2025 Pre-Rulemaking Measure Review
Preliminary Assessment

MUC ID	Title
MUC2025-019	Inappropriately Broad Empiric Antibiotic Selection for Adult Hospitalized Patients with Uncomplicated Community-Acquired Pneumonia
Measure Steward & Developer	**Proposed CMS Programs**
University of Utah	Hospital Inpatient Quality Reporting Program Link: Hospital Inpatient Quality Reporting Program Medicare Promoting Interoperability Program Link: Medicare Promoting Interoperability Program

Measure Overview
Rationale: The overall objective of this electronic clinical quality measure is to quantify inappropriately broad empiric antibiotic use in hospitalized adults with uncomplicated community-acquired pneumonia (CAP). Here, we defined "inappropriately broad" as any antibiotic therapy targeting methicillin-resistant Staphylococcus aureus (MRSA) or Pseudomonas aeruginosa in patients without risk factors for one of those organisms.
CMS-provided program rationale: Determining the appropriate antibiotics to treat uncomplicated community-acquired pneumonia (CAP) is important to ensure patient safety and avoid overuse of broad empiric antibiotics best utilized to target CAP-specific organisms. A standard process to evaluate overprescription of broad empiric antibiotics for CAP can mitigate inappropriate or overuse of these antibiotics, which is vital because such inappropriate/overuse can lead to potential negative patient outcomes, including kidney injury or secondary infections.
Description: Percentage of adult non-ICU hospitalized patients with uncomplicated pneumonia who: a) did not have risk factors for methicillin-resistant Staphylococcus aureus (MRSA or Pseudomonas aeruginosa, and b) received empiric (within first 48 hours of emergency department arrival) antibiotics targeting MRSA or Pseudomonas aeruginosa. Percentage reported annually at the hospital level.
Measure background: New measure never reviewed by the Measure Applications Partnership (MAP) Workgroup or PRMR; never used in a Medicare program.
Numerator: From the denominator population (all payer cohort of adult non-ICU hospitalized patients with uncomplicated pneumonia without risk factors for methicillin-resistant Staphylococcus aureus (MRSA or Pseudomonas aeruginosa), identify patients who received empiric (within first 48 hours of emergency department arrival) antibiotics targeting MRSA or Pseudomonas aeruginosa. **Exclusions:** For this measure, only IV vancomycin is considered anti-MRSA therapy: therefore, oral and/or intramuscular routes for vancomycin are excluded. (Our measure coding reflects this.)
Denominator: Identify all adult patients with an inpatient (or observation) non-intensive care unit (ICU) hospitalization in which the discharge diagnosis includes pneumonia or sepsis plus respiratory failure, who: a) received a respiratory antibiotic within 48 hours of hospitalization, b) had chest imaging within +/- 3 days of the hospital encounter, c) were not transferred from another hospital, and d) did not have a concurrent infection. Restrict to patients with uncomplicated pneumonia and without risk factors for

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Measure Overview

MRSA or Pseudomonas aeruginosa.
Exclusions: To identify uncomplicated community-acquired pneumonia (CAP) patients: Exclude if any of the following are documented in association with the admission:
• On mechanical ventilation in first 48 hours
• Absolute neutrophil count < 500 cells/uL
• Cystic fibrosis
• Bronchiectasis
• Human immunodeficiency virus (HIV)
• Tracheostomy
• Transplant in prior year
• Hematologic malignancy
• Pulmonary complication (empyema, lung abscess, necrotizing pneumonia
Exclude patients with risk factors for Methicillin-resistant Staphylococcus aureus
• (MRSA)/ Pseudomonas aeruginosa:
• Pseudomonas aeruginosa in respiratory culture in prior year
• MRSA in respiratory culture in prior year
• Severe pneumonia* + prior hospitalization with IV antibiotics in past 3 months
• *defined by >= 2 of the following on a single day in the first 48 hours of encounter:
  ○ Respiratory rate > 30 breaths/min
  ○ >= 5L oxygen or SpO2< 90
  ○ White blood cell count (WBC) <4000 cell/uL
  ○ Blood urea nitrogen (BUN) > 20 mg/dL
  ○ Platelets < 100 K/uL
  ○ Temperature < 36 C
  ○ Systolic blood pressure (SBP) < 80 mmHg
Exceptions: None

Substantive changes from prior version (if applicable): Not Applicable

Measure type: Process	**Measure is a composite:** No **Measure is digital and/or an eCQM:** Yes **Measure is a paired or group measure:** No
Level of analysis: Facility	**Data source(s):** Digital-Electronic Health Record (EHR) Data
Care setting(s): Community hospital; Hospital inpatient acute care facility; Veterans Health Administration facility	**Risk adjustment or stratification:** No
CBE endorsement status: Endorsed	**CBE endorsement history:** Endorsed with

Measure Overview	
	conditions in 2025. Conditions of endorsement are that when the measure returns for maintenance (3 years), the measure developer should have: • Continued to explore the exclusion list to determine if changes are needed (e.g., empirical analyses with broader testing across entities) and to further clarify the conditions and justify them based on burden; and • Conducted additional validity testing (data element in additional EHR).
Is measure currently used in CMS programs? No	**Measure addresses statutorily required area?** No

Evaluation

Meaningfulness

Importance	
Type of evidence:	Clinical Guidelines or USPSTF (U.S. Preventive Services Task Force) Guidelines; Empirical data; Peer-Reviewed Original Research [Measures Under Consideration Entry/Review Information Tool (MERIT) Submission Form]
Importance: Broad empiric antibiotic overuse is a national public health concern believed to cause 1.27 million deaths globally and to indirectly contribute to 4.95 million deaths each year. The developer notes that this measure will improve quality of care by creating a standardized process to assess overprescription of broad empiric antibiotics for CAP, which is the most common reason for inpatient antibiotic use. Literature provided by the developer notes that inappropriate use of broad empiric antibiotics for CAP is currently common and can lead to negative patient outcomes including increased adjusted risk of death, kidney injury, and secondary infections. Thus, in addition to addressing the public health risk of antibiotic overuse, this measure will lead to better outcomes for patients hospitalized with CAP. The evidence supporting the importance of this measure was found to be sufficient during CBE endorsement review in 2025	
Rating: Met; Prior CBE Endorsement	

Conformance
Measure alignment with conceptual intent: The goal of this measure is to quantify inappropriately broad empiric antibiotic use in hospitalized adults with uncomplicated CAP. “Inappropriately broad” is defined as any antibiotic therapy targeting MRSA or Pseudomonas aeruginosa in patients without risk factors for one of those organisms. The denominator includes all adult patients with a non-ICU inpatient stay with uncomplicated pneumonia and without risk factors for MRSA or Pseudomonas aeruginosa. The numerator includes all patients from the denominator who received empiric antibiotics targeting MRSA or Pseudomonas aeruginosa. This measure aligns with the Hospital Inpatient Quality Reporting Program objective to improve the quality of care that hospitals provide and to distribute clearly defined and objective data about hospital performance as well as the Promoting Interoperability Program’s goal commitment to promoting and prioritizing interoperability and exchange of health care data.
Rating: Met

Feasibility	
eCQM feasibility testing/analysis conducted:	Yes

Feasibility
Feasibility: This measure is an eCQM. All data elements are in structured fields in electronic sources and align with the United States Core Data for Interoperability (USCDI)/USCDI+ Quality standard definitions. This eCQM was tested in three EHRs and demonstrated a high level of feasibility. The feasibility scorecard addresses the following domains: • Data availability: Data element exists in a structured format in this EHR. • Data accuracy: Information is from authoritative source and/or is highly likely to be correct. • Data standards: Data element is coded in a nationally accepted terminology standard or can be mapped to that terminology standard. • Workflow: The data element is routinely collected during clinical care and requires no, or limited, additional data entry from a clinician or other provider, and no EHR interface changes. Feasibility testing identified four data elements that required additional review within an EPIC testing site. For the three lab tests that were not coded or mapped to terminology standards, the feasibility plan indicates that a list of eligible tests corresponding to individual codes may be used to pull information from these searchable fields. The feasibility plan indicates that "Procedure, Performed: Transfer from other hospital" is searchable and will be assessed for potential improvements to streamline this process in future testing. The feasibility of this measure was found sufficiently demonstrated during CBE endorsement review in 2025. **Considerations for the committee:** The committee may wish to consider the impact of conducting feasibility testing within the US Department of Veterans Affairs (VA) system. Based on clinical and professional experience, is it reasonable to expect similar levels of feasibility for non-VA hospitals?
Rating: Met; Prior CBE Endorsement

Validity	
Validity testing method(s):	Face Validity, Data Element Validity, Empiric Validity [MERIT Submission Form]
Testing level(s)	Facility
Was this measure tested in the same target population as the CMS program?	Yes
Validity: The technical expert panel (TEP) was used to establish face validity. A majority of TEP members (71.4% [5/7]) agreed or strongly agreed that the measure as specified can be used to distinguish between better- and worse-performing hospitals, suggesting high face validity; 28.6% (2/7) were neutral. Data element validity was established through chart abstraction. To assess empirical validity, the measure developer examined the relationship between a similar measure (excess antibiotic duration for CAP) and this measure. The two measures were correlated	

Validity
at the hospital level (R=0.3, p=0.0014), suggesting the measure is empirically valid. Testing in populations representative of the CMS program population supports the external validity of the measure. The validity of this measure was found sufficiently demonstrated during CBE endorsement review in 2025.
Threats to validity: The measure developer did not address threats to validity in their application. The measure is not risk adjusted or stratified because it is a process measure. **Considerations for the committee:** The committee may wish to consider the impact of conducting empiric validity testing within the VA system. Based on clinical and professional experience, is it reasonable to expect similar levels of validity for non-VA hospitals?
Rating: Met; Prior CBE Endorsement

Reliability	
Reliability testing method(s):	Signal-to-Noise (e.g., Beta-Binomial, Mixed Logistic Regression)
Testing level:	Entity level
Reliability discussion: The developer assessed hospital-level reliability using two models: a signal-to-noise analysis via mixed-effects logistic regression and a beta-binomial regression approach, both applied to data from 109 VA hospitals. These analyses determined the minimum number of annual case abstractions needed to achieve reliability thresholds (e.g., 56 cases for 0.7 reliability, 96 for 0.8 reliability), showing that most VA hospitals already meet or exceed these benchmarks. While the VA system may underestimate variability compared to a national sample, the findings suggest that achieving high reliability is feasible across similarly structured health care systems. The reliability of this measure was found sufficiently demonstrated during CBE endorsement review in 2025.	
Additional reliability analyses: Battelle staff performed additional assessment of reliability testing data to provide committee members a standardized format to assess reliability by decile across measures. The developer calculated signal-to-noise reliability using a dataset of 47,034 persons across 109 facilities. The reliability of the first decile is 62.5%, indicating that at least 90% of the entities have a reliability greater than the threshold of 0.6. **Considerations for the committee:** The committee may wish to consider the impact of testing reliability within the VA system. Based on clinical and professional experience, is it reasonable to expect similar levels of reliability for non-VA hospitals?	
Rating: Met; Prior CBE Endorsement	

Reliability Tables

The developer provided information by decile for performance scores and calculated reliability for the 109 entities described in the testing submission. Tables 1 and 2 show deciles by performance score and reliability. Battelle created Table 1. For this measure, a lower score indicates better quality of care. The measure developer provided Table 2. These tables provide reviewers with a standardized format to assess reliability.

Table 1. MUC2025-019 Performance Score Deciles

Highest Performers ← **Lowest Performers**

-	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Mean Score	30.4	7.7	13.5	19.8	23.7	26.7	28.4	30.2	32.5	35.2	37.6	42.4	49.0
Entities	109	1	11	11	11	11	10	11	11	11	11	11	1

Table 2. MUC2025-019 Mean Reliability (by Reliability Decile)

-	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Reliability	99.9%	29.1%	62.5%	81.7%	86.6%	88.3%	90.8%	91.5%	92.5%	94.2%	95.1%	96.3%	49.0
Number of Entities	109	1	11	11	11	11	10	11	11	11	11	11	1
Number of Persons/ Encounters/Episodes	47,034	8	591	1,777	2,610	3,127	3,315	4,298	5,044	6,353	8,161	11,758	1,564

Usability	
Usability considered in application:	Yes, the submission materials briefly discuss the measure's usability within relevant programs.
Usability discussion: The measure developer provides empirical evidence that hospitals can reduce inappropriate broad spectrum antibiotic use for CAP. Using the chart-based form of this measure, they reported a 42% relative decrease in inappropriate empiric anti-MRSA/anti-Pseudomonal therapy across 69 Michigan hospitals from Quarter 2 of 2020 (22%) to Quarter 2 of 2024 (13%, P<0.0001). The use/usability of this measure was found sufficiently demonstrated during CBE endorsement review in 2025.	
Rating: Met; Prior CBE Endorsement	

Appropriateness of Scale

Appropriateness of Scale	
Similar or related measures in program(s):	Excess Days in Acute Care after Hospitalization for Pneumonia is a related measure within the Hospital Inpatient Quality Reporting (IQR) Program.

Measure balance, burden, and value across target populations/measured entities: The developer notes that pneumonia is a well-established target of clinical quality and safety monitoring and provides an extensive list of existing and prior measures for pneumonia as well as existing measures for antibiotic use that may be influenced by measures of treatment of pneumonia in their submission materials. However, no directly competing measures are currently active in either the Hospital IQR or Promoting Interoperability programs. This is because appropriate use of antibiotics is part of antibiotic stewardship, which is a priority for national organizations and professional societies.

Regarding balance of this measure's performance, burden, and benefit across populations, the developer's literature review and analysis do not indicate a potential for differential benefit or harm to specific subgroups of participating entities or their patient populations.

Considerations for the committee: Based on clinical and professional experience, the committee should consider the distribution of benefit and risks/burdens of the measure within the proposed program population.

Time-to-Value Realization

Time-to-Value Realization	
Plan for near- & long-term impacts after implementation:	None specified

Measure implementation impacts over time: The measure developer does not specifically discuss the near- and long-term impacts of implementing this measure on measured entities or patients. However, they shared data from an empirical study with 69 Michigan hospitals that showed a reduction in inappropriate empiric antibiotic use over a 4-year period after implementing a chart-based form of this measure.

Considerations for the committee:

- What are the potential near- and long-term impacts of this measure on measured entities, the Hospital Inpatient Quality Reporting Program, the Medicare Promoting Interoperability Program, and patient populations?
- Will benefits and burdens associated with this measure be realized within an appropriate implementation time frame?
- How will this measure mature through revisions in the future if added to the Hospital Inpatient Quality Reporting Program and Medicare Promoting Interoperability Program measure sets?