Quality Payment
PROGRAM

Emergency Medicine Measure

Merit-based Incentive Payment System (MIPS): Measure Information Form (MIF)

2024 Performance Period

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1.0 Introduction

This document details the methodology for the Emergency Medicine measure and should be reviewed along with the Emergency Medicine Measure Codes List file, which contains the medical codes used in constructing the measure.

1.1 Measure Name

Emergency Medicine episode-based cost measure

1.2 Measure Description

Episode-based cost measures represent the cost to Medicare for the items and services provided to a patient during an episode of care ("episode"). In all supplemental documentation, "cost" generally means the standardized[1] Medicare allowed amount,[2] and claims data from Medicare Parts A and B are used to construct the episode-based cost measures.

The Emergency Medicine episode-based cost measure evaluates a clinician's risk-adjusted cost to Medicare for patients who have an emergency department (ED) visit during the performance period. The measure score is the clinician's risk-adjusted cost for the episode group averaged across all episodes attributed to the clinician. This measure includes costs of Part A and B services during each episode from the start of the ED visit that opens, or "triggers," the episode through 14 days after the trigger, excluding a defined list of services for each ED visit type that are unrelated to the ED care.

1.3 Measure Rationale

Emergency department (ED) care is costly, with Medicare outpatient hospital program spending on ED visits increasing from $2.3 billion to $4.1 billion from 2011 to 2017.[3] ED clinicians play a key role in the decision to admit a patient, and appropriate admissions from the ED should be emergent and necessary, as determined by a patient's diagnosis.[4] However, admission rates vary widely across the country and across hospitals,[5,6] as well as across clinicians within

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[1] Claim payments are standardized to account for differences in Medicare payments for the same service(s) across Medicare providers. Payment standardized costs remove the effect of differences in Medicare payment among health care providers that are the result of differences in regional health care provider expenses measured by hospital wage indexes and geographic price cost indexes (GPCIs) or other payment adjustments such as those for teaching hospitals. For more information, please refer to the "CMS Part A and Part B Price (Payment) Standardization - Basics" and "CMS Part A and Part B Price (Payment) Standardization - Detailed Methods" documents posted on the CMS Price (Payment) Standardization Overview page. (https://resdac.org/articles/cms-price-payment-standardization-overview)

[2] Cost is defined by *allowed amounts* on Medicare claims data, which include both Medicare trust fund payments and any applicable beneficiary deductible and coinsurance amounts.

[3] Medicare Payment Advisory Commission. Options for slowing the growth of Medicare fee-for-service spending for emergency department services. (June 2019). https://www.medpac.gov/document/http-www-medpac-gov-docs-default-source-reports-jun19_ch11_medpac_reporttocongress_sec-pdf/

[4] A. K. Sabbatini, B. K. Nallamothu, and K. E. Kocher, "Reducing Variation in Hospital Admissions from the Emergency Department for Low-Mortality Conditions May Produce Savings," Health Aff (Millwood) 33, no. 9 (Sep 2014). https://doi.org/10.1377/hlthaff.2013.1318

[5] Sukayna Z. Alfaraj and Jesse M. Pines, "What We Can Learn from Medicare Data on Early Deaths after Emergency Department Discharge," Journal of Thoracic Disease 9, no. 7 (2017). https://doi.org/10.21037/jtd.2017.06.44

[6] J. M. Pines, R. L. Mutter, and M. S. Zocchi, "Variation in Emergency Department Admission Rates across the United States," Med Care Res Rev 70, no. 2 (Apr 2013). https://doi.org/10.1177/1077558712470565

hospitals,[7] likely due to factors other than patient characteristics.[8] The high costs associated with ED care and variation in admission rates indicate opportunities for improvement to potentially improve outcomes and lower costs of care. The Emergency Medicine episode-based cost measure was selected for development because of its high impact in terms of patient population and Medicare spending, and the opportunity for incentivizing cost-effective, high-quality clinical care in this area. Following initial feedback gathered during the Wave 4 public comment period,[9] the subsequent measure-specific clinician expert workgroup provided extensive, detailed input on this measure.

1.4 Measure Numerator

The cost measure numerator is the sum of the ratio of observed to expected[10] payment-standardized cost to Medicare for all Emergency Medicine episodes attributed to a clinician. This sum is then multiplied by the national average observed episode cost to generate a dollar figure.

1.5 Measure Denominator

The cost measure denominator is the total number of episodes from the Emergency Medicine episode group attributed to a clinician.

1.6 Data Sources

The Emergency Medicine cost measure uses the following data sources:

- Medicare Part A and B claims data from the Common Working File (CWF)
- Enrollment Data Base (EDB)
- Long Term Care Minimum Data Set (LTC MDS)[11]

1.7 Care Settings

Methodologically, the Emergency Medicine cost measure can be triggered based on claims data from the emergency department (ED).

1.8 Cohort

The cohort for this cost measure consists of patients who are Medicare beneficiaries enrolled in Medicare fee-for-service and who receive care during an ED visit that triggers an Emergency Medicine episode.

The cohort for this cost measure is also further refined by the definition of the episode group and exclusions (refer to Section 4).

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[7] Jameel Abualenain et al., "Emergency Department Physician-Level and Hospital-Level Variation in Admission Rates," Annals of emergency medicine 61, no. 6 (2013/06// 2013). https://doi.org/10.1016/j.annemergmed.2013.01.016.

[8] Smulowitz, P. B., A. J. O'Malley, L. Zaborski, J. M. McWilliams, and B. E. Landon. "Variation in Emergency Department Admission Rates among Medicare Patients: Does the Physician Matter?". Health Aff (Millwood) 40, no. 2 (Feb 2021): 251-57. https://doi.org/10.1377/hlthaff.2020.00670

[9] "Wave 4 Public Comment Summary," QPP Cost Measure Information, Prior cost measure development and input (https://www.cms.gov/medicare/quality-payment-program/cost-measures/prior).

[10] Expected costs refer to costs predicted by the risk adjustment model. For more information on expected costs and risk adjustment, please refer to Section 4.5.

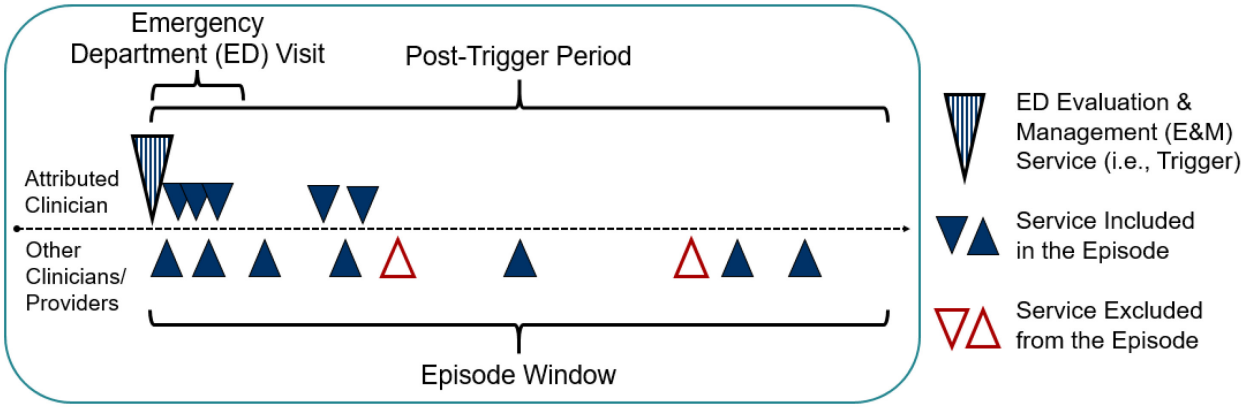
[11] For information on how LTC MDS data are used in risk adjustment, please refer to Section 4.5.

2.0 Methodology Steps

There are 2 overarching processes in calculating episode-based cost measure scores: episode construction (Steps 1-3) and measure calculation (Steps 4-6). This section provides a brief summary of these processes for the Emergency Medicine cost measure. Section 4 describes the processes in detail, and Appendix A contains a visual flowchart depicting these steps.

1. **Trigger and define an episode**: Episodes are opened, or "triggered," by billing codes that indicate an emergency department (ED) visit. The episode window starts on the day of the trigger ED visit and ends 14 days after. To enable meaningful clinical comparisons, episodes are placed into more granular, mutually exclusive and exhaustive episode sub-groups and ED visit types based on clinical criteria.
2. **Attribute the episode to a clinician**: For this episode group, an attributed clinician is any clinician who bills a trigger code for the episode group on the day of the trigger ED visit.
3. **Exclude unrelated services and calculate the episode observed cost**: Clinically unrelated services are removed from the episode. The costs of the remaining services occurring during the episode window are summed to determine each episode's standardized observed cost.

Figure 1. Diagram Showing an Example of a Constructed Episode



4. **Exclude episodes**: Exclusions remove unique groups of patients from cost measure calculation in cases where it may be impractical and unfair to compare the costs of caring for these patients to the costs of caring for the cohort at large.
5. **Calculate expected costs for risk adjustment**: Risk adjustment aims to isolate variation in clinician costs to only the costs that clinicians can reasonably influence (e.g., accounting for patient age, comorbidities, dual Medicare and Medicaid eligibility status, and other factors). A regression analysis is run using the risk adjustment variables as covariates to estimate the expected cost of each episode. Then, statistical techniques are applied to reduce the effect of extreme outliers on measure scores.
6. **Calculate the measure score:** For each episode, the ratio of standardized total observed cost (from Step 3) to risk-adjusted expected cost (from Step 5) is calculated and averaged across all of a clinician or clinician group's attributed episodes to obtain the average episode cost ratio. The average episode cost ratio is multiplied by the national average observed episode cost to generate a dollar figure for the cost measure score.

3.0 Measure Specifications Quick Reference

This page provides a quick, at-a-glance reference for the Emergency Medicine episode-based cost measure specifications. More details on each component can be found in Section 4, and the full list of codes and logic used to define each component can be found within the Measure Codes List file.

Episode Window: During what time period are costs measured?

Pre-Trigger Window: 0 days Post-Trigger Window: 14 days

Triggers: Patients receiving what medical care are included in the measure?

- Evaluation and management (E/M) Current Procedural Terminology / Healthcare Common Procedure Coding System (CPT/HCPCS) code indicating emergency department (ED) visit

Stratifications: What are the mutually exclusive types of episodes?

The measure is divided into the following 28 ED visit types:

1. Abdominal Pain, Nausea, and Vomiting
2. Altered Mental State
3. Behavioral Health
4. Cancer
5. Diabetes
6. ENT and Eye Disorders
7. Fracture
8. Gastrointestinal or Liver Conditions
9. General Infection
10. Gynecological Disorders
11. Health Care Maintenance
12. Hematologic and Immunologic
13. Kidney and Urinary
14. Neurologic
15. Non-Diabetic Endocrine Conditions
16. Non-Fracture Musculoskeletal
17. Non-Respiratory Chest Pain
18. Other Cardiovascular
19. Peripheral Vascular
20. Poisoning
21. Pregnancy
22. Respiratory
23. Sepsis
24. Skin Conditions, Rashes, and Abscesses
25. Stroke
26. Syncope
27. Trauma: Major or Head
28. Trauma: Minor or Unclear Severity

**29. Medical Complications (excluded)*

Each ED visit type is also stratified into the following sub-groups:

1. Subsequent observation care or inpatient admission
2. Discharged without subsequent observation care or inpatient admission

Services: Which costs are included in the measure?

For the Emergency Medicine measure, Medicare Part A and Part B services during the episode window are included in the episode costs, with exceptions for clinically unrelated services. The service exclusion rules are defined specific to the ED Visit Type of the episode.

Risk Adjustors: Which risk factors are accounted for in the risk adjustment model?

- Standard risk adjustors, including comorbidities captured by 86 Hierarchical Condition Category (HCC) codes that map with thousands of ICD-10-CM diagnosis codes, interaction variables accounting for a range of comorbidities, patient age category, patient disability status, patient end-stage renal disease (ESRD) status, patient dual eligibility status, and recent use of institutional long-term care.
- Measure-specific risk adjustors including Medicare Severity-Diagnosis Related Group (MS-DRG) of inpatient stay for episodes that end in inpatient admission, episodes triggered in a critical access hospital (CAH), and episodes with transfers from an inpatient rehabilitation facility (IRF), long-term care hospital (LTCH), or skilled nursing facility (SNF). For the full list of standard and measure-specific risk adjustment variables, please reference the “RA” and “RA_Details” tabs of the Measure Codes List file.

Exclusions: Which populations are excluded from measure calculation?

- Standard exclusions to ensure data completeness:
  - The patient has a primary payer other than Medicare for any time overlapping the episode window or 120-day lookback period prior to the trigger day.
  - The patient was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or was enrolled in Part C for any part of the lookback plus episode window.
  - The patient's date of birth is missing.
  - The patient's death date occurred before the episode ended.
- Measure-specific exclusions including episodes with hospital-to-hospital transfers, episodes with ED-to-ED transfers, and medical complications.

4.0 Detailed Measure Methodology

This section contains the technical details for the 2 overarching processes in calculating episode-based cost measure scores in more detail: Sections 4.1 through 4.3 describe episode construction and Sections 4.4 through 4.6 describe measure calculation.

4.1 Trigger an Episode and Define an ED Visit

Emergency Medicine episodes are defined by evaluation and management (E/M) Current Procedural Terminology / Healthcare Common Procedure Coding System (CPT/HCPCS) codes on Part B Physician/Supplier (Carrier) claims that indicate an emergency department (ED) visit. For the codes and logic relevant to this section please refer to the “Triggers” tab of the Emergency Medicine Measure Codes List.

The steps for defining an episode for the Emergency Medicine episode group are as follows:

- **Identify** Part B Physician/Supplier claim lines with positive standardized payment that have a trigger E/M code.
- **Trigger** an episode if all the following conditions are met for identified Part B Physician/Supplier claim line:
    - It was billed by a clinician of a specialty that is eligible for MIPS.
    - It is the highest cost claim line across all claim lines identified in the above bullets and that have any Emergency Medicine trigger code billed for the patient on that day.
- **Establish** the episode window as follows:
    - Establish the episode trigger date as the expense date of the trigger claim line identified in the "Trigger an episode" bullet above.
    - Establish the episode start date as the episode trigger date.
    - Establish the episode end date as 14 days after the episode trigger date.
- **Define** an ED visit as follows:
    - Identify the trigger claim as the first day of the ED visit.
    - Identify additional instances of billing codes indicating a continued ED stay, if applicable.
        - Extend the ED visit when either:
            - An additional Part B Physician/Supplier claim line with a trigger E/M code is identified on the subsequent day immediately following the trigger date, or
            - An additional Part B Physician/Supplier claim line with an observation care code is identified on the subsequent day immediately following the trigger date.
        - Repeat for adjacent days immediately following the trigger date until a day with no additional trigger codes or observation care codes is found, signifying the end of the ED visit.
            - If no additional trigger or observation care codes are found on the day immediately following the trigger date, this signifies the end of the ED visit.

Once an Emergency Medicine episode is triggered, the episode is stratified into an ED visit type to enable meaningful clinical comparisons. ED visit types represent more granular, mutually exclusive and exhaustive patient populations defined by clinical criteria (i.e., diagnosis information available on the patient’s claims during the ED visit, and MS-DRG of subsequent inpatient stay when present). Given the goal of the Emergency Medicine measure to capture the broader universe of care provided in the emergency setting, ED visit types are useful in

ensuring clinical comparability so that the corresponding cost measure fairly compares clinicians with a similar patient case-mix. The Emergency Medicine measure has 28 ED visit types, and excludes a “Medical Complications” visit type.

1. Abdominal Pain, Nausea, and Vomiting
2. Altered Mental State
3. Behavioral Health
4. Cancer
5. Diabetes
6. ENT and Eye Disorders
7. Fracture
8. Gastrointestinal or Liver Conditions
9. General Infection
10. Gynecological Disorders
11. Health Care Maintenance
12. Hematologic and Immunologic
13. Kidney and Urinary
14. Neurologic
15. Non-Diabetic Endocrine Conditions
16. Non-Fracture Musculoskeletal
17. Non-Respiratory Chest Pain
18. Other Cardiovascular
19. Peripheral Vascular
20. Poisoning
21. Pregnancy
22. Respiratory
23. Sepsis
24. Skin Conditions, Rashes, and Abscesses
25. Stroke
26. Syncope
27. Trauma: Major or Head
28. Trauma: Minor or Unclear Severity

**29. Medical Complications (excluded)*

ED visit types are defined by a mapping of 3-digit diagnosis codes and MS-DRGs. Visit types are assigned based on an empirically informed hierarchy:

1. If the ED visit ends in an inpatient admission, assign the visit type based on the MS-DRG of the respective inpatient admission. Otherwise, use diagnosis information for the ED visit detailed in the following steps.
2. If one of the ED visit type diagnoses is found on any of the ED visit claim, then the ED visit is assigned the corresponding visit type.
3. If more than one diagnoses is found across the ED visit claims that are part of the definitions for more than one ED visit type, the ED visit is assigned to the ED visit type based on a hierarchy (please refer to the Measure Codes List for details).
4. If no diagnoses are found, the ED visit is undefined and is excluded.

Diagnosis codes and MS-DRGs used to define each ED visit type can be found in the “ED_Visit_Types_Codes” tab of the Emergency Medicine Measure Codes List file.

Each ED visit is also stratified into one of 2 sub-groups, based on the patient’s outcome following the visit:

- Subsequent observation care or inpatient admission
- Discharged without subsequent observation care or inpatient admission

4.2 Attribute Episodes to a Clinician

Once an episode has been triggered and defined, it is attributed to one or more clinicians of a specialty that is eligible for MIPS. Clinicians are identified by Taxpayer Identification Number (TIN) and National Provider Identifier (NPI) pairs (TIN-NPI), and clinician groups are identified by TIN. Only clinicians of a specialty that is eligible for MIPS or clinician groups where the triggering clinician is of a specialty that is eligible for MIPS are attributed episodes. For codes relevant to this section, please refer to the “Attribution” tab of the Emergency Medicine Measure Codes List.

The steps for attributing an Emergency Medicine episode are as follows:

- **Identify** claim lines with positive standardized payment for any trigger codes that occur on the episode trigger day.
- **Attribute** an episode to any TIN-NPI billing the trigger codes.

- **Attribute** episodes to the TIN by aggregating all episodes attributed to NPIs that bill to that TIN. If the same episode is attributed to more than one NPI within a TIN, the episode is attributed only once to that TIN.

Future attribution rules may benefit from the implementation of patient relationship categories[12] and codes.[13] As required by Section 101(f) of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), CMS will consider how to incorporate the patient relationship categories into episode-based cost measurement methodology as clinicians and billing experts gain experience with them.[14]

4.3 Exclude Clinically Unrelated Services to Calculate Episode Observed Cost

A cost measure should include costs that reflect the role of the attributed clinician. As this measure aims to comprehensively assess the broad scope of ED care, the measure applies a similarly broad approach to grouping services. Medicare Part A and Part B services during the episode window are included in the episode costs, with exceptions for clinically unrelated services, an approach discussed with the Emergency Medicine Clinician Expert Workgroup. The service exclusion rules are defined specific to the ED Visit Type of the episode. The service exclusion codes and logic for services deemed clinically unrelated can be found in the "Services" tab of the Measure Codes List file. The sum of the cost of the services that are included in the episode is referred to as the episode observed cost.

4.4 Exclude Episodes

Before measure calculation, episode exclusions are applied to remove certain episodes from measure score calculation. Certain exclusions are applied across all episode groups, and other exclusions are specific to this measure, based on consideration of the clinical characteristics of a homogenous patient cohort.

The steps for episode exclusion are as follows:

- **Exclude** episodes from measure calculation if:
    - The patient has a primary payer other than Medicare for any time overlapping the episode window or 120-day lookback period prior to the trigger day.
    - The patient was not enrolled in Medicare Parts A and B for the entirety of the lookback period plus episode window, or was enrolled in Part C for any part of the lookback plus episode window.
    - The patient's date of birth is missing.
    - The patient's death date occurred before the episode ended.

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[12] The MACRA Patient Relationship Categories aim to distinguish the relationship and responsibility of a clinician with a patient at the time of furnishing an item or service, thereby facilitating the attribution of patients and episodes to one or more clinicians for purposes of measure score calculations. For more information on Patient Relationship Categories, please refer to the Patient Relationship Categories and Codes operational list. (https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/CMS-Patient-Relationship-Categories-and-Codes.pdf)

[13] The MACRA Patient Relationship Codes are Healthcare Common Procedure Coding System (HCPCS) Level II modifier codes that clinicians report on claims to identify their patient relationship category. For the Patient Relationship Codes, please refer to Table 27 of the CY 2018 Physician Fee Schedule final rule. (https://www.federalregister.gov/d/2017-23953/p-2203)

[14] For more information on the Patient Relationship Categories and Codes, please download the FAQ. (https://qpp-cm-prod-content.s3.amazonaws.com/uploads/236/Patient-Relationship-Categories-and-Codes-webinar-FAQ.pdf)

- An ED-to-ED transfer occurs (i.e., the patient is transferred to another ED facility from the triggering ED facility).
- A hospital-to-hospital transfer occurs (i.e., the patient's original ED visit ends in an inpatient hospital admission and the patient is then transferred to another hospital).

4.5 Estimate Expected Costs through Risk Adjustment

Risk adjustment is used to estimate expected episode costs in recognition of the different levels of care patients may require due to comorbidities, disability, enrollment status, age, and other risk factors. The risk adjustment model includes variables from the CMS Hierarchical Condition Category Version 24 (CMS-HCC V24) 2021 Risk Adjustment Model,[15] as well as other standard risk adjustors (e.g., patient age) and variables for clinical factors that may be outside the attributed clinician's reasonable influence. A full list of risk adjustment variables can be found in the "RA" and "RA_Details" tabs of the Emergency Medicine Measure Codes List file.

Steps for defining risk adjustment variables and estimating the risk adjustment model are as follows:

- **Define** HCC and episode group-specific risk adjustors using service and diagnosis information found on the patient's Medicare claims history in the 120-day period prior to the episode trigger date (or the timing specified in the "RA_Details" tab of the Measure Codes List file) for certain billing codes that indicate the presence of a procedure, condition, or characteristic.
- **Define** other risk adjustors that rely upon Medicare beneficiary enrollment and assessment data as follows:
  - Identify patients who are originally "Disabled without ESRD" or "Disabled with ESRD" using the original reason for joining Medicare field in the Medicare beneficiary EDB.
  - Identify patients with ESRD if their enrollment indicates ESRD coverage, ESRD dialysis, or kidney transplant in the Medicare beneficiary EDB in the lookback period.
  - Identify patients who have spent at least 90 days in a long-term care institution without having been discharged to the community for 14 days, based on LTC MDS assessment data, during the lookback period.
  - Identify beneficiaries who have partial or full dual Medicare and Medicaid eligibility status as of the episode start date; adjust for dual eligibility status when risk-adjusted costs are on average higher for dually enrolled beneficiaries (i.e., drop risk adjustor when coefficient is less than 0).
- **Drop** risk adjustors that are defined for less than 15 episodes nationally for each ED visit type to avoid using very small samples.
- **Categorize** patients into age ranges using their date of birth information in the Medicare beneficiary EDB. If an age range has a cell count less than 15, collapse this in the next adjacent age range category towards the reference category (65-69).
- **Include** the MS-DRG of the associated inpatient stay as a categorical risk adjustor for episodes ending in inpatient admission.
- **Run** an ordinary least squares (OLS) regression model to estimate the relationship between all the risk adjustment variables and the dependent variable, the standardized

[15] CMS uses an HCC risk adjustment model to calculate risk scores. The HCC model ranks diagnoses into categories that represent conditions with similar cost patterns. Higher categories represent higher predicted healthcare costs, resulting in higher risk scores. The 86 HCC codes included in the CMS-HCC V24 model are mapped to thousands of ICD-10-CM diagnosis codes.

observed episode cost, to obtain the risk-adjusted expected episode cost. A separate OLS regression is run for each episode ED visit type and sub-group combination nationally.

- **Winsorize**[16] expected costs as follows.
  - Assign the value of the 0.5th percentile to all expected episode costs below the 0.5th percentile.
  - Renormalize[17] values by multiplying each episode's winsorized expected cost by the ED visit type/sub-group combination's average expected cost, and dividing the resultant value by the ED visit type/sub-group combination's average winsorized expected cost.
- **Exclude**[18] episodes with outliers as follows. This step is performed separately for each ED visit type/sub-group combination.
  - Calculate each episode's residual as the difference between the re-normalized, winsorized expected cost computed above and the observed cost.
  - Exclude episodes with residuals below the 1st percentile or above the 99th percentile of the residual distribution.
  - Renormalize the resultant expected cost values by multiplying each episode's winsorized expected costs after excluding outliers by the ED visit type/sub-group combination's average standardized observed cost after excluding outliers, and dividing by the ED visit type/sub-group combination's average winsorized expected cost after excluding outliers.

4.6 Calculate Measure Scores

Measure scores are calculated for a TIN or TIN-NPI as follows:

- Calculate the ratio of observed to expected episode cost for each episode attributed to the clinician/clinician group.
- Calculate the average ratio of observed to expected episode cost across the total number of episodes attributed to the clinician/clinician group.
- Multiply the average ratio of observed to expected episode cost by the national average observed episode cost to generate a dollar figure representing risk-adjusted average episode cost.

The clinician-level or clinician group practice-level risk-adjusted cost for any attributed clinician (or clinician group practice) "j" can be represented mathematically as:

$$Measure\ Score_j = \left(\frac{1}{n_j}\sum_{i \in I_j}\frac{Y_{ij}}{\widehat{Y_{ij}}}\right)\left(\frac{1}{n}\sum_{j}\sum_{i \in \{I_j\}} Y_{ij}\right)$$

[16] Winsorization aims to limit the effects of extreme values on expected costs. Winsorization is a statistical transformation that limits extreme values in data to reduce the effect of possible outliers. Winsorization of the lower end of the distribution (i.e., bottom coding) involves setting extremely low predicted values below a predetermined limit to be equal to that predetermined limit.

[17] Renormalization is performed after adjustments are made to the episode's expected cost, such as bottom-coding or residual outlier exclusion. This process multiplies the adjusted values by a scalar ratio to ensure that the resulting average is equal to the average of the original value.

[18] This step excludes episodes based on outlier residual values from the calculation and renormalizes the resultant values to maintain a consistent average episode cost level.

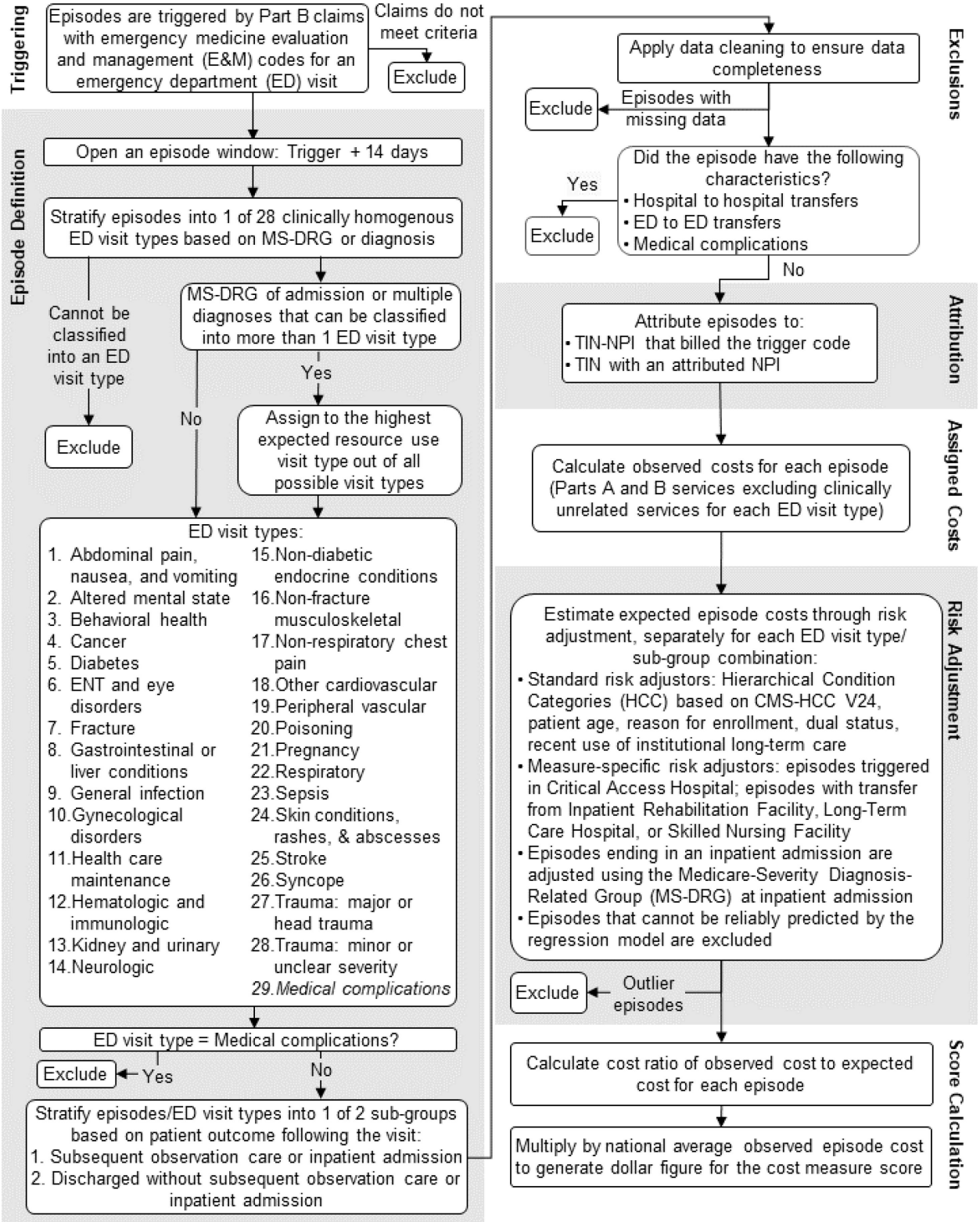
where:

Y_{ij}	is the standardized payment for episode *i* and attributed clinician (or clinician group practice) *j*
$\hat{Y}_{ij}$	is the expected standardized payment for episode *i* and clinician (or clinician group practice) *j*, as predicted from risk adjustment
n_j	is the number of episodes for clinician (or clinician group practice) *j*
n	is the total number of TIN/TIN-NPI attributed episodes nationally
$i \epsilon \{I_j\}$	is all episodes *i* in the set of episodes attributed to clinician (or clinician group practice) *j*

A diagram demonstrating a visual depiction of an example measure calculation can be found in Appendix B.

A lower measure score indicates that the observed episode costs are lower than or similar to expected costs for the care provided for the particular patients and episodes included in the calculation, whereas a higher measure score indicates that the observed episode costs are higher than expected for the care provided for the particular patients and episodes included in the calculation.

Appendix A. Measure Flowchart for Emergency Medicine



Appendix B. Measure Calculation Example

The diagram below provides an illustrated example of measure calculation, using an example measure where the clinician has only 4 attributed episodes for demonstration purposes. For more details on measure calculation, please refer to Section 4.6.

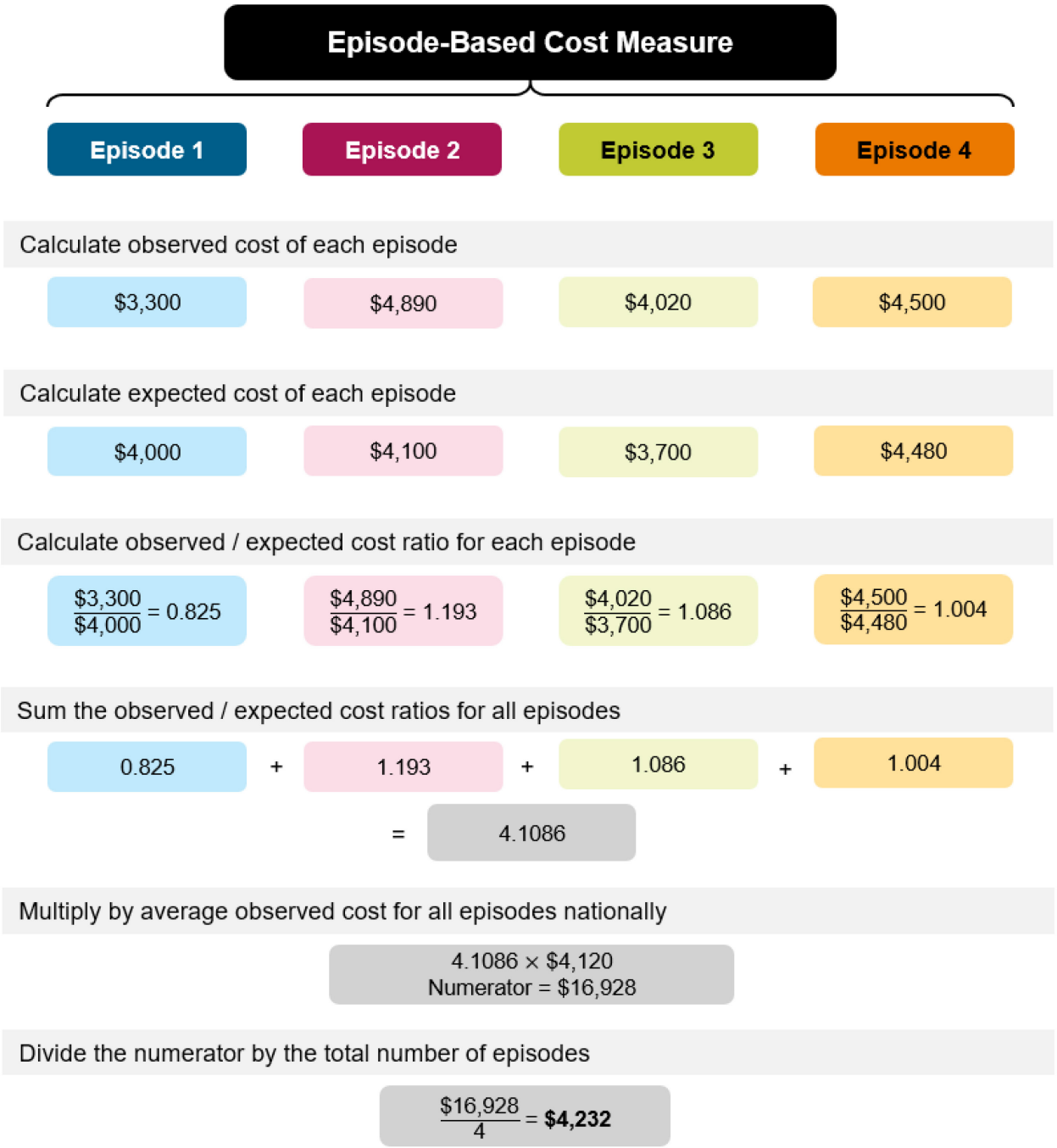



Figure B-1. Episode-Based Cost Measure Calculation Example