

## Recognizing and Managing Sepsis

Early diagnosis and treatment has been shown to improve patient outcomes and decrease overall mortality from sepsis. *Sepsis* is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. *Septic shock* is a subset of sepsis with circulatory and cellular/metabolic dysfunction associated with a higher risk of mortality (Singer et al., 2016).

### Sequential (Sepsis-Related) Organ Failure Assessment (SOFA) Score (Vincent et al., 1996)

- Provides clinical measures to identify organ dysfunction; these criteria can identify infected patients most likely to develop sepsis.
- Baseline score is assumed to be zero in patients without preexisting organ dysfunction.
- An increase in score of 2 points or more from baseline represents organ dysfunction.
- Higher scores are associated with increased probability of mortality.

Score	0	1	2	3	4
<b>Respiration</b>					
PaO <sub>2</sub> /FiO <sub>2</sub> mm HG (kPa)	≥ 400 (53.3)	< 400 (53.3)	< 300 (40)	< 200 (26.7) with respiratory support	< 100 (13.3) with respiratory support
<b>Coagulation</b>					
Platelets, x 10 <sup>3</sup> /uL	≥ 150	<150	<100	<50	<20
<b>Liver</b>					
Bilirubin, mg/dL (umol/L)	<1.2 (20)	1.2- 1.9 (20 – 32)	2.0- 5.9 (33- 101)	6.0- 11.9 (102 - 204)	>12.0 (204)
<b>Cardiovascular</b>					
Mean arterial pressure (MAP) and vasopressor therapy (ug/kg/min for at least 1 hour)	MAP ≥ 70 mm Hg	MAP < 70 mm Hg	Dopamine < 5 or dobutamine (any dose)	Dopamine 5.1- 15 <b>OR</b> epinephrine ≤ 0.1 <b>OR</b> norepinephrine ≤ 0.1	Dopamine > 15 <b>OR</b> epinephrine > 0.1 <b>OR</b> norepinephrine > 0.1
<b>Central Nervous System</b>					
Glasgow Coma Scale score	15	13-14	10-12	6-9	<6
<b>Renal</b>					
Creatinine, mg/dL (umol/L)	<1.2 (110)	1.2- 1.9 (110 – 170)	2.0- 3.4 (171- 299)	3.5- 4.9 (300- 440)	>5.0 (440)
Urine output, mL/day				<500	<200

### Quick SOFA (qSOFA) (Singer et al., 2016)

- Provides simple bedside criteria to quickly identify adult patients with suspected infection who are likely to have poor outcomes.
- This screening tool is positive in those with suspected infection and at least 2 of the following criteria:
  - Respiratory rate  $\geq$  22/min
  - Altered mental status
  - Systolic blood pressure  $\leq$  100 mmHg

### The Surviving Sepsis Campaign (SSC) Bundle

The SCC recommends prompt initiation of resuscitation, diagnosis, and treatment of sepsis by instituting the following interventions (Levy, Evans, & Rhodes, 2018):

- Measure lactate level (repeat lactate if initial lactate elevated ( $>2$ mmol/L))
- Obtain blood cultures before administering antibiotics
- Administer broad-spectrum antibiotics
- Begin rapid administration of 30ml/kg crystalloid for hypotension or lactate  $\geq$  4mmol/L
- Apply vasopressors if hypotensive during or after fluid resuscitation to maintain mean arterial pressure  $\geq$  65mm Hg.

### References:

Levy, M.M., Evans, L.E., & Rhodes, A. (2018). *The Surviving Sepsis Campaign Bundle: 2018 Update*. *Critical Care Medicine*, 46(6), 997-1000. <https://doi.org/10.1097/CCM.0000000000003119>

Rhodes, A., Evans, L., Alhazzani, W., Levy, M., Antonelli, M., Ferrer, R., . . . Dellinger, R. (2017). Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Critical Care Medicine*, 45(3), 486-552. doi: 10.1097/CCM.0000000000002255

Singer, M., Deutschman, C., Seymour, C., Shankar-Hari, M., Annane, D., Bauer, M., . . . Angus, D. (2016). The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *Journal of the American Medical Association (JAMA)*, 315(8), 801-810. doi:10.1001/jama.2016.0287

Society of Critical Care Medicine. (April 2015). *Sepsis Campaign Bundles*. Retrieved from <http://www.survivingsepsis.org/Bundles/Pages/default.aspx>

Vincent, J., Moreno, R., Takala, J., Willatts, S., De Mendonca, A., Bruining, H., . . . Thijs, L. (1996). The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction/failure. On behalf of the Working Group on Sepsis-Related Problems of the European Society of Intensive Care Medicine. *Intensive Care Medicine*, 22(7), 707-710. doi=10.1007/BF01709751