

# SEPSIS MANAGEMENT

WakeMed has made improving sepsis care a priority. Sepsis contributes to nearly one in two hospital deaths. Improving sepsis survival rates requires early recognition of symptoms and aggressive treatment. "Similar to poly-trauma, AMI or stroke, the speed and appropriateness of therapy administered in the initial hours after sepsis is suspected are likely to influence outcome" cited the Surviving Sepsis Campaign (SSC).

**Identified Problems:** Early detection and treatment care bundles have been shown to reduce sepsis-related mortality. Nurse driven protocols are in place both in the ED and inpatient floors to facilitate early detection and get "the ball rolling". Breakdown tends to happen when providers input individualized orders and do not utilize the sepsis ordersets. In audit, if we miss one component of the multi-step measure, we fail the measure.

In addition to utilizing the order sets, we also need to reassess patients and readdress treatment plans frequently. Reassessment occurs thru serial lactates, hemodynamic measurements (CVP, ScVO2, IVC, PLR), and / or repeat physical assessment (.sepsisfocusedexam). It is the responsibility of the admitting provider to have a designated plan in place for reassessment (i.e. obtain stat limited echo to obtain IVC distensibility and SV assessment via PLR), and upon results adjust the treatment plan if indicated (i.e. adequate volume resuscitation with IVC distensibility and SV assessment via PLR, no longer fluid responsive, continue pressors to maintain MAP > 65). Once the e-ICU is aware of a sepsis patient, the e-ICU nurses will help facilitate bundle compliance, including paging a provider if a physical assessment is required.

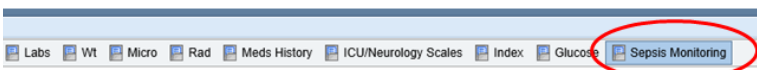
**Proposed Solutions:**

- Encourage ED providers to utilize their "ED Sepsis Panel"
- Encourage rapid collection of labs and cultures
- Encourage urgent administration of antibiotics
- Routinely utilize our "Severe Sepsis Panel"
- Document a plan for reassessment of septic shock patients with 2 out of 4 measurements OR a repeat physical exam
- There is a smart phrase for a repeat physical exam. Please utilize it as certain physical exam components are required (.sepsisfocusedexam)

This is a repeat volume status and tissue perfusion assessment.

Exam:  
 Vital signs: BP 90/55 mmHg | Pulse 89 | Temp(Src) 97.7 °F (36.5 °C) (Axillary) | Resp 23 | Ht 1.549 m (5' 1") | Wt 62.5 kg (137 lb 12.6 oz) | BMI 26.05 kg/m2 | SpO2 97%  
 Cardiopulmonary exam: Heart sounds are {Heart Sounds:24638::"normal"}, and lung auscultation shows {Lung Sounds:24638::"clear lungs bilaterally"}  
 Cap refill: {Capillary Refill:24640} seconds  
 Peripheral pulses: Patient has {Peripheral Pulses:24641::"normal"} pulses peripherally  
 Skin: Patient's skin is {Skin condition:24642::"warm and dry"}

- e-ICU will be performing "sepsis rounds" to assist in meeting our serial labs, volume measurements and repeat assessment requirements. You can utilize the "Sepsis Monitoring" toolbar in EPIC to visualize the progress of your septic patient in one flow sheet.



## DEFINITIONS

### SIRS (2 Required)

- Temp > 38 or < 36
- HR > 90
- RR > 20
- WBC > 12,000 or < 4,000 or > 10% bands

### SEPSIS

SIRS + suspected source of infection (must be documented by provider)

### SEVERE SEPSIS (Sepsis + 1 criteria "thought to be due to infection")

- Sepsis induced hypotension (SBP < 90, MAP < 65 or SBP drop > 40)
- Lactate > 2
- Urine output < 0.5 mL/kg/hr for > 2 hrs despite adequate fluid resuscitation
- Acute lung injury PaO2/FiO2 < 250(w/out PNA) or < 200(w/ PNA)
- Creatinine increase > 0.5 mg/dL above baseline
- Bilirubin > 2 mg/dL
- Platelet Count < 100,000
- Coagulopathy INR > 1.5 or PTT > 80

### SEPTIC SHOCK (Severe Sepsis + 1 criteria)

- Hypotension persists after adequate fluid resuscitation (SBP<90 or MAP<65)
- Lactate > 4
- Provider documentation of shock

TREATMENT BUNDLES	SEVERE SEPSIS	SEPTIC SHOCK
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|----------------|---|---|
| by 3 hour mark | <ul style="list-style-type: none"> <li>• Initial lactate level</li> <li>• Blood cultures prior to antibiotics</li> <li>• Broad spectrum antibiotics administered</li> <li>• If hypotensive (SBP &lt; 90, MAP &lt; 65 or SBP drop &gt;40), resuscitation with 30 mL/kg crystalloid fluids</li> </ul> | <ul style="list-style-type: none"> <li>• Initial lactate level</li> <li>• Blood cultures prior to antibiotics</li> <li>• Broad spectrum antibiotics administered</li> <li>• Resuscitation with 30 mL/kg crystalloid fluids</li> </ul> |
|----------------|---|---|

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| by 6 hour mark | <ul style="list-style-type: none"> <li>• Repeat lactate level (if initial level &gt; 2)</li> <li>• Based upon results, continue serial lactates, provide additional fluid resuscitation, etc.</li> </ul> | <ul style="list-style-type: none"> <li>• Physical exam to reassess volume status and perfusion (.sepsisfocusedexam) OR</li> <li>• 2 of 4 measurements                             <ul style="list-style-type: none"> <li>- CVP (8-12)</li> <li>- ScvO2 (&gt;70)</li> <li>- Passive leg raise</li> <li>- IVC measurement</li> </ul> </li> </ul> |
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MEASUREMENTS 2 OF 4 REQUIRED	INTERPRETATION
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|-------|--|
| CVP   | < 8 = fluid responsive (requires central line)   |
| ScvO2 | < 70 = fluid responsive (requires central line)  |
| IVC   | Obtained w/ limited echo<br>Distensibility Index=Dmax-Dmin/Daverage<br>DI > 12% = fluid responsive                       |
| PLR   | Obtained w/ limited echo, requires nursing assistance<br>Assess SV before and after PLR<br>SV Δ > 12% = fluid responsive |