

Sepsis

Definitions of Sepsis Disease States

Systemic Inflammatory Response Syndrome (SIRS). The systemic inflammatory response to a wide variety of severe clinical insults, manifested by 2 or more of the following conditions:

1. Temperature $> 38^{\circ}\text{C}$ or $< 36^{\circ}\text{C}$
2. Heart rate > 90 bpm
3. Respiratory rate > 20 breaths/min or $\text{Paco}_2 < 32$ mm Hg
4. White blood cell count $> 12 \times 10^3/\mu\text{L}$ or $< 4 \times 10^3/\mu\text{L}$, or $> 10\%$ immature (band) forms

Sepsis. The systemic inflammatory response to infection. The clinical manifestations would include 2 or more of the following conditions as a result of a documented infection:

1. Temperature $> 38^{\circ}\text{C}$ or $< 36^{\circ}\text{C}$
2. Heart rate > 90 bpm
3. Respiratory rate > 20 breaths/min or $\text{Paco}_2 < 32$ mm Hg
4. White blood cell count $> 12 \times 10^3/\mu\text{L}$ or $< 4 \times 10^3/\mu\text{L}$ or $> 10\%$ immature (band) forms

Severe sepsis/SIRS Sepsis (SIRS) associated with *organ dysfunction, hypoperfusion, or hypotension*. Hypoperfusion and perfusion abnormalities may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status.

Sepsis (SIRS)-induced hypotension. A systolic blood pressure < 90 mm Hg or a reduction of ≥ 40 mm Hg from baseline in the absence of other causes of hypotension.

Septic shock/SIRS shock. A subset of severe sepsis (SIRS) and defined as sepsis (SIRS)-induced hypotension despite adequate fluid resuscitation along with presence of perfusion abnormalities that may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status. Patients receiving inotropic or vasopressor agents may no longer be hypotensive by the time they manifest hypoperfusion abnormalities or organ dysfunction, yet they would still be considered to have septic (SIRS) shock.

Multiple organ dysfunction syndrome (MODS). Presence of altered organ function in an acutely ill patient such that homeostasis cannot be maintained without intervention.

Diagnostic Criteria for Sepsis

Infection (documented or suspected) and some of the following:

General variables

Fever (core temperature $> 38.3^{\circ}\text{C}$)

Hypothermia (core temperature $< 36^{\circ}\text{C}$)

Heart rate > 90 bpm or > 2 SD above normal value for age

Tachypnea

Altered mental status

Significant edema or positive fluid balance (> 20 mL/kg over 24 hr)

Hyperglycemia (plasma glucose > 120 mg/dL or 7.7 mmol/L) in the absence of diabetes

Inflammatory variables

Leukocytosis (WBC count $> 12 \times 10^3/\mu\text{L}$)

Leukopenia (WBC count $< 4 \times 10^3/\mu\text{L}$)

Normal WBC count with 10% immature (band) forms

Plasma C-reactive protein > 2 SD above normal value

Hemodynamic variables

Arterial hypotension (SBP < 90 mm Hg, or an SBP decrease > 40 mm Hg in adults or < 2 SD below normal for age)

Mixed venous oxygen saturation $> 70\%$

Cardiac index > 3.5 L/min/m²

Organ dysfunction variables

Arterial hypoxemia ($\text{Pao}_2/\text{Fio}_2 < 300$) the comparison of arterial partial pressure of oxygen (PaO_2) with inspired fractional concentration of oxygen (FiO_2). Simply put, the P/F ratio is a comparison of the amount of oxygen given to a patient with the amount of oxygen actually entering the patient's blood stream. The higher the P/F ratio, the better the gas exchange. The normal measurement is around 500 mm Hg.

Acute oliguria (urine output < 0.5 mL/kg/hr)

Creatinine increase > 0.5 mg/dL

Coagulation abnormalities (INR > 1.5 or aPTT > 60 sec)

Ileus (absent bowel sounds)

Thrombocytopenia (platelet count $< 100 \times 10^3/\mu\text{L}$)

Hyperbilirubinemia (plasma total bilirubin > 4 mg/dL or 70 mmol/L)

Tissue perfusion variables

Hyperlactatemia (> 1 mmol/L)

Decreased capillary refill or mottling

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