

Demystifying Sepsis

Core Measures

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Financial Disclosures

- None

Who are we?

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Rural EM Podcast

- Today's topic will be published this month
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- These slides will be posted on our site RuralEM.org
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Objectives

- Discuss the following:
 - How to avoid common pitfalls for sepsis core measures
 - Improve charting to meet the core measures
 - Review common myths about the core measures

This lecture is NOT:

- A discussion of sepsis management
- A discussion of the issues with the core measures

Overview of the sepsis core measures

- The measures are “all or nothing”
 - If you miss one part of the measure it is recorded as failed
- Core measures separated into 3-hour bundle and a 6-hour bundle
- There are separate measures for severe sepsis and septic shock

Severe Sepsis Measures

- MUST be completed within 3 hours
 - Measure serum lactate
 - Obtain blood cultures prior to antibiotics
 - Administer antibiotics
- MUST be completed within 6 hours
 - Repeat serum lactate if initial lactate is > 2

Septic Shock Measures

- MUST be completed in 3 hours
 - Measure serum lactate
 - Obtain blood cultures prior to antibiotics
 - Administer antibiotics
 - Resuscitation with 30 mL/kg crystalloid fluid
- MUST be completed in 6 hours
 - Repeat lactate if > 2
 - Repeat volume status and tissue perfusion assessment
 - Vasopressor administration if hypotension persists during first hour after fluid resuscitation

Myth #1:

- ALL septic patients need to meet these requirements!
- Reality:
 - Only applies to severe sepsis and septic shock
 - This does not apply to simple sepsis

Myth #2:

- Myth: ALL sepsis patient must receive 30 mL/kg bolus
- Reality: This measure only applies to:
 - Severe sepsis WITH hypotension
 - Septic shock

Definitions

- Severe Sepsis
- Septic Shock

Severe Sepsis

- Sepsis: 2 SIRS criteria plus infection
- Severe sepsis: sepsis PLUS one of the following
 - Lactate > 2
 - Evidence of organ dysfunction
 - Systolic blood pressure < 90 mmHg or MAP < 65 mmHg
 - >40 mmHg decrease in SBP from baseline
 - Acute respiratory failure
 - Creatinine > 2.0
 - Urine output < 0.5 mL/kg/hour for 2 hours
 - Total bilirubin > 2 mg/dl
 - Platelet count < 100,000
 - INR > 1.5 or aPTT > 60 sec

What doesn't count?

- The end organ dysfunction and SIRS criteria **MUST** be a result of the infection!
- Exclusions to these criteria:
 - The findings are normal for the patient
 - The findings are due to a chronic condition
 - The findings are due to a medication

Examples of exclusion for organ dysfunction

- Chronic heart failure causing hypotension
- Chronic kidney disease or end stage renal disease
- Acute blood loss causing hypotension
- Abnormal coagulation studies due to medication
- Thrombocytopenia due to chemo
- A-fib causing tachycardia
- Seizure NOT related to the infection causing elevated lactate
- Hypotension during surgery is NOT to be used
- SIRS criteria due to artificial interventions such as vent rate of 24

Septic Shock Definition

- If the provider documents septic shock, then the septic shock measures are triggered.
- If septic shock isn't documented, then one of the following two criteria must be met:
 - Severe sepsis AND persistent hypotension after fluid bolus
 - Severe sepsis AND lactate ≥ 4 .

Septic Shock Definition

- TIP: Do not document septic shock unless they are hypotensive *after* fluids or their lactate is ≥ 4 !

Myth #3:

- Myth: Many influenza patients meet the criteria for the sepsis measures
- Reality: viral infections are excluded from these measures!

Other exclusions for severe sepsis

- Viral infection
- Fungal infection
- Parasitic infection
- Erroneous values such as incorrect vital signs
- Bacteremia or septicemia alone does not meet criteria for severe sepsis!

Take home points

- Sepsis alone doesn't trigger the sepsis measures!
 - Patient's must have severe sepsis OR septic shock!

Take home points

- If any of the SIRS criteria, lactic acid, or findings that suggest end organ damage are NOT from infection, document the reason!
 - Such as anticoagulant use, chronic kidney disease, chronic heart failure, atrial fibrillation, seizures due to non-infectious cause, etc.

Let's discuss specifics

- Presentation time
- 3-hour bundle
- 6-hour bundle

Presentation time

- Throughout the SEP-1 document, time is measured from the *Presentation Time*
- Severe sepsis presentation time is “the earliest time at which the final criterion was met to establish the presence of severe sepsis.”
- Septic shock presentation time is “the earliest time at which the final criterion was met to establish the presence of septic shock.”
- If patient was transferred from another hospital or acute surgical center, they are not to be included in this core measure!

Myth #4

- Myth: The time is measured from arrival to the hospital or emergency department
- Reality: The arrival time is only used when the condition was present on arrival!
- If severe sepsis or septic shock is not present on arrival, the time used is when the criteria for severe sepsis/shock are met
- Chart the time the criteria was met if this was not present on arrival!

3 hour bundle

- MUST be completed in 3 hours
 - Measure serum lactate
 - Obtain blood cultures prior to antibiotics
 - Administer antibiotics
 - Resuscitation with 30 mL/kg crystalloid fluid

Serum lactate measurements

- Lactate must be drawn within 6 hours prior to presentation through 3 hours following presentation
 - Outpatient labs count if drawn within 6 hours of presentation!
- If lactate is > 2 , level MUST be repeated within 6 hours.
- Remember, if lactate is > 4 it is considered septic shock
- Lab documentation of specimen drawn time is sufficient
- Tip: if the elevated lactate is NOT due to infection, document the reason!

Myth #5

- Myth: If lactate was not drawn the measures were not met
- Reality: A documented ATTEMPT to collect the lactate is acceptable
 - Chart the reason why attempt failed, such as patient was too dehydrated, specimen was contaminated during or after the draw, etc. Also, if there is an issue with the lab and no result was obtained but the lactate was drawn, this also counts as an attempt.
 - The charting can be by nursing or the physician, but a time and date must be included.
 - The time can be from charting indicating time drawn/attempted or the time the specimen was received by the lab.

3-Hour Bundle

- MUST be completed in 3 hours
 - Measure serum lactate
 - **Obtain blood cultures prior to antibiotics**
 - Administer antibiotics
 - Resuscitation with 30 mL/kg crystalloid fluid

Blood Cultures

- Timing: 24 hours before presentation to 3 hours after presentation of severe sepsis or septic shock
- Blood cultures must be obtained prior to antibiotic administration
- If patient received IV/IO antibiotics within 24 PRIOR to presentation then the timing is 24 hours PRIOR to antibiotic administration through 3 hours after presentation of severe sepsis

Myth #6

- Myth: If blood cultures not drawn, the core measure is failed
- Reality: An attempt at obtaining the culture meets the requirements!
- As with the lactate, chart the attempt and the reason it failed. Make sure the charting includes the time of the attempt

Myth #7

- Myth: Core measure failed if cultures drawn after antibiotics
- Reality: There are specific reasons that are acceptable
 - Surgical patients who received prophylactic antibiotics within 24 hours before severe sepsis was identified
 - Antibiotics started in the hospital for an infection within 24 hours before severe sepsis was identified and blood culture was drawn after these antibiotics
 - Antibiotics started prior to hospital arrival within 24 hours before severe sepsis was identified and blood culture was drawn after the pre-hospital antibiotics
 - Physician/APN/PA note stating that delaying antibiotics for blood cultures would be detrimental to the patient

3-Hour Bundle

- MUST be completed in 3 hours
 - Measure serum lactate
 - Obtain blood cultures prior to antibiotics
 - **Administer antibiotics**
 - Resuscitation with 30 mL/kg crystalloid fluid

Administration of antibiotics

- IV antibiotics should be administered 24 hours prior to or 3 hours following the presentation of severe sepsis

Myth #8

- Myth: If antibiotics are not administered intravenously, the core measure is failed
- Reality: Although the measure states IV antibiotics must be administered, if IV access cannot be obtained IM or IO is acceptable
- Tip: The antibiotic name, route, date, and time must be included in the record
- Physician order is not sufficient for this measure

Clostridium difficile

- This is the only condition in the core measures that allows for PO antibiotics

Antibiotics

- There are tables for single coverage and double coverage antibiotics
 - These correspond to the typical treatments for infections so we won't cover these
 - If you are giving two antibiotics give the fastest antibiotic first because both antibiotics have to be started within 3 hours

3-Hour Bundle

- MUST be completed in 3 hours
 - Measure serum lactate
 - Obtain blood cultures prior to antibiotics
 - Administer antibiotics
 - **Resuscitation with 30 mL/kg crystalloid fluid**

Crystalloid fluid resuscitation

- 30 mL/kg bolus within the first 3 hours
- ONLY required if hypotensive or septic shock
- Fluids given within 6 hours prior to arrival count!
 - Make sure you document fluid from EMS, nursing home, etc.
 - Crystalloids must be given at a rate greater than 125 ml/hr to count
- Fluid used to dilute medication is also counted!
 - Remember to include the fluid in your antibiotics!
- You can give 10% less and it still is acceptable
 - Example: 70 kg patient the bolus is 2100 mL. 10% less is 1890 mL, so 2L is acceptable

Crystalloid Fluid Resuscitation

- Remember, the fluid bolus should be given within 3 hours after the initial hypotension time or the septic shock presentation time, whichever is earlier
- Tips:
 - Don't chart septic shock unless there is a lactate > 4 or the patient has persistent hypotension

Myth #9

- Myth: In obese patients we are giving large volumes of crystalloid
- Reality: using ideal body weight when BMI > 30 is acceptable!

6-Hour Bundle

- Must be completed in 6 hours
 - Repeat serum lactate if initial lactate is > 2
 - Repeat volume status and tissue perfusion assessment
 - Vasopressor administration if hypotension persists after fluid

Repeat Lactate

- ONLY recorded if the initial lactate was > 2
- This must be done within 6 hours after severe sepsis presentation
- If an attempt was made this is sufficient but **MUST** be documented

6-Hour Bundle

- Must be completed in 6 hours
 - Repeat serum lactate if initial lactate is > 2
 - **Repeat volume status and tissue perfusion assessment**
 - Vasopressor administration if hypotension persists after fluid

Volume Status Reassessment

- ONLY required if persistent hypotension after fluids or initial lactate ≥ 4
- Must be performed within 6 hours of SEPTIC SHOCK presentation

Volume Status Reassessment

- Reassessment must contain any one of the following three:
 1. Physician/APN/PA documentation indicating the reassessment was completed, such as:
 - “I did the sepsis reassessment.”
 - “I have reassessed tissue perfusion after bolus given.”
 - “I have reassessed the patient’s hemodynamic status.”

Volume Status Reassessment

2. Physician/APN/PA documentation indicating at least 5 of the following 8 parameters were completed.
 - Arterial Oxygen Saturation (pulse ox acceptable)
 - Capillary Refill
 - Cardiopulmonary assessment (at least rate, rhythm, and lung sounds)
 - Peripheral Pulses
 - Shock Index (heart rate/SBP)
 - Skin color or condition
 - Urine Output
 - Vital Signs

Volume Status Reassessment

3. Documentation of one of the following:
 - Central Venous Pressure
 - Central Venous Oxygen Saturation
 - Echocardiogram or cardiac ultrasound
 - Fluid challenge
 - Passive leg raise

Volume Status Reassessment

- Tip: Chart “I reassessed tissue perfusion after bolus and it was improved/unchanged/worsened.”
 - Easier than charting the other options for reassessment
- Always include date and time (military)
- Reassessment must be within the first six hours

6-Hour Bundle

- Must be completed in 6 hours
 - Repeat serum lactate if initial lactate is > 2
 - Repeat volume status and tissue perfusion assessment
 - **Vasopressor administration if hypotension persists after fluid**

Vasopressor Administration

- This only applies to patients with persistent hypotension AFTER 30 mL/kg bolus in the first 6 hours
- Acceptable pressors are:
 - Norepinephrine
 - Epinephrine
 - Phenylephrine
 - Dopamine
 - Vasopressin
- MUST be IV or IO
- Tip: chart date and time pressors were started and response

Summary

- The CMS Sepsis Core Measures ONLY apply to severe sepsis and septic shock. It does not include simple sepsis!
- Severe sepsis is defined as sepsis with lactate > 2 or evidence of end organ dysfunction
 - Tip: end organ dysfunction or elevated lactate from a chronic condition, medication, or if it is at baseline for the patient does NOT count toward severe sepsis!
- Septic shock is defined as severe sepsis with persistent hypotension after fluid bolus, severe sepsis with lactate > 4 , OR if the provider charts “septic shock.”

Summary

- DO NOT use the words “septic shock” unless
 - Patient has severe sepsis and persistent hypotension
 - Patient has severe sepsis and lactate ≥ 4

Summary

- 3 hour bundle
 - Initial lactate measurement
 - Blood cultures before antibiotics
 - IV antibiotic administration
 - 30 mL/kg crystalloid bolus (ONLY if septic shock, hypotension, or lactate ≥ 4)
- Tips
 - Attempt to draw lactate or blood cultures meets core measure requirements
 - If patient has rapid declining status, don't wait for cultures to give antibiotics! As long as you chart the reason you will still meet core measures
 - Don't give 30 mL/kg of fluid if no septic shock, hypotension, or lactate is ≥ 4 !
 - For patients with BMI > 30 , use ideal body weight!
 - 90% of the bolus is sufficient
 - The bolus includes the fluid in medications and fluids from 6 hours prior to presentation!

Summary

- 6 hour bundle
 - Repeat lactate ONLY if lactate is > 2
 - Vasopressors ONLY if hypotension is persistent after fluids
 - Repeat volume status and tissue perfusion assessment after fluids
- Tips
 - Have your electronic medical record reflex any lactate > 2 to repeat in less than 3 hours
 - Document “After fluid bolus I reassessed the fluid status and it is improved/unchanged/worsening.”

Final Thoughts

- Remember, presentation to the Emergency Department, severe sepsis presentation time, and septic shock presentation times can all be different!
 - If patient does NOT have severe sepsis or septic shock on arrival, you MUST chart when these began!

Final Thoughts

- If there is a reason you didn't follow a specific measure, chart your rationale as this will often prevent you from failing the core measure!

Final Thoughts

- It is important to have a team member who understands these points to help prevent reporting cases as failing core measures when they were actually meeting requirements!

Final Thoughts

- Refusal of care
 - Patient can refuse individual treatments, procedures, or leave against medical advice
 - You just need to document the refusal to meet the core measures
 - This also applies to comfort measures and palliative care

References

- Severe Sepsis guidelines can be found on the CMS approved site [QualityNet.org](https://www.qualitynet.org)
 - Located in the specifications manual section