Quality ID #407: Appropriate Treatment of Methicillin-Susceptible Staphylococcus Aureus (MSSA) Bacteremia
– National Quality Strategy Domain: Effective Clinical Care
– Meaningful Measure Area: Healthcare Associated Infections

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of patients with sepsis due to MSSA bacteremia who received beta-lactam antibiotic (e.g. Nafcillin, Oxacillin or Cefazolin) as definitive therapy

INSTRUCTIONS:
This measure is to be submitted **each episode** a patient is hospitalized with sepsis due to MSSA bacteremia during the performance period. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. 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. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

DENOMINATOR:
All hospitalized patients with sepsis due to MSSA bacteremia

> ***DENOMINATOR NOTE:*** *A patient 18 years or older who has an initial inpatient encounter with symptoms of bacteremia that is documented of being methicillin-susceptible staphylococcus aureus.*
>
> **Denominator Criteria (Eligible Cases):**
> All patients 18 years or older
> **AND**
> **Diagnosis for Sepsis due to MSSA (ICD-10-CM):** A41.01
> **AND**
> **Patient encounter during performance period (CPT):** 99218, 99219, 99220, 99221, 99222, 99223, 99231, 99232, 99233, 99234, 99235, 99236, 99291

NUMERATOR:
Number of denominator eligible patients treated with a beta-lactam antibiotic (e.g. Nafcillin, Oxacillin or Cefazolin) as definitive therapy

> **Definition:**
> **Beta-Lactam** – For the purposes of this measure, a beta-lactam antibiotic is defined as Nafcillin, Oxacillin or Cefazolin.

Numerator Options:

Performance Met: Patient treated with a beta-lactam antibiotic as definitive therapy **(G9558)**

OR

Denominator Exception: Documentation of medical reason(s) for not prescribing a beta-lactam antibiotic (e.g., allergy, intolerance to beta-lactam antibiotics) **(G9559)**

OR

Performance Not Met: Patient not treated with a beta-lactam antibiotic as definitive therapy, reason not given **(G9560)**

RATIONALE:

With the increase of methicillin-resistant Staphylococcus aureus (MRSA) infections, clinicians have responded by choosing antibiotics that are effective against MRSA, typically vancomycin, for empiric therapy for suspected staphylococcal infections. Clinicians frequently start vancomycin therapy for cases of suspected staphylococcal infection and continue treatment with vancomycin despite the identification of methicillin-susceptible S. aureus (MSSA) as being the infecting pathogen, which can be more effectively treated with a beta-lactam antibiotic. Studies have shown that vancomycin is inferior to beta-lactam to treat MSSA and vancomycin-use leads to higher infection- related mortalities and recurrence of infections in patients with MSSA as well as leading to potential antibiotic resistance.

CLINICAL RECOMMENDATION STATEMENTS:

The following evidence statements are cited from the referenced clinical guideline and manuscripts. Only selected portions of the clinical guideline and manuscripts are quoted here; for more details, please refer to the full guideline and manuscripts.

Vancomycin has been the mainstay of parenteral therapy for MRSA infections. However, its efficacy has come into question, with concerns over its slow bactericidal activity, the emergence of resistant strains, and possible “MIC creep” among susceptible strains. Vancomycin kills staphylococci more slowly than do β-lactams in vitro, particularly at higher inocula (107–109 colony-forming units) and is clearly inferior to β-lactams for MSSA bacteremia and infective endocarditis.

Patients with S. aureus infective endocarditis (IE) have demonstrated positive blood cultures after 7 days of therapy with vancomycin and have a slower response and longer duration of bacteremia than patients treated with β-lactams. One in vivo study evaluated the efficacy of β-lactam antibiotics versus vancomycin in the treatment of S. aureus infections. Investigators observed that β-lactam antibiotics were more effective at the 3- and 7-day time points than vancomycin.

Vancomycin may be less effective for endocarditis because of the need for prolonged high levels of bactericidal antibiotics. The fact that vancomycin was less rapidly bactericidal in vitro than Nafcillin is consistent with our concern that vancomycin may be less effective than Nafcillin for treating this infection.

Hemodialysis-dependent patients with MSSA bacteremia treated with vancomycin are at a higher risk of experiencing treatment failure than are those receiving cefazolin. In the absence of patient specific circumstances (e.g., allergy to β-lactams), vancomycin should not be continued beyond empirical therapy for hemodialysis-dependent patients with MSSA bacteremia.

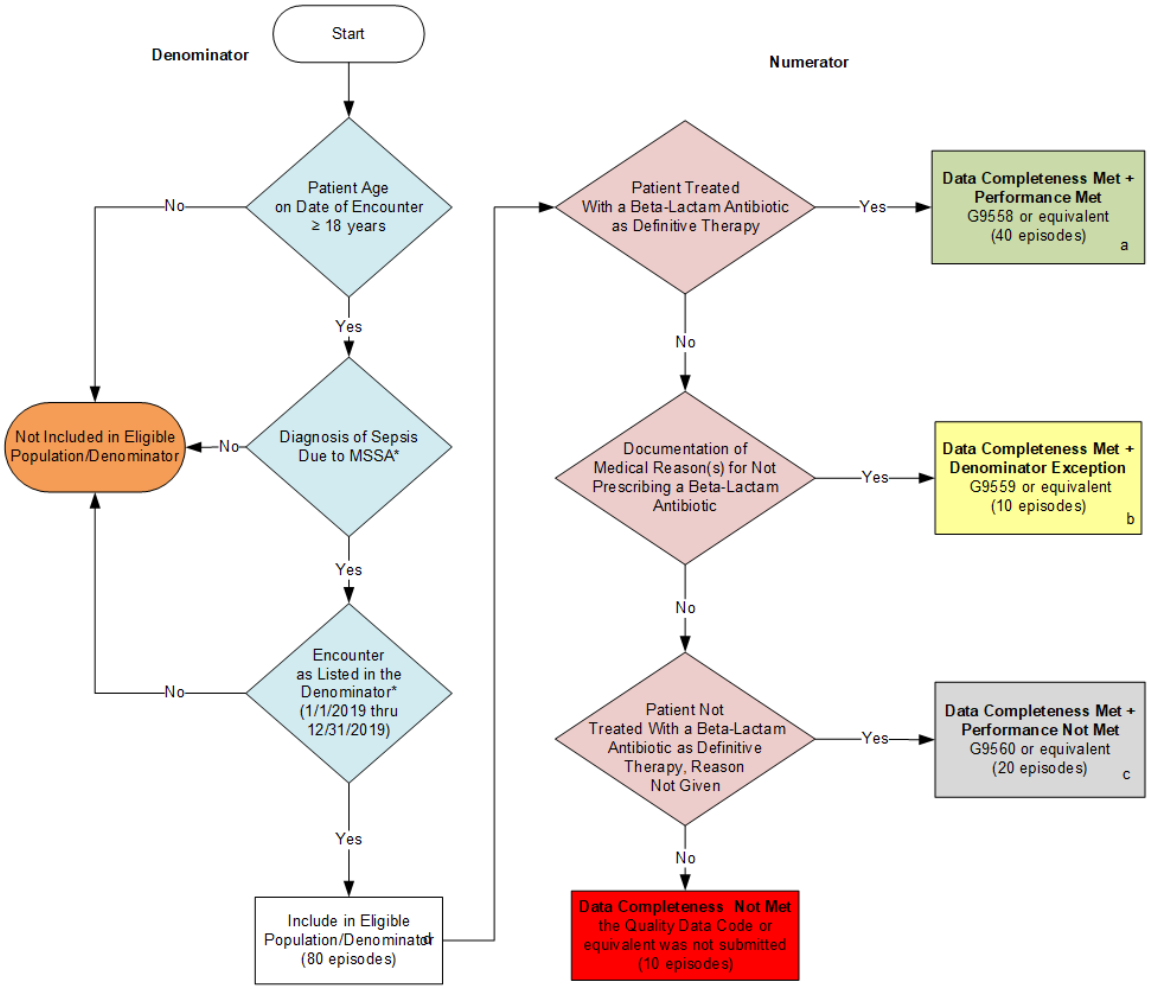
Nafcillin was superior to vancomycin in preventing bacteriologic failure (persistent bacteremia or relapse) for methicillin-susceptible S. aureus (MSSA) bacteremia. Duration of antistaphylococcal therapy was not associated with relapse, but type of antibiotic therapy was. Nafcillin was superior to vancomycin in efficacy in patients with MSSA bacteremia.

Our data suggest that vancomycin treatment adversely affects outcome in patients with methicillin-susceptible Staphylococcus aureus bacteremia (MSSA-B). Therefore, our study supports the view that vancomycin treatment should be avoided in patients with MSSA-B when the use of beta-lactam antibiotics is possible.

The results support the findings of other clinical series in suggesting that vancomycin is inferior to beta-lactam therapy for methicillin-susceptible Staphylococcus aureus (MSSA) and confirms this for injection drug users (IDUs) with MSSA infective endocarditis (IE).

This study suggests that patients with MSSA bacteremia should receive Nafcillin or Cefazolin as soon as the pathogen is definitively identified by culture since there was a 69% lower risk of death in those patients who were switched from vancomycin. Thus, these results imply that clinicians should not continue vancomycin for dosing scheduling convenience, as any benefits from simplified dosing schedules would be greatly outweighed by the survival benefits of switching to Nafcillin or Cefazolin.

2019 Clinical Quality Measure Flow for Quality ID #407: Appropriate Treatment of Methicillin-Susceptible Staphylococcus Aureus (MSSA) Bacteremia



SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a=40 episodes) + Denominator Exception (b=10 episodes) + Performance Not Met (c=20 episodes) = 70 episodes = **87.50%**

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

Performance Rate=

Performance Met (a=40 episodes) = 40 episodes = **66.67%**

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

*See the posted Measure Specification for specific coding and instructions to submit this measure.

NOTE: Submission Frequency: Episode

v3

2019 Clinical Quality Measure Flow Narrative for Quality ID #407: Appropriate Treatment of Methicillin-Susceptible Staphylococcus Aureus (MSSA) Bacteremia

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specifications.

1. Start with Denominator
2. Check Patient Age:
    a. If Patient Age on Date of Encounter is greater than or equal to 18 Years equals No, do not include in Eligible Population. Stop Processing.
    b. If Patient Age on Date of Encounter is greater than or equal to 18 Years equals Yes, proceed to check Patient Diagnosis.
3. Check Patient Diagnosis:
    a. If Diagnosis of Sepsis Due to MSSA equals No during the measurement period, do not include in Eligible Population. Stop Processing.
    b. If Diagnosis of Sepsis Due to MSSA equals Yes during the measurement period, proceed to check Encounter Performed.
4. Check Encounter Performed:
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If Encounter as Listed in the Denominator equals Yes, include in Eligible Population
5. Denominator Population:
    a. Denominator Population is all Eligible Episodes in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 episodes in the Sample Calculation.
6. Start Numerator
7. Check Patient Treated With a Beta-Lactam Antibiotic as Definitive Therapy:
    a. If Patient Treated With a Beta-Lactam Antibiotic as Definitive Therapy equals Yes, include in Data Completeness Met and Performance Met.
    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 40 episodes in Sample Calculation.
    c. If Patient Treated With a Beta-Lactam Antibiotic as Definitive Therapy equals No, proceed to check Documentation of Medical Reason(s) for Not Prescribing a Beta-Lactam Antibiotic.
8. Check Documentation of Medical Reason(s) for Not Prescribing a Beta-Lactam Antibiotic:
    a. If Documentation of Medical Reason(s) for Not Prescribing a Beta-Lactam Antibiotic equals Yes, include in Data Completeness Met and Denominator Exception.

b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 10 episodes in the Sample Calculation.

c. If Documentation of Medical Reason(s) for Not Prescribing a Beta-Lactam Antibiotic equals No, proceed to check Patient Not Treated With a Beta-Lactam Antibiotic as Definitive Therapy, Reason Not Given.

9. Check Patient Not Treated With a Beta-Lactam Antibiotic as Definitive Therapy, Reason Not Given:

   a. If Patient Not Treated With a Beta-Lactam Antibiotic as Definitive Therapy, Reason Not Given equals Yes, include in Data Completeness and Performance Not Met.

   b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 20 episodes in the Sample Calculation.

   c. If Patient Not Treated With a Beta-Lactam Antibiotic as Definitive Therapy, Reason Not Given equals No, proceed to check Data Completeness Not Met.

10. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 episodes have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a=40 episodes) + Denominator Exception (b=10 episodes) + Performance Not Met (c=20 episodes) = 70 episodes = **87.50%**

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

Performance Rate=

Performance Met (a=40 episodes) = 40 episodes = **66.67%**

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