

Staging Sepsis for the Adult Patient: Medicine and Surgery Physician



Northwell
HealthSM

Sepsis Continuum

SIRS = 2 or more clinical criteria, resulting in Systemic Inflammatory Response Syndrome

Sepsis = SIRS + proven/suspected infection

Severe Sepsis = Sepsis + acute organ dysfunction

Septic Shock = Severe Sepsis + refractory hypotension

SIRS/Sepsis Defined

Manifested by a documented or suspected infection with two or more SIRS criteria:

Temperature $> 38.3^{\circ}\text{C}$ (101°F) or $< 36^{\circ}\text{C}$ (96.8°F)

Heart rate > 90 beats/min

Respiratory rate > 20 breaths/min

WBC $> 12,000/\text{mm}^3$, or $< 4,000/\text{mm}^3$ or more than 10% immature neutrophils or bands

Severe Sepsis

Sepsis with organ dysfunction. Examples include:

- New onset renal insufficiency
- Alteration in mental status
- Lactate >2 and <4
- Coagulopathy/thrombocytopenia
- Hyperbilirubinemia

Septic Shock

- Sepsis with refractory hypotension requiring vasoactive agents **or** lactate ≥ 4.0 mmol/L despite adequate fluid resuscitation

Stage	Definition	SIRS Criteria
Sepsis	Suspected infection + 2 or more SIRs criteria	T-38.3°C (101°F) or T-36°C (96.8°F) HR: > 90 RR: > 20 WBC > 12,000 or < 4,000
Severe Sepsis	Suspected or documented infection + organ dysfunction	T-38.3°C (101°F) or T-36°C (96.8°F) HR: > 90 RR: > 20 WBC > 12,000 or < 4,000
Septic Shock	Severe Sepsis + persistent hypotension that does not respond to appropriate fluid resuscitation	T-38.3°C (101°F) or T-36°C (96.8°F) HR: > 90 RR: > 20 WBC > 12,000 or < 4,000

Treating Sepsis

Source control (remove PICC, address gall bladder, etc). Administration of antimicrobials within 180 minutes of recognizing sepsis – broad spectrum to start.

- Draw blood cultures prior to antibiotics, increases the odds of isolating the causative agent(s) allowing tailoring of antibiotic regimens at 72 hrs
- Draw diagnostic lab studies to evaluate for potential organ dysfunction (include lactic acid measurement to screen for severe sepsis/septic shock)

Treating Severe Sepsis

“Empiric crystalloid administration (30mL/kg crystalloid)”.

If lactate is elevated >2 mmol/L, repeat within 6 hours.

Antibiotics within 60 minutes of severe sepsis identification

Treating Septic Shock

- 30 mL/kg crystalloid; if remains hypotensive **norepinephrine** is first line agent
- “Reassess volume status after resuscitation with ultrasound, Central Venous Catheter or other parameters”
- Repeat lactic acid measurement after resuscitation.
- Avoid Dopamine

Sepsis Bundles

Within 3 hours

- Blood cultures (prior to antibiotic)
- Antibiotics (2 antibiotics, first one first!)
- Lactic acid level (at some sites, “lactate VBG” in dark green top is 90% faster, new choice)
- “(if hypotensive or organ dysfunction) 30 mL/kg crystalloid (normal saline, LR,) completed.”
 - **Bolus started within 30 minutes**

Sepsis Bundles

Within 6 hours

- **Repeat Lactic acid level** if first was > 2
- If shock (lactate > 4):
 - Reassess volume status
 - Vasopressors if MAP < 65

Repeat focused exam

If shock: Repeat focused exam (after initial fluid resuscitation) by licensed independent practitioner **(physician/APN/PA only)** including vital signs, cardiopulmonary, capillary refill, pulse, and skin findings.

Proposed Sepsis 3.0 definitions 2016

- Sepsis is **life-threatening** organ dysfunction caused by a dysregulated host response to infection.
- Operationalize with qSOFA
 - Altered mental status
 - Respiratory rate $\geq 22/\text{min}$
 - Systolic blood pressure $\leq 100 \text{ mmHg}$
 - [these are quite similar to our “super sirs” criteria used in the ED algorithm]

New definitions not yet widely adopted. They point out gaps with SIRS and lactate. Our system adheres to the older definitions as does the surviving sepsis campaign.]

Take home messages from Sepsis 3

The qsofa looks very similar to our super sirs and makes good sense for an easier screen outside the ICU, where most of our efforts are focused.

The authors point out that sirs is still useful for identifying infection, though not needed for the definition of sepsis any longer due to its poor performance.

It is based on a retrospective cohort study. Although they validated it in a split study population, we have seen these types of tools come under scrutiny in the past. **Further validation is called for.**