCO Daily News. 2023 Jun 8. https://dailynews.ascopubs.org/do/asco-cap-guideline-update-confirms-previous-recommendations-her2-testing-breast-cancer.
6. Wolff AC, Somerfield MR, Dowsett M, Hammond ME, Hayes DF, McShane LM, Saphner TJ, Spears PA, Allison KH. Human epidermal growth factor receptor 2 testing in breast cancer: ASCO–College of American Pathologists Guideline Update. Journal of Clinical Oncology. 2023 Aug 1;41(22):3867-72. doi: https://doi.org/10.1200/JCO.22.02864.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease
NQS Domain: Patient Safety
Measure Type: Process
Data Source: Record review; Paper medical record; Hybrid
Care Setting(s): All Settings
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =

$$\frac{\text{Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures)}}{\text{Eligible Population / Denominator (c=100 procedures)}} = \frac{\text{100 procedures}}{\text{= 100 procedures}} = \textbf{100.00\%}$$

Performance Rate =

$$\frac{\text{Performance Met (a=40 procedures)}}{\text{Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures)}} = \frac{\text{40 procedures}}{\text{= 80 procedures}} = \textbf{50.00\%}$$

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM35: P16 Immunohistochemistry (IHC) Staining Status in Oropharyngeal Squamous Cell Carcinoma (OPSCC)

- **National Quality Strategy Domain: National Quality Strategy Domain: Patient Safety**
- **Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final FNA or biopsy reports for patients with an initial diagnosis of primary oropharyngeal squamous cell carcinoma (OPSCC) that contain the results of P16 immunohistochemistry (IHC) staining.

INSTRUCTIONS:
This measure is to be submitted **each time** a final immunohistochemical staining report is completed for patients with an initial diagnosis of primary oropharyngeal squamous cell carcinoma (OPSCC) during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final FNA or biopsy reports for patients of any age with an initial diagnosis of primary oropharyngeal squamous cell carcinoma (OPSCC).

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88305, 88307, 88309
AND
Diagnosis of Primary Oropharyngeal Squamous Cell Carcinoma (OPSCC) (ICD-10-CM):
C01, C05.1, C09.0, C09.1, C09.8, C09.9, C10.0, C10.1, C10.2, C10.3, C10.4, C10.8, C10.9, C77.0, D00.04

Denominator Exclusion(s): Anatomical site other than the oropharynx or regional lymph nodes (i.e., anatomical site other than the soft palate, uvula, palatine tonsils, tonsillar pillars,

base of tongue (lingual tonsils), posterior pharyngeal wall, vallecula, levels I–V cervical lymph nodes, retropharyngeal nodes, or parapharyngeal nodes) **(DE035)**

OR

Previously diagnosed oropharyngeal squamous cell carcinoma (OPSCC) **(DE035)**

OR

Carcinoma other than primary oropharyngeal squamous cell carcinoma (OPSCC) **(DE035)**

NUMERATOR:

Final FNA or biopsy reports for patients with an initial diagnosis of oropharyngeal squamous cell carcinoma (OPSCC) that contain the results of P16 immunohistochemistry (IHC) staining*****.

***Numerator Note:** Documentation **must** include the results of P16 immunohistochemistry (IHC) staining (i.e., positive/"HPV-associated" or negative/"HPV-independent"). Documentation that the results of P16 IHC staining are pending does not meet the performance requirement for this measure.*

Numerator Options:

Performance Met:

PM035: Final pathology report includes the results of P16 immunohistochemistry (IHC) staining.

OR

Performance Not Met:

PNM35: Final pathology report does not include the results of P16 immunohistochemistry (IHC) staining.

OR

Denominator Exception:

PE035: Documentation of clinical reason(s) for not including the results of P16 immunohistochemistry (IHC) staining (e.g., alternative High-Risk HPV testing performed (such as, RNA-ISH or DNA PCR) or P16 staining unperformable/uninterpretable due to insufficient remaining tissue).

RATIONALE

Understanding the cause of a patient's primary oropharyngeal squamous cell carcinoma (OPSCC) is crucial for guiding clinical management, prognosis, and treatment decisions. OPSCC can arise from different etiologies, most notably tobacco and alcohol use or infection with high-risk human papillomavirus (HPV). HPV-positive OPSCC typically has a better prognosis, responds more favorably to treatment, and may be eligible for de-escalated therapy to reduce long-term side effects. In contrast, HPV-negative OPSCC often has a more aggressive course and may require more intensive treatment.

A key diagnostic tool in determining HPV-related OPSCC is the use of **p16 immunohistochemistry staining**, which serves as a reliable surrogate marker for transcriptionally active HPV infection. Overexpression of p16 is strongly associated with HPV-positive tumors and is widely used in clinical practice to stratify patients into prognostic and therapeutic categories. Identifying the underlying cause—particularly HPV status through p16 staining—not only informs staging and treatment

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

decisions but also plays a critical role in patient counseling, surveillance strategies, and public health initiatives such as HPV vaccination advocacy.

CLINICAL RECOMMENDATION STATEMENTS:

College of American Pathologists (CAP):

Pathologists should perform HR-HPV testing on all patients with newly diagnosed OPSCC, including all histologic subtypes. This testing may be performed on the primary tumor or on a regional lymph node metastasis when the clinical findings are consistent with an oropharyngeal primary.

For oropharyngeal tissue specimens (i.e., noncytology), including regional lymph nodes with metastatic SCC and clinical findings consistent with an oropharyngeal primary, pathologists should perform HR-HPV testing by surrogate marker p16 IHC [1].

National Comprehensive Cancer Network (NCCN):

PRINCIPLES OF P16 TESTING FOR HPV-MEDIATED OROPHARYNGEAL CANCER

- P16 expression correlates with HPV status in geographic regions where HPV is etiologically responsible for a high proportion of cancers.
- Distinguishing p16+ patients by HPV tumor status informs prognosis. Patients with p16+ and HPV+ tumors have an improved prognosis compared to patients with p16+ and HPV-negative tumors [2].

MEASURE TESTING AND GAP ANALYSIS:

We sampled 110 pathology reports for patients with a malignant neoplasm of the oropharynx or regional lymph node(s) diagnosis across a six-month period and found 91 reports for patients with an initial diagnosis of primary oropharyngeal squamous cell carcinoma (OPSCC), encompassing 14 pathology practices and 56 providers.

Results showed only 84% of the 91 reports included the results of P16 immunohistochemistry (IHC) staining.

In our review, this measure was found to be applicable to 85% of MSN QCDR pathology clients, with the lowest annual eligible encounters per TIN at 20 and the highest above 1,000, with an average eligible count per group of approximately 239 per year.

References:

1. Lewis Jr JS, Beadle B, Bishop JA, Chernock RD, Colasacco C, Kalicanin T, Krane JF, Lacchetti C, Moncur JT, Rocco JW, Schwartz MR. Human Papillomavirus Testing in Head and Neck Carcinomas: Guideline Update. Archives of pathology & laboratory medicine. 2025 Jun 1;149(6):e115-50. doi: https://doi.org/10.5858/arpa.2024-0388-CP.
2. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Head and Neck Cancers. NCCN Org: Version. 2025 Jan;2.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease
NQS Domain: Patient Safety
Measure Type: Process
Data Source: Paper medical record; Record review; Hybrid; Claims
Care Setting(s): All Settings
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =
Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures) = 100 procedures = **100.00%**
Eligible Population / Denominator (c=100 procedures) = 100 procedures

Performance Rate =
Performance Met (a=40 procedures) = 40 procedures = **50.00%**
Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures) = 80 procedures

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Quality ID #QMM36: P53 Immunohistochemistry (IHC) Staining Status in Endometrial Carcinoma
- **National Quality Strategy Domain: Patient Safety**
- **Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease**

2026 COLLECTION TYPE:
QUALIFIED CLINICAL DATA REGISTRY QUALITY MEASURE (QCDR)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of final pathology reports for endometrial biopsy, dilation and curettage (D&C) material, or hysterectomy specimen with an initial diagnosis of primary endometrial carcinoma that contain the results of P53 immunohistochemistry (IHC) staining.

INSTRUCTIONS:
This measure is to be submitted **each time** a final pathology report is completed on endometrial biopsy, dilation and curettage (D&C) material, or hysterectomy specimen with an initial diagnosis of primary endometrial carcinoma during the performance period.

Measure Submission Type:
Measure data may only be submitted by the measure steward or third-party-intermediaries possessing licensing rights from the measure steward. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

DENOMINATOR:
All final pathology reports for endometrial biopsy, dilation and curettage (D&C) material, or hysterectomy specimen with an initial diagnosis of primary endometrial carcinoma.

Denominator Criteria (Eligible Cases):
All patients, regardless of age,
AND
Patient procedure during the performance period (CPT): 88305, 88307, 88309
AND
Diagnosis of Primary Endometrial Carcinoma (ICD-10-CM): C54.0, C54.1, C54.2, C54.3, C54.8, C54.9

Denominator Exclusion(s):
Anatomical site other than the endometrium **(DE036)**
OR
Previously diagnosed endometrial carcinoma **(DE036)**

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

NUMERATOR:
Final pathology reports for endometrial biopsy, dilation and curettage (D&C) material, or hysterectomy specimen with an initial diagnosis of primary endometrial carcinoma that contain the results of P53 immunohistochemistry (IHC) staining*.

***Numerator Note:** Documentation **must** include the results of P53 immunohistochemistry (IHC) staining (i.e., normal/wild-type or abnormal/aberrant/mutation-type (aka, complete absence, overexpression, or cytoplasmic)). Documentation that the results of P53 IHC staining are pending does not meet the performance requirement for this measure.*

Numerator Options:
Performance Met:
PM036: Final pathology report includes the results of P53 immunohistochemistry (IHC) staining.

OR

Performance Not Met:
PNM36: Final pathology report does not include the results of P53 immunohistochemistry (IHC) staining.

OR

Denominator Exception:
PE036: Documentation of clinical reason(s) for not including the results of P53 immunohistochemistry (IHC) staining (e.g., uninterpretable due to insufficient remaining tissue).

RATIONALE:
Knowing the results of p53 immunohistochemistry staining in patients diagnosed with endometrial carcinoma is important for accurate tumor classification, prognosis, and treatment planning. Abnormal p53 staining patterns, typically indicative of TP53 gene mutations, are strongly associated with high-grade, aggressive tumor subtypes and correlate with poorer clinical outcomes. In contrast, normal p53 staining is more often seen in lower-grade, less aggressive tumors. Integrating p53 staining results into the diagnostic workup helps refine histologic classification allowing for more personalized and risk-adapted management strategies.

The results of a recent study showed that, compared to patients with no specific molecular profile (NSMP), patients with POLE mutant grade 3 endometrioid endometrial carcinomas (EEC) had a significantly better prognosis, while patients with p53 abnormal tumors had a significantly worse recurrence-free survival (RFS) rate [1].

In a multivariable Cox model that included age and FIGO stage, POLE status was an independent prognostic factor for better RFS, and p53 status was an independent prognostic factor for worse RFS [1].

MSN HEALTHCARE SOLUTIONS

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

CLINICAL RECOMMENDATION STATEMENT(S):

National Comprehensive Cancer Network (NCCN):

PRINCIPLES OF MOLECULAR ANALYSIS FOR ENDOMETRIAL CARCINOMA

- Molecular analysis of endometrial carcinoma has identified four clinically significant molecular subgroups associated with differing clinical prognoses: POLE mutations, microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR), no specific molecular profile (NSMP), and p53 aberrant.
- Retrospective analyses indicate that these four molecular subgroups may respond to therapy differently and therefore may require escalation or de-escalation of therapy compared to previous guidelines.
- Ancillary studies for POLE mutations (pathogenic mutations in the exonuclease domain), immunohistochemical (IHC) staining for mismatch repair (MMR) or MSI testing, and p53 IHC are recommended to complement morphologic assessment regardless of histologic tumor type.
- Molecular testing may be performed on the initial biopsy or D&C material or the final hysterectomy specimen [2].

MEASURE TESTING AND GAP ANALYSIS:

A sample of 109 pathology reports for patients with an initial diagnosis of endometrial carcinoma across a six-month period, encompassing 13 pathology practices and 60 providers, were reviewed.

Results showed only 69% of the 109 reports reviewed included the results of P53 immunohistochemistry (IHC) staining.

In our review, this measure was found to be applicable to 70% of MSN QCDR pathology clients, with the lowest annual eligible encounters per TIN at 20 and the highest above 1200, with an average eligible count per group of approximately 256 per year.

References:

1. Bosse T, Nou RA, McAlpine JN, McConechy MK, Britton H, Hussein YR, Gonzalez C, Ganesan R, Steele JC, Harrison BT, Oliva E. Molecular classification of grade 3 endometrioid endometrial cancers identifies distinct prognostic subgroups. The American journal of surgical pathology. 2018 May 1;42(5):561-8. doi: https://doi.org/10.1097/PAS.0000000000001020
2. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Uterine Neoplasms. NCCN Org: Version. 2025 Mar;3.

2357 Warm Springs Road, Suite 400
Columbus, GA 31904
MSNLLC.COM

Meaningful Measure Area: Promote Effective Prevention and Treatment of Chronic Disease
NQS Domain: Patient Safety
Measure Type: Process
Data Source: Paper medical record; Record review; Hybrid; Claims
Care Setting(s): All Settings
Measure Stewards: MSN Healthcare Solutions, LLC
Number of Performance Rates: 1
Inverse Measure: No
High Priority Measure: Yes – Care Coordination
Telehealth Measure: No
Proportion Measure Scoring: Yes
Continuous Measure Scoring: No
Ratio Measure Scoring: No
MIPS Reporting Option(s): Traditional MIPS
Risk adjustment: No
NQF Number: Not applicable
eCQM Number: Not applicable

SAMPLE CALCULATIONS:

Data Completeness =
Performance Met (a=40 procedures) + Numerator Exclusion (b=20 procedures) + Performance Not Met (b=40 procedures) = 100 procedures = **100.00%**
Eligible Population / Denominator (c=100 procedures) = 100 procedures

Performance Rate =
Performance Met (a=40 procedures) = 40 procedures = **50.00%**
Data Completeness Numerator (100 procedures) – Numerator Exclusion (20 procedures) = 80 procedures

ABG 44: Low Flow Inhalational General Anesthesia

MEASURE DESCRIPTION:
Percentage of patients aged 18 years or older, who undergo an elective procedure lasting 30 minutes or longer requiring inhalational general anesthesia who during the maintenance phase of the anesthetic have a total fresh gas flow less than or equal to 1 L/min (less than or equal to 2 L/min for Sevoflurane).

NQS DOMAIN/MEANINGFUL MEASURES AREA:
Efficient Use of Healthcare Resources/Clinical Process/Effectiveness

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 in which inhalational general anesthesia is used. 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 lasting 30 minutes or longer requiring inhalational general anesthesia. (**1095**)

- Denominator Criteria (Eligible Cases):

  Patients aged 18 years and older

  AND

  Elective procedure

  AND

  Patient who receives inhalational general anesthesia

  AND

  Procedure lasts 30 minutes or longer

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, 00566, 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, 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, 01112, 01120, 01130, 01140, 01150, 01160, 01170, 01173, 01200, 01202, 01210, 01212, 01214, 01215, 01220, 01230, 01232, 01234, 01250, 01260, 01270, 01272, 01274, 01320, 01340, 01360, 01380, 01382, 01390, 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, 01924, 01925, 01926, 01930, 01931, 01932, 01933, 01935, 01936, 01951, 01952, 01961, 01962, 01963, 01965, 01966

- Denominator Exceptions:

  Patient or technical reason exists for not providing low flow inhalational anesthesia (e.g., flow meter not capable of generating low flows, patient hypermetabolic, lack of CO2 absorbents without KOH and low concentrations of NaOH, etc.) (**1096**)

NUMERATOR:

Patients who undergo an elective procedure lasting 30 minutes or longer requiring inhalational general anesthesia who during the maintenance phase of the anesthetic have a total fresh gas flow less than or equal to1 L/min (less than or equal to 2 L/min for Sevoflurane).

Numerator Note: Inhalational general anesthesia is defined as the use of at least one inhalational anesthetic gas (e.g., halothane, isoflurane, desflurane, sevoflurane, nitrous oxide) as the primary mode of anesthesia for the procedure.

Numerator Note: The maintenance phase of the inhalational anesthetic is defined as the portion of the case in which Stage III surgical anesthesia (e.g., unconsciousness, amnesia, immobility, unresponsive to surgical stimulation) is achieved at a safe anesthetic depth while also maintaining respiratory and hemodynamic stability. This occurs between the induction and emergence phases of the case.1

Numerator Note: Fresh gas flow (FGF) is defined as the combined admixture of medical gases such as air, oxygen, or nitrous oxide as well as volatile anesthetics as set by the anesthesia provider.

- Numerator Options:

Performance Met: The total FGF is reduced to less than or equal to 1 L/min (less than or equal to 2 L/min for Sevoflurane) for the duration of the maintenance phase of the anesthetic (1097).

OR

Performance Not Met: The total FGF is greater than 1 L/min (greater than 2 L/min for Sevoflurane) for the duration of the maintenance phase of the anesthetic (1098).

RELEVANT FIELDS:

- ASA CPT code
- Inhalational agent used
- Anesthesia start
- Anesthesia end
- Emergency status
- Patient age

RATIONALE:

Managing Fresh Gas Flow to Reduce Environmental Contamination

Introduction

When using a circle anesthesia system, any anesthetic gases and vapors that enter the scavenging system will flow through the hospital vacuum system and ultimately be vented outside the hospital to the atmosphere. The total fresh gas flow determines the amount of gas entering the scavenging system per minute. Whenever fresh gas flow exceeds the patient‘s requirement, gases and vapors will enter the scavenging system and ultimately contaminate the atmosphere. By choosing the minimal total fresh gas flow, the environmental impact of anesthetic vapors and gases can be minimized. Although the environmental impact of a single case may be minimal, every practitioner can make a significant difference over the thousands of procedures during their career by practicing careful fresh gas flow management for each case. There are three strategies to minimize fresh gas flow and environmental contamination. To implement these strategies, it is important to understand how to utilize anesthetic agent and oxygen concentration monitors to safely deliver the minimum fresh gas flow.

Strategy #1: Minimize Fresh Gas Flow During Maintenance

With this background, the first strategy to reduce the environmental impact of anesthetic vapors is to minimize the fresh gas flow during the maintenance phase of the case. As an example of a low, or minimal, flow anesthetic technique, consider a case of a 70 kg male requiring general anesthesia. Following intravenous induction, isoflurane was administered using oxygen and air at 2 L/min each for a total fresh gas flow of 4 L/min. Once the exhaled concentration of isoflurane is close to the inspired concentration, uptake from the lungs has slowed and the fresh gas flow can be reduced. Assuming oxygen consumption to be about 350 mL/min, the oxygen flow can be set to 350 mL/min. The air flowmeter can be set at 500 mL/min which would deliver an additional 105 mL/min of oxygen and the total fresh gas flow will be less than 1 L/min. If nitrous oxide is used, the oxygen flowmeter should be set to 500 mL/min at a minimum and nitrous oxide at 500 mL/min.

Managing this technique requires that the inspired oxygen concentration be monitored. If oxygen

consumption exceeds the total oxygen delivered, the inspired oxygen concentration will diminish over time, which will be an indication that oxygen flow needs to be increased. There is still some environmental contamination with this technique, since the total fresh gas flow exceeds what is consumed, but it is easier to manage than a true "closed circuit" technique. Unless the patient has a large oxygen consumption (e.g., trauma, pregnancy) it should be possible during the maintenance phase of anesthesia to limit the fresh gas flow to a maximum of 1 L/minute. For smaller patients with even lower oxygen consumption requirements, the maintenance fresh gas flow can be reduced even further with the same caveat of monitoring inspired oxygen concentration.

Greening the Operating Room and Perioperative Arena: Environmental Sustainability for Anesthesia Practice. Task Force on Environmental Sustainability Committee on Equipment and Facilities, American Society of Anesthesiologists (ASA).

https://www.asahq.org/about-asa/governance-and-committees/asa-committees/committee-on-equipment-and- facilities/environmental-sustainability/greening-the-operating-room#3gas

Described in 1952 by Foldes, the technique of reducing the fresh gas flow during an anesthetic to a level < 1 L/min is both safe and effective.2 Additionally, there are benefits to both the patient, cost savings to the facility and benefits to the environment.3

- The inhalational anesthetic agents sevoflurane isoflurane and desflurane have global warming potentials 2-3 orders of magnitude higher than CO2.3
- Nitrous oxide contributes significantly to global warming and ozone depletion.3
- 5% of the carbon footprint (CO2e) of the British National Health System is attributable to exhaled anesthetic agents.3
- Reducing the environmental impact of anesthesia, can be achieved through behavior change.3
- The chemical properties and global warming impacts of these gases vary, with atmospheric lifetimes of 1−5 years for sevoflurane, 3−6 years for isoflurane, 9−21 years for desflurane, and 114 years for N2O.4
- The conservation of heat and moisture within the breathing system is an added benefit of low flow anesthesia to the patient especially when humidifier connection filters are not used.
- Low flow anesthesia can result in cost savings even when the increased cost of CO2 absorber is factored in,
- especially with regards to usage of Sevoflurane and Desflurane.5
- The simulated low flow anesthesia of 1 L/min FGF across all agents predicted a 48% reduction in costs of volatile anesthetics at a tertiary hospital.6

REPORTING CODES:

ABG 44 Code	Definition
1095	All patients aged 18 years or older, who undergo an elective procedure lasting 30 minutes or longer requiring inhalational general anesthesia.
1096	Patient or technical reason exists for not providing low flow inhalational anesthesia
1097	The total FGF is reduced to less than or equal to 1 L/min (less than or equal to 2 L/min for Sevoflurane) for the duration of the maintenance phase of the anesthetic
1098	The total FGF is greater than 1 L/min (greater than 2 L/min for Sevoflurane) for the duration of the maintenance phase of the anesthetic

Measure Title

AQI18: 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

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

Denominator Exclusions

- Organ donors as designated by ASA Physical Status 6
- Procedure reduced or discontinued prior to initiation of CPB as indicated on the claim by Modifier 52 or Modifier 53
- Transcatheter aortic valve replacement (TAVR) or transcatheter aortic valve implantation (TAVI) cases (CPT codes 33361, 33362, 33363, 33364, 33365, 33366, 33367, 33368, 33369, 93355): **12A38**

Numerator

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

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:

G8569 Prolonged postoperative intubation (> 24 hrs.) required

OR

Performance Not Met:

G8570 Prolonged postoperative intubation (>24 hrs.) not required

CBE 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's 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

Telehealth Reporting Option: No

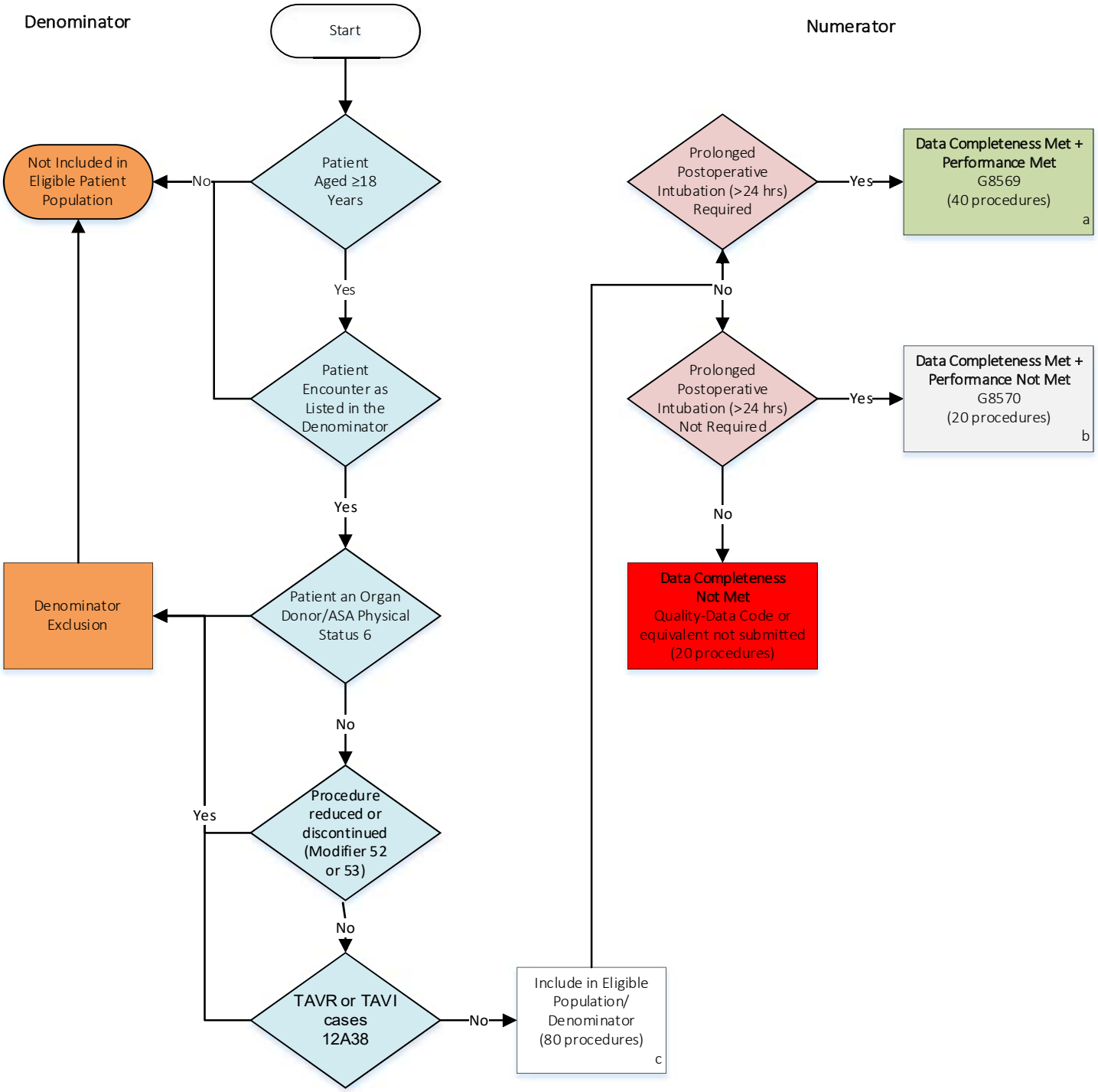
---

[1] *Ji Q, Duan Q, Wang X, et al. Risk factors for ventilator dependency following coronary artery bypass grafting. Int J Med Sci. 2012;9(4):306-310. doi:10.7150/ijms.4340.*

[2] *Totonchi Z, Baazm F, Chitsazan M, Seifi S, Chitsazan M. Predictors of prolonged mechanical ventilation after open heart surgery. J Cardiovasc Thorac Res. 2014;6(4):211-216. doi:10.15171/jcvtr.2014.014.*

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 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 4.0
Updated January 2026

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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 within 60 days of receipt of the survey.

NOTE: *The measure requires that a valid survey, as defined in the numerator of AQI48a, be sent to patients between discharge from the facility and within 30 days of facility discharge. To report AQI48b, a minimum number of 20 surveys, as described in the numerator of AQI48a, 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 within 60 days of receipt. 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 anesthesiology 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.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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
Telehealth Reporting Option:	No

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

AQI48a

Description-AQI48a

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

Denominator-AQI48a

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

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

Denominator Criteria (Eligible Cases):

Patient aged 18 years or older on date of encounter

AND

AQI48a: 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, 00670, 00700, 00702, 00730, 00731, 00732, 00750, 00752, 00754, 00756, 00770, 00790, 00792, 00794, 00796, 00797, 00800, 00802, 00811, 00812, 00813, 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, 01112, 01120, 01130, 01140, 01150, 01160, 01170, 01173, 01200, 01202, 01210, 01212, 01214, 01215, 01220, 01230, 01232, 01234, 01250, 01260, 01270, 01272, 01274, 01320, 01340, 01360, 01380, 01382, 01390, 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, 01937, 01938, 01939, 01940, 01941, 01942, 01951, 01952, 01958, 01960, 01961, 01962, 01963, 01965, 01966, 01967, 01991, 01992, 20526, 20550, 20551, 20552, 20553, 20600, 20604, 20605, 20606, 20610, 20611, 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, 62361, 62362, 62365, 62370, 63650, 63661, 63662, 63663, 63664, 63685, 63688, 64400, 64405, 64408, 64415, 64416, 64417, 64418, 64420, 64425, 64430, 64435, 64445, 64446, 64447, 64448, 64449, 64450, 64451, 64454, 64461, 64463, 64466, 64467, 64468, 64469, 64473, 64474, 64479, 64483, 64486, 64487, 64488, 64489, 64490, 64493, 64505, 64510, 64517, 64520, 64530, 64600, 64605, 64610, 64620, 64624, 64625, 64630, 64633, 64635, 64640, 64680, 64681, 93503, 95990, 95991

Denominator Exclusions-AQI48a

- Organ Donors as designated with ASA Physical Status 6
- Patient died within 30 days of the procedure: **10A11**

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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. Preoperative Education and Preparation
2. Patient and/or Family Communication
3. Care Team Response to Comfort and Well-Being
4. Postoperative 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. Preoperative 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. Postoperative 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) 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

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

OR

11A93 The patient did not respond within 60 days of receipt of the survey. *

*The intent of this registry code is to eliminate the surveys that were not returned within the required 60-day period. Reporting this code is essential for the data completeness calculation and does not indicate negative performance of this measure. Performance is calculated based on performance of AQI48b.

AQI48b

Description-AQI48b

Percentage of patients who complete the survey from AQI48a on their patient experience and satisfaction with anesthesia care and report a positive experience within 60 days of the receipt of the survey.

Denominator-AQI48b

All patients from the numerator of AQI48a who complete a survey on their patient experience and satisfaction with anesthesia care within 60 days of the receipt of the survey.

Denominator Note: In order to report AQI48b, 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 within 60 days of receipt of the survey: **11A94**

Denominator Exclusions-AQI48b

Patient did not complete the mandatory anesthesia satisfaction question within 60 days of receipt of the survey: **11A95**

Numerator – AQI48b:

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: AQI48b

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)

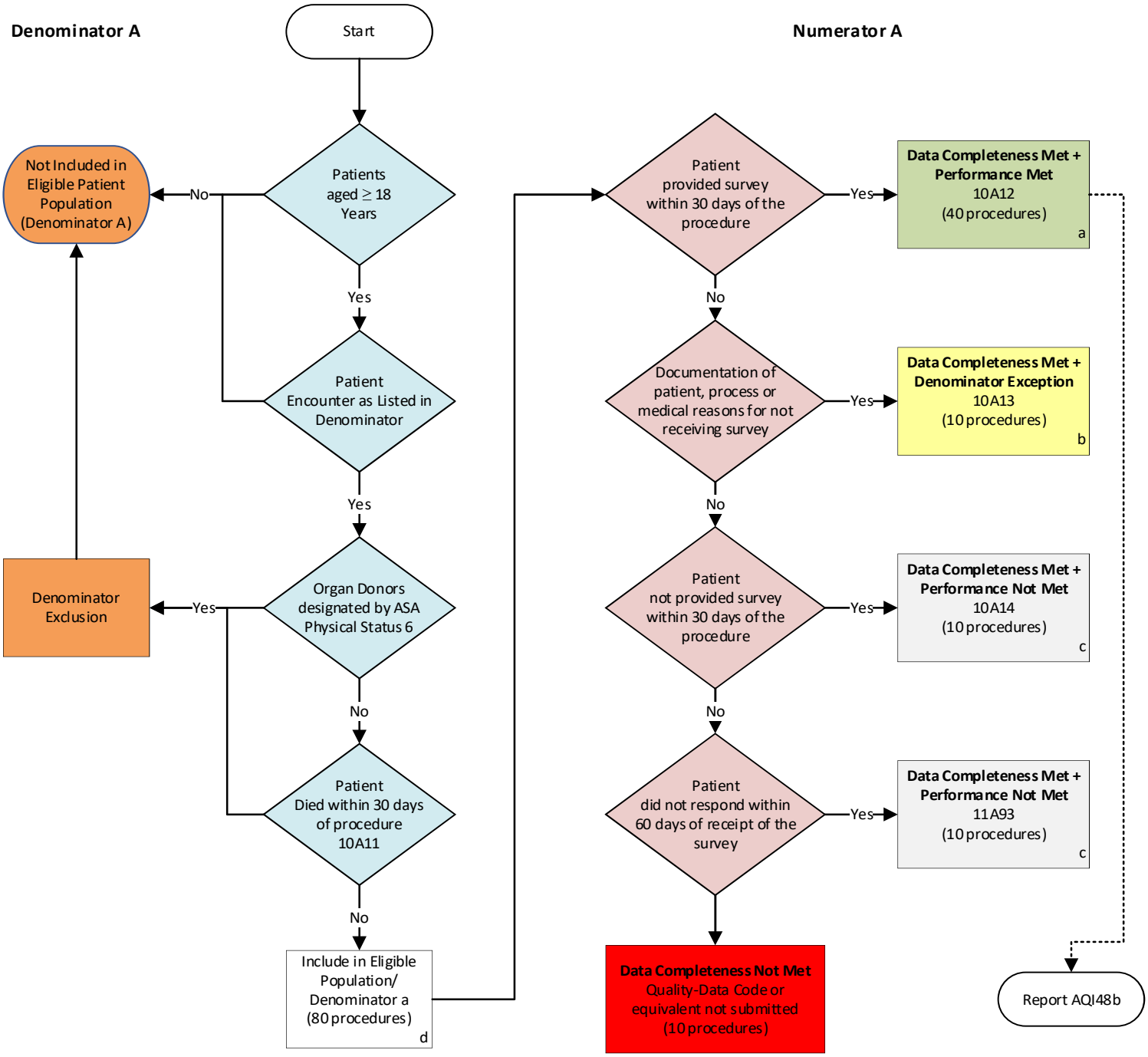
OR

Performance Not Met:

10A71 Patient did NOT report a positive anesthesia experience (i.e., a 1, 2, or 3 on the mandatory survey question)

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #48a: Patient-Reported Experience with Anesthesia



SAMPLE CALCULATIONS:

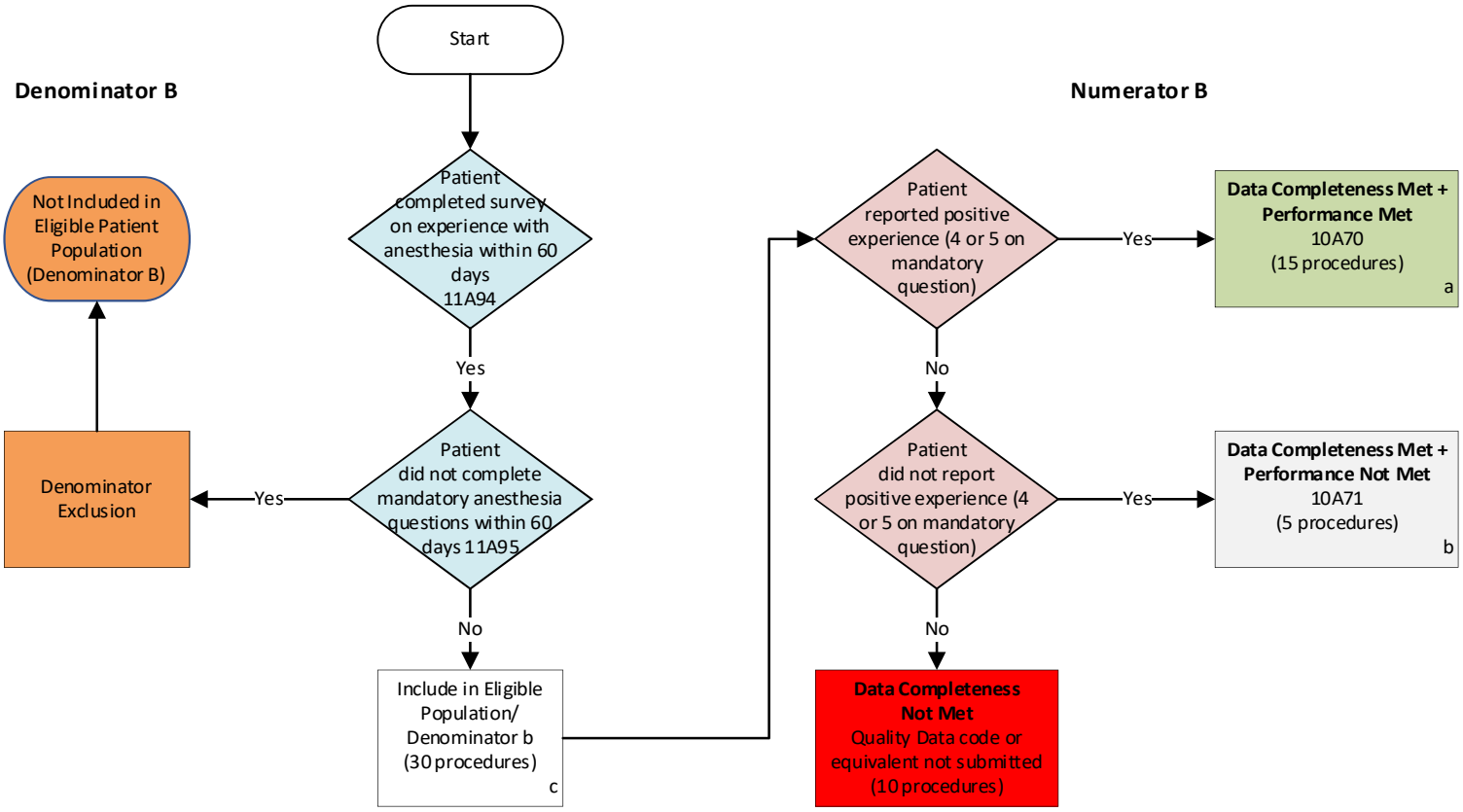
Data Completeness =
Performance Met (a=40 procedures) + Denominator Exception (b=10 procedures) + Performance Not Met (c=20 procedures) = 70 procedures = 87.50%
Eligible Population / Denominator (d=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=40 procedures) = 40 procedures = 66.67%
Data Completeness Numerator (70 procedures) – Denominator Exception (b=10 procedures) = 60 procedures

Version 4.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #48b: Patient-Reported Experience with Anesthesia



SAMPLE CALCULATIONS:

Data Completeness =
Performance Met (a=15 procedures) + Performance Not Met (b=5 procedures) = 20 procedures = 66.67%
Eligible Population / Denominator (d=80 procedures) = 30 procedures

Performance Rate =
Performance Met (a=15 procedures) = 15 procedures = 75.00%
Data Completeness Numerator (20 procedures) = 20 procedures

Version 4.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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

- Procedure reduced or discontinued prior to initiation of CPB as indicated on the claim by Modifier 52 or Modifier 53.
- Transcatheter aortic valve replacement (TAVR) or transcatheter aortic valve implantation (TAVI) cases (CPT codes 33361, 33362, 33363, 33364, 33365, 33366, 33367, 33368, 33369, 93355): **12A38**

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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/ASECT Guidelines on Temperature Management During Cardiopulmonary Bypass[14]

"Surgical teams should limit arterial outlet blood temperature to <37° C 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
Telehealth Reporting Option:	No
Care Setting:	Hospital Inpatient
Telehealth Reporting Option:	No

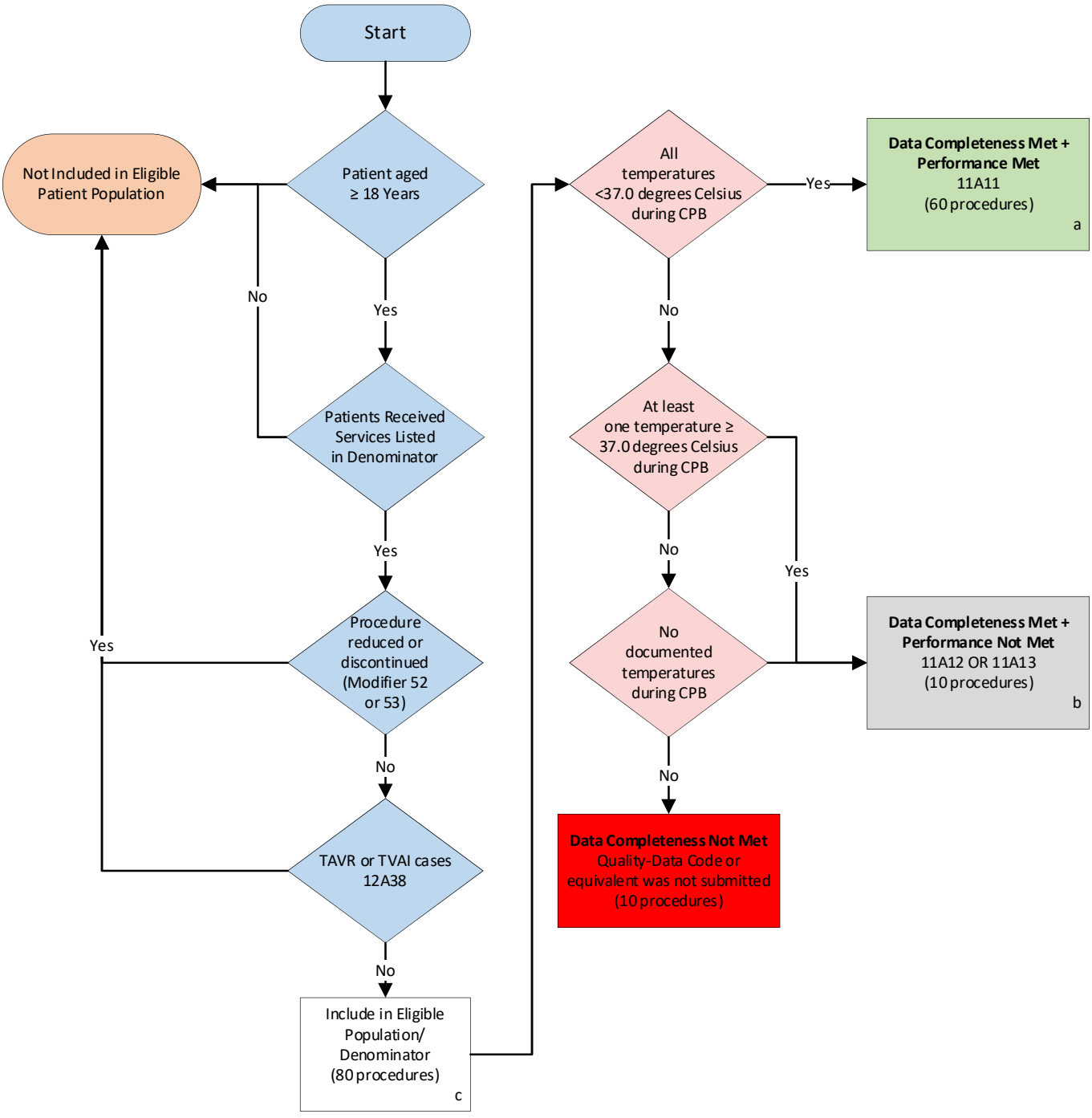
T[14] Engelman R, Baker RA, Likosky DS, et al. The Society of Thoracic Surgeons, The Society of Cardiovascular Anesthesiologists, and The American Society of ExtraCorporeal Technology: Clinical Practice Guidelines for Cardiopulmonary Bypass--Temperature Management during Cardiopulmonary Bypass. J Extra Corpor Technol. 2015;47(3):145-154.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Quality Clinical Data Registry Measure Flow for AQI ID #65: Avoidance of Cerebral Hyperthermia for Procedures Involving Cardiopulmonary Bypass (CPB)

Denominator

Numerator



SAMPLE CALCULATIONS

Data Completeness =
Performance Met (a=60 procedures) + Performance Not Met (b=10 procedure) = 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 4.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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. 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

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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*[29]**

"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.[30] 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).[31]

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.[32]

The Society of Critical Care Medicine (SCCM) advises treatment to 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 recommend maintaining serum glucose levels ≤ 180mg/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 mg/dL.[33]

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

Telehealth Reporting Option: No

---

[29] Joshi, GP, et al. "Society for Ambulatory Anesthesia Consensus Statement on Perioperative Blood Glucose Management in Diabetic Patients Undergoing Ambulatory Surgery." Anesthesia & Analgesia. December 2010; Vol 111:6. P. 1378-1387.

[30] Ehrenfeld JM1, Wanderer JP, Terekhov M, Rothman BS, Sandberg WS. A Perioperative Systems Design to Improve Intraoperative Glucose Monitoring Is Associated with a Reduction in Surgical Site Infections in a Diabetic Patient Population. Anesthesiology. 2017 Mar;126(3):431-440.

[31] Duggan, E.W., Carloson, K., & Umpierrez, G.E. (2017). Perioperative hyperglycemia management: An update. Anesthesiology. 126(3):547-560.

[32] American Diabetes Association Professional Practice Committee; 16. Diabetes Care in the Hospital: Standards of Medical Care in Diabetes—2022. Diabetes Care 1 January 2022; 45 (Supplement_1): S244–S253. https://doi.org/10.2337/dc22-S016

[33] Duggan, E.W., Carloson, K., & Umpierrez, G.E. (2017). Perioperative hyperglycemia management: An update. Anesthesiology. 126(3):547-560.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

AQI71a: Ambulatory Point-of-Care GlucoseTesting

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):

All patients, aged 18 years and older

AND

Diagnosis of diabetes mellitus: **11A41**

OR

ICD-10CM code: E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319, E10.3211, E10.3212, E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311, E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412, E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513, E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.37X1, E10.37X2, E10.37X3, E10.37X9, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621, E10.622, E10.628, E10.630, E10.638, E10.641, E10.649, E10.65, E10.69, E10.8, E10.9, E10.A0, E10.A1, E10.A2, E11.00, E11.01, E11.10, E11.11, E11.21, E11.22, E11.29, E11.311, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.37X1, E11.37X2, E11.37X3, E11.37X9, E11.39, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.51, E11.52, E11.59, E11.610, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.641, E11.649, E11.65, E11.69, E11.8, E11.9, E13.00, E13.01, E13.10, E13.11, E13.21, E13.22, E13.29, E13.311, E13.319, E13.3211, E13.3212, E13.3213, E13.3219, E13.3291, E13.3292, E13.3293, E13.3299, E13.3311, E13.3312, E13.3313, E13.3319, E13.3391, E13.3392, E13.3393, E13.3399, E13.3411, E13.3412, E13.3413, E13.3419, E13.3491, E13.3492, E13.3493, E13.3499, E13.3511, E13.3512, E13.3513, E13.3519, E13.3521, E13.3522, E13.3523, E13.3529, E13.3531, E13.3532, E13.3533, E13.3539, E13.3541, E13.3542, E13.3543, E13.3549, E13.3551, E13.3552, E13.3553, E13.3559, E13.3591, E13.3592, E13.3593, E13.3599, E13.36, E13.37X1, E13.37X2, E13.37X3, E13.37X9, E13.39, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.51, E13.52, E13.59, E13.610, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.641, E13.649, E13.65, E13.69, E13.8, E13.9

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, 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, 01924, 01925, 01926, 01930, 01931, 01932, 01933, 01937, 01938, 01939, 01940, 01941, 01942, 01965, 01966, 01991, 01992

Denominator Exclusions:

Procedure <30 minutes duration: **11A45**

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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

ICD-10CM code: E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319, E10.3211, E10.3212, E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311, E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412, E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513, E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.37X1, E10.37X2, E10.37X3, E10.37X9, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621, E10.622, E10.628, E10.630, E10.638, E10.641, E10.649, E10.65, E10.69, E10.8, E10.9, E10.A0, E10.A1, E10.A2, E11.00, E11.01, E11.10, E11.11, E11.21, E11.22, E11.29, E11.311, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.37X1, E11.37X2, E11.37X3, E11.37X9, E11.39, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.51, E11.52, E11.59, E11.610, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.641, E11.649, E11.65, E11.69, E11.8, E11.9, E13.00, E13.01, E13.10, E13.11, E13.21, E13.22, E13.29, E13.311, E13.319, E13.3211, E13.3212, E13.3213, E13.3219, E13.3291, E13.3292, E13.3293, E13.3299, E13.3311, E13.3312, E13.3313, E13.3319, E13.3391, E13.3392, E13.3393, E13.3399, E13.3411, E13.3412, E13.3413, E13.3419, E13.3491, E13.3492, E13.3493, E13.3499, E13.3511, E13.3512, E13.3513, E13.3519, E13.3521, E13.3522, E13.3523, E13.3529, E13.3531, E13.3532, E13.3533, E13.3539, E13.3541, E13.3542, E13.3543, E13.3549, E13.3551, E13.3552, E13.3553, E13.3559, E13.3591, E13.3592, E13.3593, E13.3599, E13.36, E13.37X1, E13.37X2, E13.37X3, E13.37X9, E13.39, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.51, E13.52, E13.59, E13.610, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.641, E13.649, E13.65, E13.69, E13.8, E13.9

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, 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,

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

01760, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01924, 01925, 01926, 01930, 01931, 01932, 01933, 01937, 01938, 01939, 01940, 01941, 01942, 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

Denominator Exception:

11A82 Documentation that insulin was not given because patient had severe comorbidities and glucose concentrations between 180 mg/dL and 250 mg/dL (10-13.9 mmol/L).[33]

OR

Performance Not Met:

11A54 Patient did NOT receive insulin prior to anesthesia end time.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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

ICD-10CM code: E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319, E10.3211, E10.3212, E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311, E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412, E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513, E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.37X1, E10.37X2, E10.37X3, E10.37X9, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621, E10.622, E10.628, E10.630, E10.638, E10.641, E10.649, E10.65, E10.69, E10.8, E10.9, E10.A0, E10.A1, E10.A2, E11.00, E11.01, E11.10, E11.11, E11.21, E11.22, E11.29, E11.311, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.37X1, E11.37X2, E11.37X3, E11.37X9, E11.39, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.51, E11.52, E11.59, E11.610, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.641, E11.649, E11.65, E11.69, E11.8, E11.9, E13.00, E13.01, E13.10, E13.11, E13.21, E13.22, E13.29, E13.311, E13.319, E13.3211, E13.3212, E13.3213, E13.3219, E13.3291, E13.3292, E13.3293, E13.3299, E13.3311, E13.3312, E13.3313, E13.3319, E13.3391, E13.3392, E13.3393, E13.3399, E13.3411, E13.3412, E13.3413, E13.3419, E13.3491, E13.3492, E13.3493, E13.3499, E13.3511, E13.3512, E13.3513, E13.3519, E13.3521, E13.3522, E13.3523, E13.3529, E13.3531, E13.3532, E13.3533, E13.3539, E13.3541, E13.3542, E13.3543, E13.3549, E13.3551, E13.3552, E13.3553, E13.3559, E13.3591, E13.3592, E13.3593, E13.3599, E13.36, E13.37X1, E13.37X2, E13.37X3, E13.37X9, E13.39, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.51, E13.52, E13.59, E13.610, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.641, E13.649, E13.65, E13.69, E13.8, E13.9

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,

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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, 01937, 01938, 01939, 01940, 01941, 01942, 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.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

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

ICD-10CM code: E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319, E10.3211, E10.3212, E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311, E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412, E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513, E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.37X1, E10.37X2, E10.37X3, E10.37X9, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621, E10.622, E10.628, E10.630, E10.638, E10.641, E10.649, E10.65, E10.69, E10.8, E10.9, E10.A0, E10.A1, E10.A2, E11.00, E11.01, E11.10, E11.11, E11.21, E11.22, E11.29, E11.311, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.37X1, E11.37X2, E11.37X3, E11.37X9, E11.39, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.51, E11.52, E11.59, E11.610, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.641, E11.649, E11.65, E11.69, E11.8, E11.9, E13.00, E13.01, E13.10, E13.11, E13.21, E13.22, E13.29, E13.311, E13.319, E13.3211, E13.3212, E13.3213, E13.3219, E13.3291, E13.3292, E13.3293, E13.3299, E13.3311, E13.3312, E13.3313, E13.3319, E13.3391, E13.3392, E13.3393, E13.3399, E13.3411, E13.3412, E13.3413, E13.3419, E13.3491, E13.3492, E13.3493, E13.3499, E13.3511, E13.3512, E13.3513, E13.3519, E13.3521, E13.3522, E13.3523, E13.3529, E13.3531, E13.3532, E13.3533, E13.3539, E13.3541, E13.3542, E13.3543, E13.3549, E13.3551, E13.3552, E13.3553, E13.3559, E13.3591, E13.3592, E13.3593, E13.3599, E13.36, E13.37X1, E13.37X2, E13.37X3, E13.37X9, E13.39, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.51, E13.52, E13.59, E13.610, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.641, E13.649, E13.65, E13.69, E13.8, E13.9

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, 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,

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

01760, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01860, 01916, 01920, 01924, 01925, 01926, 01930, 01931, 01932, 01933 01937, 01938, 01939, 01940, 01941, 01942, 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

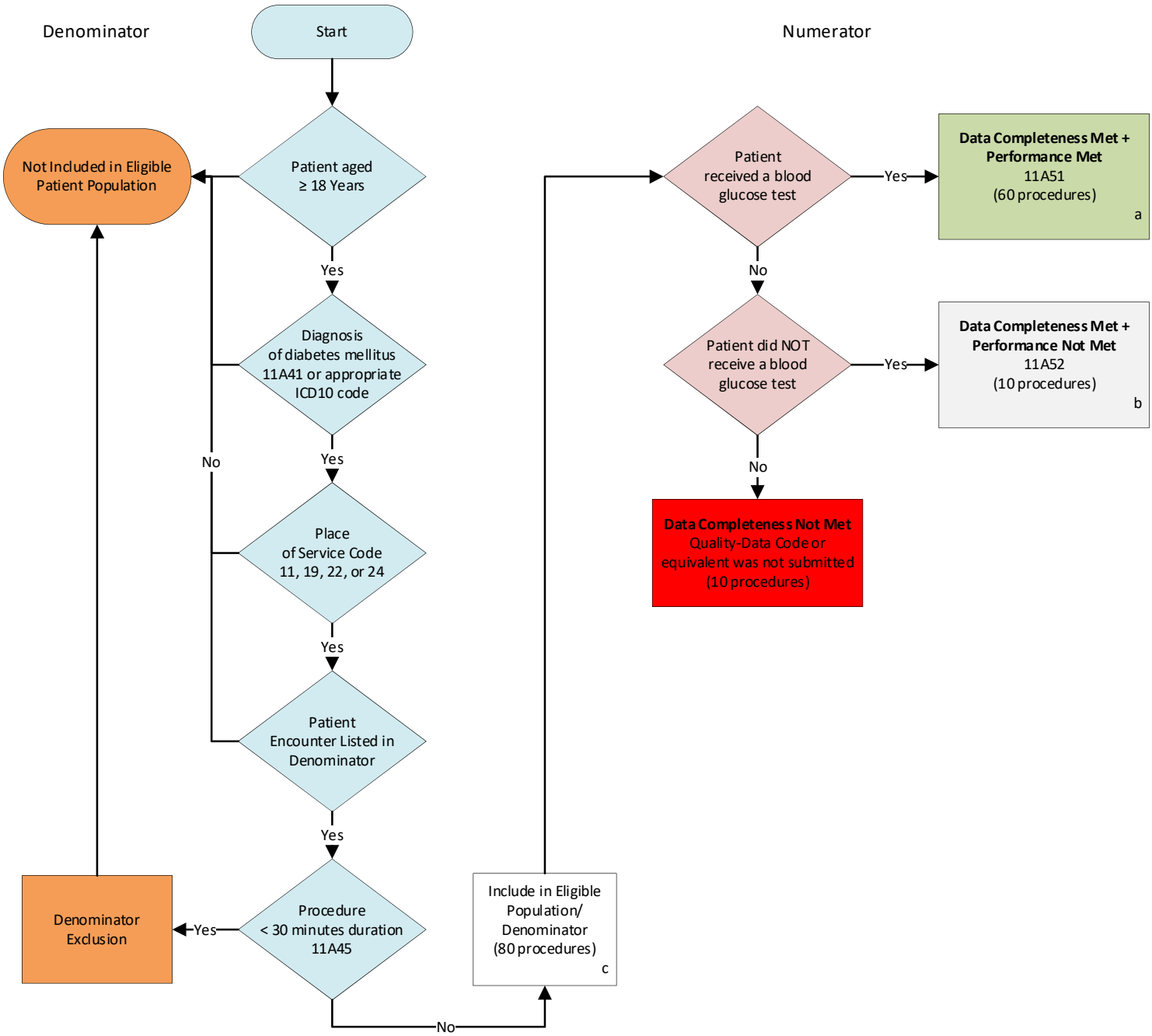
Performance Not Met:

11A59 Patient did NOT receive education on managing their glucose in the postoperative period prior to discharge.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #71a:
Ambulatory Glucose Management:
Ambulatory Point-of-Care Glucose Testing

Multiple Submission Criteria



SAMPLE CALCULATIONS

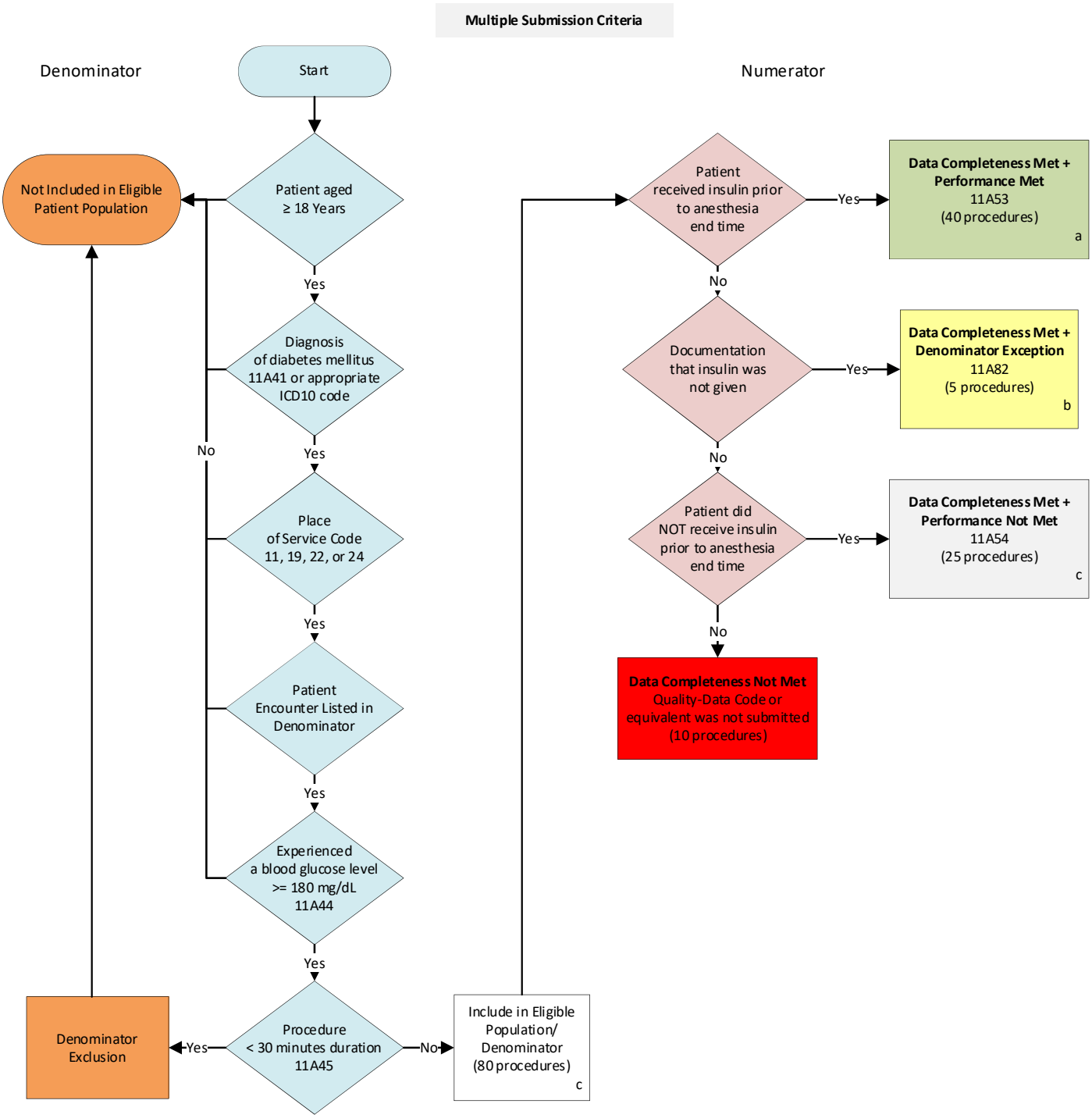
Data Completeness =
Performance Met (a=60 procedures) + Performance Not Met (b=10 procedures) = 70 procedures = 87.50%
Eligible Population / Denominator (c=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=60 procedures) = 60 procedures = 85.71%
Data Completeness Numerator (70 procedures) = 70 procedures

Version 3.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #71b:
Ambulatory Glucose Management:
Ambulatory Hyperglycemia Control



SAMPLE CALCULATIONS

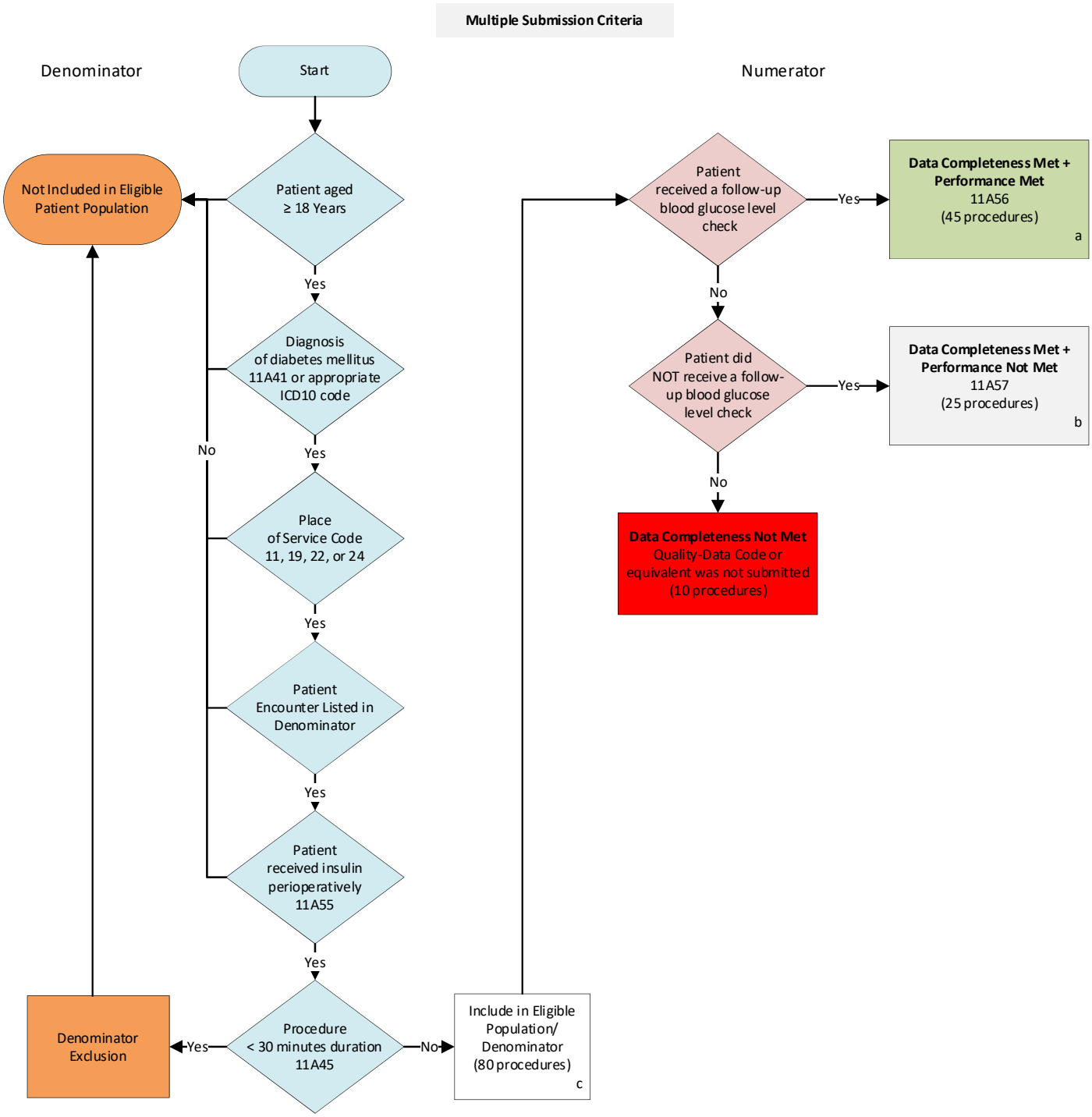
Data Completeness =
Performance Met (a=40 procedures) + Denominator Exceptions (b=5 procedures) + Performance Not Met (c=25 procedure) = 70 procedures = 87.50%
Eligible Population / Denominator (d=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=40 procedures) = 40 procedures = 61.54%
Data Completeness Numerator (70 procedures) – Denominator Exceptions (b=5 procedures) = 65 procedures

Version 3.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #71c:
Ambulatory Glucose Management:
Follow-Up Glucose Check for Patients Receiving Insulin



SAMPLE CALCULATIONS

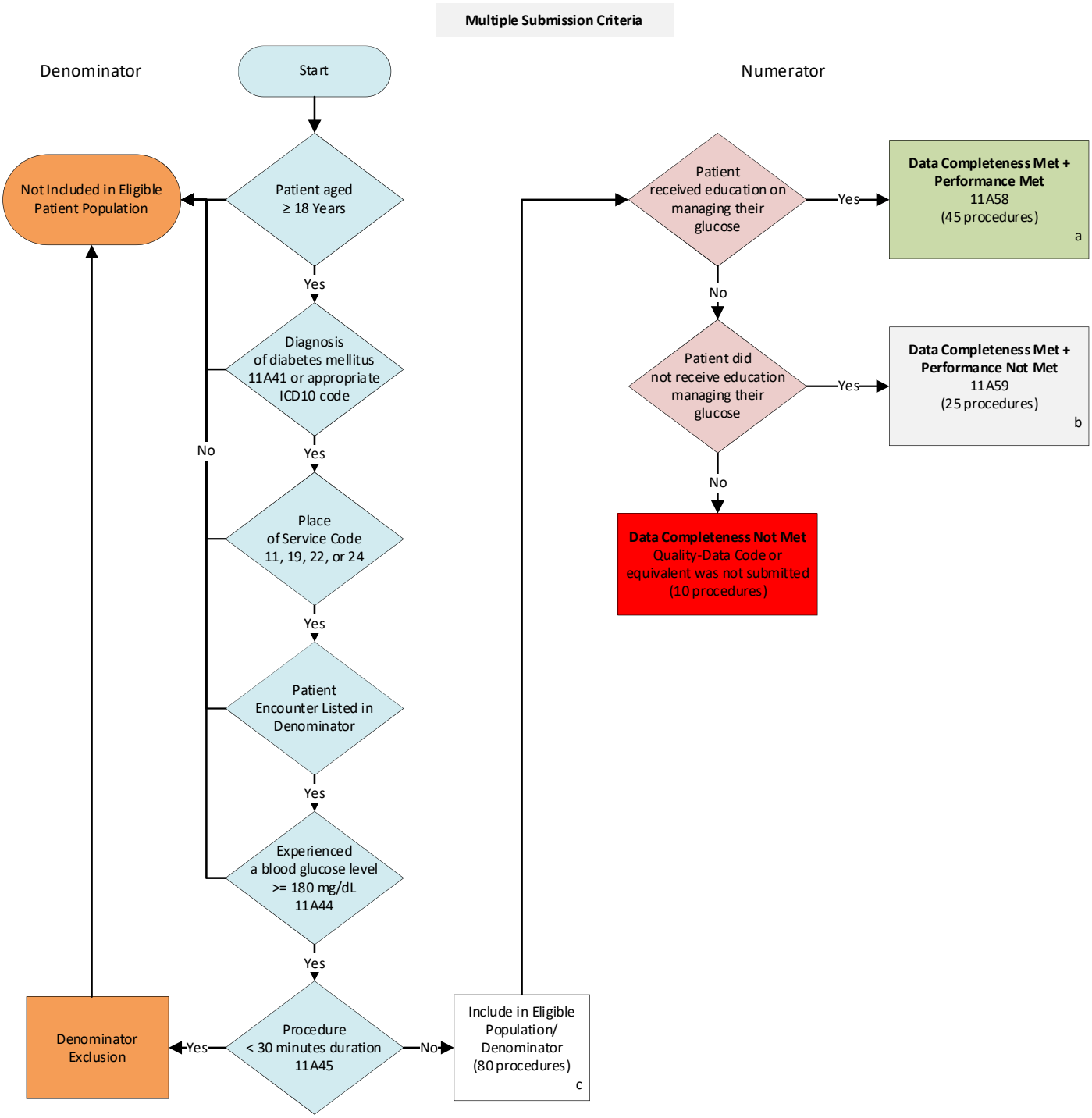
Data Completeness =
Performance Met (a=45 procedures) + Performance Not Met (b=25 procedures) = 70 procedures = 87.50%
Eligible Population / Denominator (c=80 procedures) = 80 procedures

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

Version 3.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #71d:
Ambulatory Glucose Management:
Hyperglycemia Management Patient Education



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

Version 3.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Qualified Clinical Data Registry Measure Flow for AQI ID #71:
Ambulatory Glucose Management:
Sample Overall Calculation

Multiple Submission Criteria

SAMPLE CALCULATIONS: Ambulatory Point-of-Care Glucose Testing

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

SAMPLE CALCULATIONS

Data Completeness =
Performance Met (a=40 procedures) + Denominator Exceptions (b=5 procedures) + Performance Not Met (c=25 procedure) = 70 procedures = 87.50%
Eligible Population / Denominator (d=80 procedures) = 80 procedures

Performance Rate =
Performance Met (a=40 procedures) = 40 procedures = 61.54%
Data Completeness Numerator (70 procedures) – Denominator Exceptions (b=5 procedures) = 65 procedures

SAMPLE CALCULATIONS: Follow-Up Glucose Check for Patients Receiving Insulin

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

SAMPLE CALCULATIONS: Hyperglycemia Management Patient Education

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

SAMPLE CALCULATIONS: Sample Overall Calculation

Performance Rate =
Ambulatory Point-of-Care Glucose Testing Performance Rate (85.71%) + Ambulatory Hyperglycemia Control Performance Rate (61.54%) +
Follow-Up Glucose Check for Patients Receiving Insulin Performance Rate (64.29%) + Hyperglycemia Management Patient Education Performance Rate (64.29%)
4

Performance Rate =
85.71% + 64.29% + 64.29% + 64.29% = 275.83 = 68.96%
4 = 4

Version 3.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

Measure Title

AQI81 Use of Peripheral Nerve Blocks for Pain Management in Hip Fracture Patients

Measure Description:
All patients, aged 65 and older, who are diagnosed with a hip fracture and receive peripheral nerve blocks for pain management in the emergency room or inpatient setting.

NQS Domain/Meaningful Measures Area
Patient Safety

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions:
This measure is to be reported when a patient aged 65 and older, diagnosed with an isolated hip fracture, receives peripheral nerve blocks for pain management in the emergency and/or inpatient settings of the hospital. It is anticipated that qualified anesthesia providers and eligible clinicians who provide care for the denominator-eligible population will submit this measure.

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third-party intermediaries via the Qualified Clinical Data Registry option.

Measure Reporting via the Qualified Clinical Data Registry:
CPT (Current Procedural Terminology) codes, and patient demographics and registry codes are used to identify patients who are included in the measure denominator.

Denominator
Patients, aged 65 and older, with a diagnosis of an isolated hip fracture.

Denominator Criteria (Eligible Cases):
All patients aged 65 and older
AND
Diagnosis of isolated hip fracture: **12A41**
AND
Patient encounter during the reporting period (CPT):
64450, 64447, 64448, 64449, 62323, 64474
AND
Place of service code: 21, 23

Denominator Exclusions
Emergent Cases: **M1142**
Multiple surgical procedures: **12A42**

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

Numerator
Patient received peripheral nerve blocks for pain management in the emergency room and/or inpatient setting.

Numerator Note: For the purposes of this measure, the numerator is met if a peripheral nerve block via a single injection and/or catheter is administered for pain management during the hospital care episode.

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:

12A43	Peripheral nerve block was used for pain management

OR

Denominator Exception:

12A44	Documentation of patient reason(s), process reason(s) or medical reason(s) for not receiving peripheral nerve block (i.e., medical contraindication, patient has allergy to local anesthetics, patient has coagulopathy or ongoing anticoagulation without appropriate reversal, infection at the PNB insertion site, patient refusal), or an anesthesiologist was not consulted.

OR

Performance Not Met:

12A45	Peripheral nerve block was NOT used for pain management

Rationale
Hip fractures, particularly in older adults, are associated with significant pain, high morbidity, and increased risk of complications such as delirium, pneumonia, and prolonged immobility. Effective pain control is essential not only for patient comfort but also for enabling early mobilization and surgical intervention. Peripheral nerve blocks, including fascia iliaca compartment block, femoral nerve block, and pericapsular nerve block, offer a targeted, opioid-sparing approach to pain management. These blocks anesthetize the sensory nerves supplying the anterior hip capsule, which is the primary source of pain in hip fractures.

Quote Verbatim:

"Although use of peripheral nerve blocks for pain control after hip fracture has increased over time, fewer than 5 of every 100 patients hospitalized with hip fracture currently receive a peripheral nerve block, suggesting possible underuse. J Am Geriatr Soc 68:835-840, 2020."

Clinical Recommendation Statements

Recent guidelines recommend the performance of Peripheral Nerve Blocks (PNBs) as part of multimodal analgesia for patients with hip fractures. Ideally the block should be performed in the emergency department or preoperative setting and should not be delayed based on anticipated time of surgery.

PNBs such as the fascia iliaca compartment block (FICB), femoral nerve block, or pericapsular nerve group (PENG) block, are recommended as part of the multimodal analgesia protocol for patients aged 65 years and older presenting with hip fractures in the hospital setting. This recommendation is supported by published literature and published guidelines endorsed by orthopedic and Anesthesiology Societies.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

References:

Dangle, J., Kukreja, P., & Kalagara, H. (2020). *Review of Current Practices of Peripheral Nerve Blocks for Hip Fracture and Surgery*. *Current Anesthesiology Reports, 10*, 259–266. https://link.springer.com/article/10.1007/s40140-020-00393-7

Guay J, Kopp S. Peripheral nerve blocks for hip fractures in adults. Cochrane Database Syst Rev. 2020 Nov 25;11(11):CD001159. doi: 10.1002/14651858.CD001159.pub3. PMID: 33238043; PMCID: PMC8130997.

Lee, C.-Y. M., Apicella, M., & Farrow, R. (2021). *The Pericapsular Nerve Group (PENG) Block for Hip Pain*. Emergency Medicine Residents' Association (EMRA). https://www.emra.org/emresident/article/peng-block/

Irish Association for Emergency Medicine (IAEM). (2023). *Peri-capsular Nerve Group (PENG) Block for the Management of Neck of Femur Fractures – Clinical Guideline V1.0*. https://iaem.ie/wp-content/uploads/2023/06/PENG-Block-Guideline-V1.0.pdf

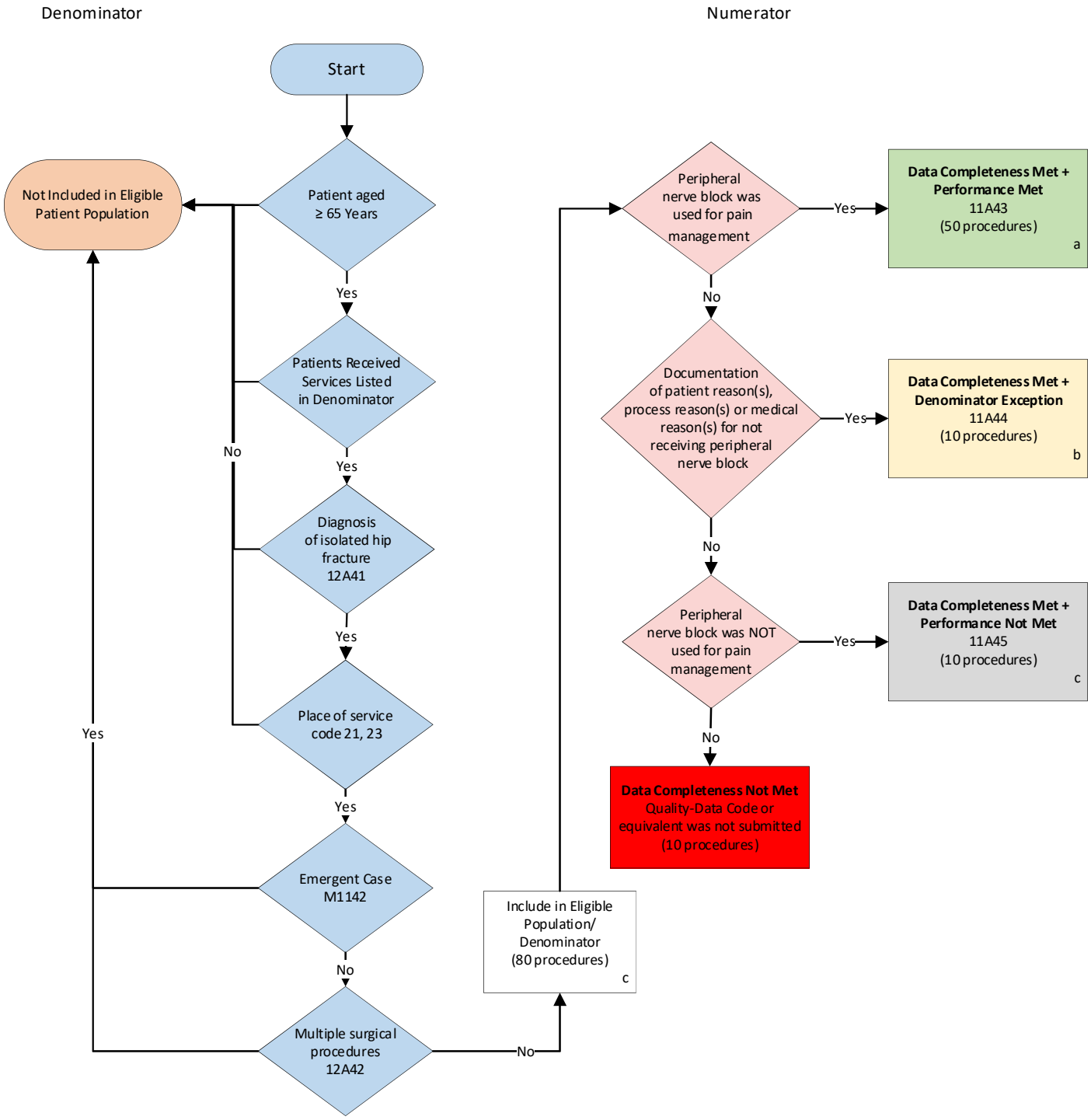
O'Connor MI, Switzer JA. AAOS Clinical Practice Guideline Summary: Management of Hip Fractures in Older Adults. J Am Acad Orthop Surg. 2022 Oct 15;30(20):e1291-e1296. doi: 10.5435/JAAOS-D-22-00125. Epub 2022 Jun 17. PMID: 36200817.

Neuman MD, Elkassabany NM, Ochroch J, Newcomb C, Brensinger C, Mehta S, Gaskins LJ, Lane-Fall MB. Nerve Block Use after Hip Fracture Versus Elective Hip or Knee Arthroplasty: Retrospective Analysis. J Am Geriatr. Soc. 2020 Apr;68(4):835-840. doi: 10.1111/jgs.16362. Epub 2020 Mar 3. PMID: 32124973.

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
Telehealth Reporting Option:	No

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Quality Clinical Data Registry Measure Flow for AQI ID #81: Use of Peripheral Nerve Blocks for Pain Management in Hip Fracture Patients



SAMPLE CALCULATIONS

Data Completeness =
Performance Met (a=50 procedures) + Denominator Exceptions (b=10) + Performance Not Met (c=10 procedure) = 70 procedures = 87.50%
Eligible Population / Denominator (c=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 1.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

Measure Title

AQI82 Intraoperative Antibiotic Redosing in Open Cardiac Surgeries

Measure Description:
Percentage of patients who undergo an open cardiac procedure over 240 minutes duration and who receive initial cephalosporin or clindamycin administration within 60 minutes before surgical incision and receive either a bolus infusion or an intravenous cephalosporin antibiotic re-dose at four-hour intervals.

NQS Domain/Meaningful Measures Area
Patient Safety

Measure Type
Process

High Priority Status
Yes

Inverse Measure
No

Instructions:
This measure is to be reported each time a patient undergoes an open cardiac surgical procedure for over 240 minutes (4 hours) during the reporting period. The measure time commences 60 to 120 minutes before surgical incision during which the patient receives their initial antibiotic dose. It is anticipated that qualified anesthesia professionals and eligible clinicians who provide denominator-eligible services will submit this measure.

Measure Submission Type:
Measure data may be submitted by individual MIPS-eligible clinicians, groups, or third-party intermediaries via the Qualified Clinical Data Registry option.

Measure Reporting via the Qualified Clinical Data Registry:
CPT (Current Procedural Terminology) codes, denominator criteria, registry codes, and patient demographics are used to identify patients who are included in the measure denominator. The numerator options included in this specification are used to submit the quality actions as allowed by the measure.

Denominator
All patients who undergo an open cardiac procedure over 240 minutes (4 hours) duration.

Denominator Criteria (Eligible Cases):
All patients
AND
Procedure greater than 240 minutes (4 hours) duration: **12A02**
AND
Patient encounter during the reporting period (CPT):
00560, 00561, 00562, 00563, 00566, 00567, 00580

Denominator Exclusions
Non-cardiac, transcatheter/endovascular, electrophysiology/catheterization, and other cardiac cases (determined by the procedure type). **12A03**

- Non-cardiac: 44950, 44955,44960, 47562, 47563, 47564, 27447, 61510, 42820, 42821, 42825, 42826, 55866, 58150, 58260–58294, 8541–58573.
- Transcatheter/Endovascular: 37220, 37221, 37224, 37226, 34802, 37184, 37187.
- Electrophysiology/Catheterization: 93619, 93620, 93621, 93622, 93653, 93654, 93656, 93657, 93609.

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

- Other Cardiac Cases: 35301, 35302, 365555, 36557, 365558, 36560, 36555, 36561, 36568, 36569, 36572, 36573, 36556, 36555, 36557, 36558, 36560, 36561, 36568, 36569, 36572, 36620,37221, 3724, 37226, 37228, 92920, 92928, 92928, 34001, 34101, 34111, 34201, 34203, 37184, 37185, 37186, 37187.
- Chronic kidney disease. N18.1, N18.2, N18.3, N18.30, N18.31, N.18.32, N18.4, N 18.5, N18.6, N18.22, E11.22, I12.x, I13.x, Z99.2.

Numerator
Patients who receive administration of initial cephalosporin antibiotic prophylaxis within 60 minutes before surgical incision and either bolus infusion or intravenous redosing of their cephalosporin within four hours of initial cephalosporin antibiotic prophylaxis.

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:

12A46	Patients received administration of initial cephalosporin antibiotic prophylaxis within 60 minutes before surgical incision administration and received either bolus infusion or intravenous redosing cephalosporin within 240 minutes (4 hours) of initial cephalosporin antibiotic prophylaxis or bolus infusion.

OR

Denominator Exception:

12A47	Documentation of patient reason(s) for not receiving antibiotic redosing (i.e., medical contraindication; patient already received scheduled antibiotics).

OR

Performance Not Met:

12A48	Patients did NOT receive administration of initial cephalosporin antibiotic prophylaxis within 60 minutes before surgical incision and/or did not receive administration of a bolus infusion or intravenous redosing of their cephalosporin within 240 minutes (4 hours) of initial cephalosporin antibiotic prophylaxis.

Rationale
Appropriate antibiotic redosing during prolonged cardiac surgeries is crucial to maintain effective antibiotic concentrations and prevent surgical site infections, which can lead to increased morbidity, mortality, and healthcare costs.

Surgical site infections are associated with significant morbidity and mortality and severe complications for cardiac surgery patients including prolonged hospital stays, increased need for intensive care, and higher in-hospital mortality rates.

Performance gaps persist in open cardiac surgical procedures. Studies have shown variability in adherence to redosing protocols, which can impact the effectiveness of infection protection. To reduce surgical site infections, it is recommended that initial and subsequent antibiotic redosing be done in open cardiac procedures of greater than two hours duration.

According to Bardia, et al, in a study “with the objective to measure the association among the 4 components of Society of Thoracic Surgeons antibiotic guidelines and postoperative complications in a cohort of patients undergoing valve or coronary artery bypass grafting requiring cardiopulmonary bypass, nonadherence to Society of Thoracic Surgeons antibiotic best practices is common. Failure of antibiotic timing and weight-adjusted dosing is associated with odds of postoperative infection, sepsis, and mortality after cardiac surgery.” Furthermore, the authors found after the intervention that “more than one-third of surgical encounters remained discordant with Infectious Diseases Society of America recommendations.” The

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

researchers argued that “Future quality improvement efforts targeting gaps in practice in relation to guidelines may lead to improved adherence and possibly decreased SSIs.”

Considering these gaps in antibiotic redosing in cardiac surgeries, it is imperative to measure and improve upon antibiotic redosing in cardiac surgeries to reduce the risk of surgical site infections, reduce cost, and improve patient outcomes.

Clinical Recommendation Statements

The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic Prophylaxis in Cardiac Surgery, Part II: Antibiotic Choice* Richard Engelman, MD, David Shahian, MD, Richard Shemin, MD, T. Sloane Guy, MD, Dale Bratzler, DO, MPH, Fred Edwards, MD, Marshall Jacobs, MD, Hiran Fernando, MD, and Charles Bridges, MD, ScD Baystate Medical Center, Springfield, Massachusetts; Tufts University School of Medicine, Boston, Massachusetts; Boston Medical Center, Boston, Massachusetts; University of California, San Francisco, California; Oklahoma Foundation for Medical Quality, Oklahoma City, Oklahoma; University of Florida, Shands Jacksonville, Jacksonville, Florida; St. Christopher’s Hospital for Children, Philadelphia, Pennsylvania; and University of Pennsylvania Medical Center, Philadelphia, Pennsylvania

Quote Verbatim:

“The duration of a prophylactic antibiotic regimen is directly related to the probability of developing resistant microorganisms. OPTIMAL PRACTICE. The duration of a prophylactic antibiotic regimen is limited to the shortest amount of time required to effectively minimize the probability of postoperative infection.”

The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic Prophylaxis in Cardiac Surgery, Part II: Antibiotic Choice* Richard Engelman, MD, David Shahian, MD, Richard Shemin, MD, T. Sloane Guy, MD, Dale Bratzler, DO, MPH, Fred Edwards, MD, Marshall Jacobs, MD, Hiran Fernando, MD, and Charles Bridges, MD, ScD Baystate Medical Center, Springfield, Massachusetts; Tufts University School of Medicine, Boston, Massachusetts; Boston Medical Center, Boston, Massachusetts; University of California, San Francisco, California; Oklahoma Foundation for Medical Quality, Oklahoma City, Oklahoma; University of Florida, Shands Jacksonville, Jacksonville, Florida; St. Christopher’s Hospital for Children, Philadelphia, Pennsylvania; and University of Pennsylvania Medical Center, Philadelphia, Pennsylvania

Quote Verbatim:

“CLASS IIA RECOMMENDATION. Based on availability and cost, it is reasonable to use cefazolin (a first-generation agent) as the cephalosporin for standard cardiac surgical prophylaxis in view of the fact that most randomized trials could not discriminate between cephalosporins (Level of Evidence B).

Quote Verbatim:

“In patients for whom cefazolin is the appropriate prophylactic antibiotic for cardiac surgery, administration within 60 minutes of the skin incision is indicated (Class I, Level of Evidence A). The pre-operative prophylactic dose of cefazolin for a patient of greater than 60 kg body weight is recommended to be 2 g (Class I, Level of Evidence B).”

Quote Verbatim:

“When the surgical incision remains open in the operating room, to patients with normal renal function, a second dose of 1 g should be administered every 3 to 4 hours. If it is apparent that cardiopulmonary bypass will be discontinued within 4 hours, it is appropriate to delay until perfusion is complete to maximize effective blood levels (Class I, Level of Evidence B)”

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

References:

Abdul-Rahman, Toufik MBBSa; Ekerin, Olabode MBBSb; Lukman, Lawal MBBSc; Colescu, Alice MBBSd; Ede-Imafidon, Deba BSe; Wireko, Andrew Awuah MBBSa; Abid, Muhammad Shuaib MBBSf. Antibiotic prophylaxis in cardiac surgery: challenges and future perspectives. International Journal of Surgery: Global Health 6(5):e0237, September 2023. | DOI: 10.1097/GH9.0000000000000237.

Bardia A, Michel G, Farela A, Fisher C, Mori M, Huttler J, Lang AL, Geirsson A, Schonberger RB. Association of adherence to individual components of Society of Thoracic Surgeons cardiac surgery antibiotic guidelines and postoperative infections. J Thorac Cardiovasc Surg. 2023 Apr 17:S0022-5223(23)00325-2. doi: 10.1016/j.jtcvs.2023.03.031. Epub ahead of print. PMID: 37075942; PMCID: PMC10579454.

Bardia A, Treggiari MM, Michel G, Dai F, Tickoo M, Wai M, Schuster K, Mathis M, Shah N, Kheterpal S, Schonberger RB. Adherence to Guidelines for the Administration of Intraoperative Antibiotics in a Nationwide US Sample. JAMA Netw Open. 2021 Dec 1;4(12): e2137296. doi: 10.1001/jamanetworkopen.2021.37296. PMID: 34905007; PMCID: PMC8672234.

Edwards FH, Engelman RM, Houck P, Shahian DM, Bridges CR; Society of Thoracic Surgeons. The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic Prophylaxis in Cardiac Surgery, Part I: Duration. Ann Thorac Surg. 2006 Jan;81(1):397-404. doi: 10.1016/j.athoracsur.2005.06.034. PMID: 16368422.

Engelman R, Shahian D, Shemin R, Guy TS, Bratzler D, Edwards F, Jacobs M, Fernando H, Bridges C; Workforce on Evidence-Based Medicine, Society of Thoracic Surgeons. The Society of Thoracic Surgeons practice guideline series: Antibiotic prophylaxis in cardiac surgery, part II: Antibiotic choice. Ann Thorac Surg. 2007 Apr;83(4):1569-76. doi: 10.1016/j.athoracsur.2006.09.046. PMID: 17383396.

Karapetyan, Kristina, et al. "Overview of Antibiotic Prophylaxis in Orthopaedic and Cardiac Procedures." Orthopaedic Nursing 42.5 (2023): 312-316.

Mirasi NS, Dianatkhah M, Hosseiny A, Soltani R, Keshavarz A, Boroumandpour S. Evaluation of the Adherence to the Antimicrobial Prophylaxis Guidelines before Cardiac Surgeries in a Specialized University Hospital: A Unicenter Cross-Sectional Study from Iran. J Pharm Care. 2023;11(4):214-218.

O'Sullivan, Cormac T., et al. "Implementation of a multifaceted program to sustainably improve appropriate intraoperative antibiotic redosing." American journal of infection control 47.1 (2019): 74-77.

Additional Evidence for Gaps in Care:

Intraoperative Antibiotic Redosing Gap in Care and Cost Data Gaps in Care and Information on Surgical Site Infection Costs

1. The CDC 2024 Stewardship Update noted that hospitals with lower intraoperative antibiotic redosing adherence had higher post-operative antibiotic prescribing rates suggesting a reactive treatment of infections vs. prevention.
2. Seidelman JL, Mantyh CR, Anderson DJ. Surgical Site Infection Prevention: A Review. JAMA. 2023;329(3):244–252. doi:10.1001/jama.2022.24075

   Approximately 0.5% to 3% of patients undergoing surgery will experience infection at or adjacent to the surgical incision site. Compared with patients undergoing surgery who do not have a surgical site infection, those with a surgical site infection are hospitalized approximately 7 to 11 days longer.
3. Seidelman JL, Mantyh CR, Anderson DJ. Surgical Site Infection Prevention: A Review. JAMA. 2023;329(3):244–252. doi:10.1001/jama.2022.24075
4. Surgical site infections are associated with increased morbidity and mortality, higher readmission rates, and greater healthcare costs.
5. The 2023 NHSN HAI Progress Report noted a 2% increase in the standardized infection ratio (SIR) for SSIs across all NHSN procedure categories compared to 2022. This includes cardiac surgeries, which remain among the highest-risk categories for deep and organ/space SSIs according to this study.

MPOG (Multicenter Perioperative Outcomes Group is developing data on quality improvement gaps in antibiotic

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

redosing in open cardiac procedures because they are aware of gaps in redosing in the perioperative period. We hope to be able to share this gap information with our measure submission for MIPS 2026.

6. Branch-Elliman W, O'Brien W, Strymish J, Itani K, Wyatt C, Gupta K. Association of Duration and Type of Surgical Prophylaxis With Antimicrobial-Associated Adverse Events. JAMA Surg. 2019;154(7):590–598. doi:10.1001/jamasurg.2019.0569

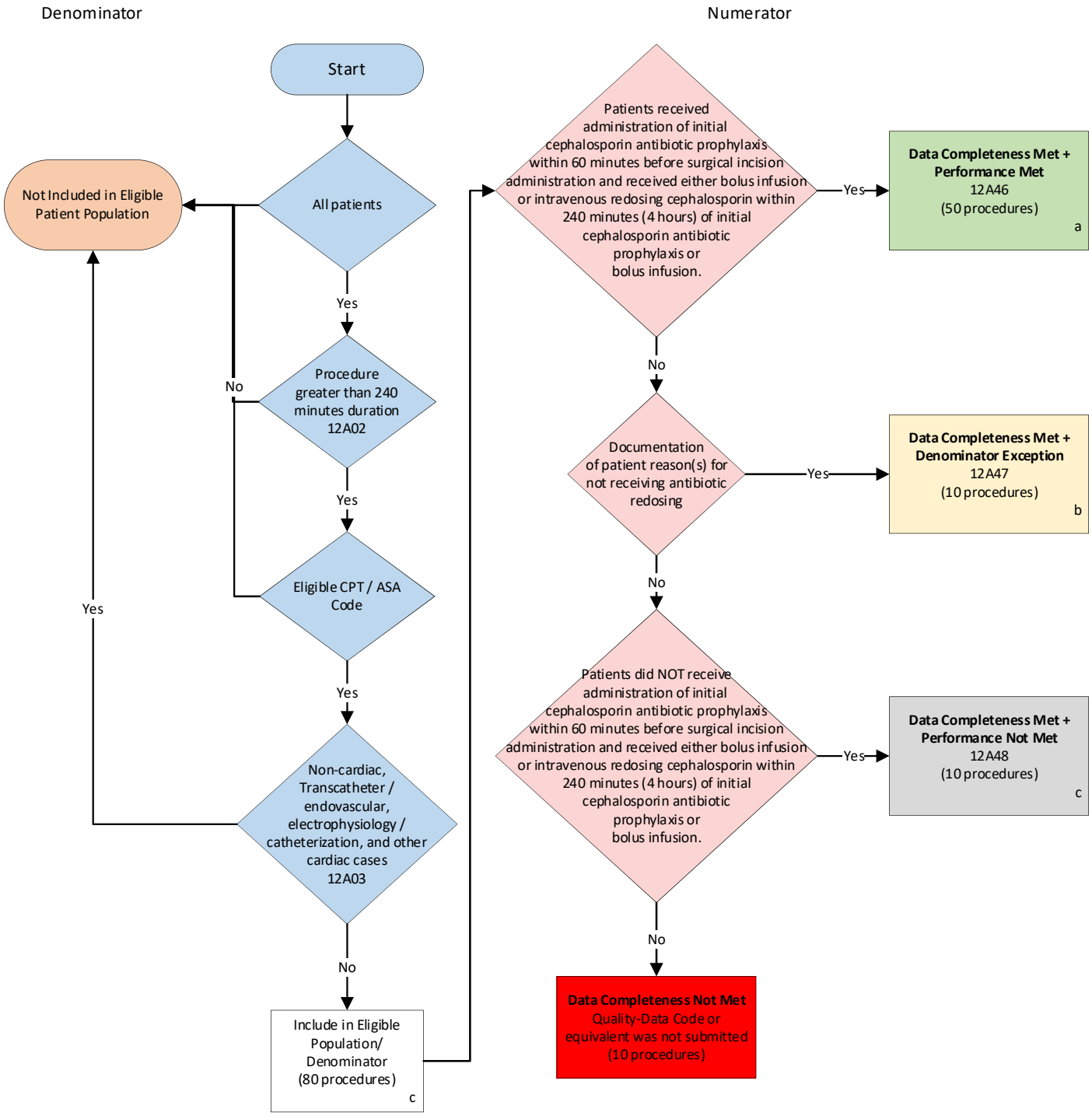
   According to a large-scale study published in JAMA Surgery and CDC reports, 73.2% received timely intraoperative antibiotic redosing, which means 26.8% of eligible patients did not receive redosing within the recommended time frame.

   This gap in care is particularly concerning in cardiac surgeries where prolonged operative times increase the risk for surgical site infections.

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
Telehealth Reporting Option:	No

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

2026 Quality Clinical Data Registry Measure Flow for AQI ID #82: Intraoperative Antibiotic Redosing in Open Cardiac Surgeries



SAMPLE CALCULATIONS

Data Completeness =
Performance Met (a=50 procedures) + Denominator Exceptions (b=10) + Performance Not Met (c=10 procedure) = 70 procedures = 87.50%
Eligible Population / Denominator (c=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 1.0
December 2025

© 2026 Anesthesia Quality Institute. All rights reserved. Please contact Anesthesia Quality Institute at askaqi@asahq.org for permission to use any of the information in this document.

Measure Title

ePreop31: Intraoperative Hypotension (IOH) among Non-Emergent Noncardiac Surgical Cases

Measure Description: Percentage of general, neuraxial, or regional anesthesia care cases in which the mean arterial pressure (MAP) fell below 65 mmHg for a cumulative total of 15 minutes or more.

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 patient's MAP over the course of the surgery should be recorded. MAP data can be transmitted directly from the monitor to the AIMS or be entered manually into an AIMS or other electronic data capture system. If the record for a given case includes vitals pulled from the monitor and manually recorded vitals with the same time stamp, 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: MAP = 1/3 (SBP) + 2/3 (DBP) (Sesso et al. 2000).

Non-emergency surgeries include both elective and urgent surgeries.

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

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, 00454, 00470, 00472, 00474, 00500, 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, 00790, 00792, 00794, 00797, 00800, 00802, 00820, 00830, 00832, 00840, 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, 01140, 01150, 01160, 01170, 01173, 01200, 01202, 01210, 01212, 01214, 01215, 01220, 01230, 01232, 01234, 01250, 01260, 01270, 01272, 01274, 01320, 01340, 01360, 01380, 01382, 01390, 01392, 01400, 01402, 01404, 01420, 01430, 01432, 01440, 01442, 01444, 01462, 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, 01730, 01732, 01740, 01742, 01744, 01756, 01758, 01760, 01770, 01772, 01780, 01782, 01810, 01820, 01829, 01830, 01832, 01840, 01842, 01844, 01850, 01852, 01916, 01920, 01922, 01924, 01925, 01926, 01930, 01931, 01932, 01933, 01937, 01938, 01939, 01940, 01941, 01942, 01951, 01952, 01953

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

Denominator Exclusions

- **99A16** - 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: MAP = 1/3 (SBP) + 2/3 (DBP) (Sesso et al. 2000).
- **99A19** – The measure excludes patients where electronically recorded MAP/blood pressure readings are unavailable.
- **99135 CPT code** - 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.
- American Society of Anesthesiologists (ASA) Physical Status Classification of 1, 5 or 6
- Emergency case
- Cardiac Procedures
- Obstetric non-operative procedures
- Liver or lung transplant procedures
- Cataract procedures

Numerator
Patients who have a MAP below 65 mmHg that exceeds the cumulative length of 15 minutes.

Numerator Quality-Data Coding Options for Reporting Satisfactorily

Performance Met:
99A17 - MAP below 65 mmHg that exceeds the cumulative length of 15 minutes.

Performance Not Met:
99A18 - MAP does not fall below 65 mmHg for a cumulative length of 15 minutes

CBE 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 (Sessler et al. 2019). 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 (Salmasi et al. 2017). Among adult noncardiac surgery patients, 31.3 percent have experienced MAP below 65 mmHg for 10 minutes or longer (Bijker et al. 2007). Different approaches for managing patients' blood pressure during surgery are significantly associated with higher or lower risks of postoperative organ dysfunction, including renal dysfunction (Futier et al.2017).

Data Source: Administrative claims data; Other: Other: Claims, EHR (AIMS, patient record)

MIPS Reporting Option: Traditional MIPS, MVP

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

Care Setting: Hospital; Ambulatory Surgical Center; Hospital Inpatient; Hospital Outpatient

Telehealth: No

Measure Steward: Provation Anesthesia Quality Registry (AQR QCDR)/Cleveland Clinic

Number of Multiple Performance Rates: Not applicable

Proportional Measure: No

Continuous Variable Measure: No

Ratio Measure: Yes - This is a ratio measure that will score greater than or equal to zero

Risk Adjusted: Yes

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.

Use the following steps to calculate clinician-level unadjusted and risk-adjusted measure scores. Note that this measure is specified at the individual clinician-level, but those wishing to report this measure at the group level can follow the calculation steps below but perform those calculations at the group rather than clinician-level (e.g., identifying measure denominator cases associated with the provider group).

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.

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

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 of his or her patients.
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%.

The remainder of this document describes each of these steps in detail.

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

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.

1. 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).
2. 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).
3. 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).
4. 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
    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.

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

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:

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

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

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.

1. 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:

$$logit(IOH) = \beta_0 + \beta_1 * Age + \beta_2 * ASA_2 + \beta_3 * ASA_4 + \beta_4 * BMI + \beta_5 * Surg_Length_Cat_60–119 + \beta_6 * Surg_Length_Cat_120–179 + \beta_7 * Surg_Length_Cat_180–239 + \beta_8 * Surg_Length_Cat_240–299 + \beta_9 * Surg_Length_Cat_300– + \beta_{10} * Female_1$$

Where:

β_0 = the intercept term of the logistic regression

β_1 = the coefficient for age

Age = the age in years of the patient at the time of surgery (in years)

β_2 = the coefficient for ASA physical status classification being 2.

ASA_2 = a binary variable indicating whether the ASA physical status classification of the case is 2, with ASA_2=1 for cases in which the ASA physical status classification is 2, and ASA_2=0 for cases in which it is not 2.

β_3 = the coefficient for ASA physical status classification being 4.

ASA_4 = a binary variable indicating whether the ASA physical status classification of the case is 4, with ASA_4=1 for cases in which the ASA physical status classification is 4, and ASA_4=0 for cases in which it is not 4.

β_4 = the coefficient for body mass index (BMI)

BMI = the BMI of the patient at the time of surgery

β_5 = 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.

β_6 = 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.

β_7 = 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.

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

β_8 = 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.
β_9 = 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.
β_{10} = 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

Parameter	Value
β_0: Constant/Intercept	-1.576
β_1:Coefficient 1: Age	-0.008
β_2: Coefficient 2: ASA_2	0.157
β_3: Coefficient 3: ASA_4	0.529
β_4: Coefficient 4: BMI	-0.018
β_5: Coefficient 5: Surg_Length_Cat_60–119	1.316
β_6: Coefficient 6: Surg_Length_Cat_120–179	1.734
β_7: Coefficient 7: Surg_Length_Cat_180–239	1.936
β_8: Coefficient 8: Surg_Length_Cat_240–299	2.235
β_9: Coefficient 9: Surg_Length_Cat_300+	2.879
β_{10}: Coefficient 10: Female1	0.173

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:

$$IOH_{expected} = \frac{e^{\,logit(IOH)}}{1+ e^{\,logit(IOH)}}$$

Where, 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

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

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:

$$IOH_{Adjusted} = \frac{(Sum\ of\ numerator\ cases)}{(Sum\ of\ expected\ IOH\ cases)}$$

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%.

$$IOH_{Adjusted} = \frac{(Sum\ of\ numerator\ cases)}{(Sum\ of\ expected\ IOH\ cases)} * Overall_rate$$

References

Anesthesia Quality Institute. "2018 AQI NACOR Data Element Conceptual Definitions, Version 3.0." Shaumberg, IL: Anesthesia Quality Institute, January 2018. Available at http://www.aqihq.org/files/AQI_NACOR_DATA_ELEMENT_DEFINITIONS_v3%202018_FINAL.pdf. Accessed March 14, 2019.

Bijker, Jilles, Wilton A. van Klei, Teus H. Kappen, Leo van Wolfswinkel, Karel G.M. Moons, and Cor J. Kalkman. "Incidence of Intraoperative Hypotension as a Function of the Chosen Definition." Anesthesiology, vol. 107, no. 2, 2007, pp. 213–220. doi:10.1097/01.anes.0000270724.40897.8e.

Futier, E., J.-Y. Lefrant, P.-G. Guinot, T. Godet, E. Lorne, P. Cuvillon, S. Bertran, M. Leone, B. Pastene, V. Piriou, S. Molliex, J. Albanese, J. Julia, B, Tavernier, E. Imhoff, J. Bazin, J. Constantin, B. Pereira, and S. Jaber. "Effect of Individualized Versus Standard Blood Pressure Management Strategies on Postoperative Organ Dysfunction Among High-Risk Patients Undergoing Major Surgery: A Randomized Clinical Trial." *JAMA,* vol. 318, no. 14, 2017, pp. 1346–1357. doi:10.1001/jama.2017.14172.

Salmasi, Vafi, Kamal Maheshwari, Dongsheng Yang, Edward J. Mascha, Asha Singh, Daniel I. Sessler, and Andrea Kurz. "Relationship Between Intraoperative Hypotension, Defined by Either Reduction from Baseline or Absolute Thresholds, and Acute Kidney and Myocardial Injury Aafter Noncardiac Surgery: A Retrospective Cohort Analysis." *Anesthesiology,* vol. 126, no. 1, 2017, pp. 47–65. doi: 10.1097/ALN.0000000000001432.

Sessler, Daniel I., Joshua A. Bloomstone, Solomon Aronson, Colin Berry, Tong J. Gan, John A. Kellum, James Plumb, Monty G. Mythen, Michael P. W. Grocott, Mark R. Edwards, Timothy E. Miller, and the Perioperative Quality Initiative-3 Workgroup. "Perioperative Quality Initiative Consensus Statement on Intraoperative Blood Pressure, Risk and Outcomes for Elective Surgery." British Journal of Anaesthesia. Published electronically February 27, 2019. doi: 10.1016/j.bja.2019.01.013

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information. Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.

Sesso, Howard D., Meir J. Stampfer, Bernard Rosner, Charles H. Hennekens, J. Michael Gaziano, JoAnn E. Manson, and Robert J. Glynn. “Systolic and Diastolic Blood Pressure, Pulse Pressure, and Mean Arterial Pressure as Predictors of Cardiovascular Disease Risk in Men.” *Hypertension,* vol. 36, no. 5, 2000, pp. 801–807. doi: 10.1161/01.HYP.36.5.801.

This document is confidential and may be privileged or otherwise protected from disclosure and may include proprietary information.
Unauthorized reproduction or disclosure of this information in whole or in part is prohibited.