Surviving Sepsis Campaign 2016

Article

- *Rhodes A, et al. Surviving Sepsis Campaign: International guidelines for management of sepsis and septic shock. Crit Care Med March 2017*.

Definitions

- Uses the Sepsis-3 definitions for sepsis/septic shock published in *JAMA* 2016.

Initial Resuscitation

- *2012 Recommendations*
  - Protocolized, quantitative resuscitation of patients with sepsis-induced tissue hypoperfusion. Goals in first 6 hours:
    - CVP
    - MAP
    - UO
    - ScvO2
  - Normalize lactate
- *2016 Recommendations*
  - Begin resuscitation immediately (Best Practice Statement)
  - Recommend least 30 ml/kg of crystalloid fluid in the first 3 hours for sepsis-induced hypoperfusion (strong recommendation, low quality of evidence)
  - Additional fluids be guided by frequent assessment of hemodynamic status (Best Practice Statement)
  - Suggest dynamic over static variables be used to predict fluid responsiveness, where available (weak recommendation, low quality of evidence)
  - Recommend an initial target MAP of 65 mm Hg in patients with septic shock requiring vasopressors (strong recommendation, moderate quality of evidence)
  - Suggest guiding resuscitation to normalize lactate in patients with elevated lactate levels as marker of tissue hypoperfusion (weak recommendation, low quality of evidence)

Diagnosis

- *2012 Recommendations*
  - Cultures as clinically appropriate before antimicrobial therapy if no significant delay (> 45 minutes) in the start of antimicrobials

    - At least 2 sets of blood cultures be obtained before antimicrobial therapy with at least 1 drawn percutaneously and 1 drawn through each vascular device unless device recently placed.
- *2016 Recommendations*
    - Recommend that appropriate routine microbiologic cultures (including blood) be obtained before starting antimicrobial therapy in patients with suspected sepsis or septic shock if doing so results in no substantial delay in the start of antimicrobials (Best Practice Statement)

Antimicrobial Therapy

- *2012 Recommendations*
    - Administration of effective IV antimicrobials within the first hour of recognition for septic shock (grade 1B) and severe sepsis without septic shock (grade 1C)
    - Initial empiric therapy anti-infective therapy of one or more drugs that have activity against all likely pathogens and that penetrate in adequate concentrations into tissues presumed to be the source of sepsis
    - Assess for daily de-escalation
    - Procalcitonin or similar biomarkers to assist the clinician in the discontinuation of empiric antibiotics
    - Combined empiric therapy for neutropenic patients with severe sepsis and for patients with difficult-to-treat, MDR bacterial pathogens
    - Duration 7 to 10 days
- *2016 Recommendations*
    - Recommend administration of IV antimicrobials be initiated as soon as possible after recognition and within 1 hour for both sepsis and septic shock (strong recommendation, moderate quality of evidence)
    - Recommend empiric broad-spectrum therapy with 1 or more antimicrobials for patients presenting with sepsis or septic shock to cover all likely pathogens (strong recommendation, moderate quality of evidence)
    - Recommend antimicrobial therapy is narrowed once pathogen identification and sensitivities are established (BPS)
    - Recommend dosing strategies of antimicrobials be optimized based on accepted pharmacokinetic/pharmacodynamics principles and specific drug properties in patients with sepsis or septic shock (BPS)
    - Suggest empiric combination therapy aimed at the most likely bacterial pathogen for the initial management of septic shock (weak recommendation, low quality of evidence)
    - Recommend against combination therapy for routine treatment of neutropenic sepsis/bacteremia (strong recommendation, moderate quality of evidence)

    - Recommend de-escalation with discontinuation of combination therapy within the first few days in response to clinical improvement and or evidence of infection resolution (BPS)
    - Suggest duration of treatment 7 to 10 days (weak recommendation, low quality of evidence)

Source Control

- *2012 Recommendations*
    - A specific anatomic diagnosis of infection requiring consideration for emergent source control be sought and diagnosed or excluded as rapidly as possible, and intervention be undertaken for source control within the first 12 hours after the diagnosis is made
    - When source control in a severely septic patient is required, the effective intervention associated with the least physiologic insult should be used
    - If intravascular devices are a possible source of severe sepsis or septic shock, the should be removed promptly after other vascular access has been taken.
- *2016 Recommendations*
    - Recommend that a specific anatomic diagnosis of infection requiring emergent source control should be identified or excluded as rapidly as possible in patients with sepsis or septic shock, and that any required source control intervention be implemented as soon as medically and logistically practical (BPS)
    - Recommend prompt removal of intravascular access devices that are a possible source of sepsis or septic shock after other vascular access has been established (BPS)

Fluid Therapy

- *2012 Recommendations*
    - Crystalloids as initial fluid of choice in resuscitation of severe sepsis and septic shock
    - No HES
    - Albumin in the fluid resuscitation of severe sepsis or septic shock when patients require substantial amounts of crystalloids
    - Initial fluid challenge in patients with sepsis-induced tissue hypoperfusion with suspicion of hypovolemia to achieve a minimum of 30 ml/kg
    - Fluid challenge technique be applied wherein fluid administration is continued as long as there is hemodynamic improvement either based on dynamic or static variables.
- *2016 Recommendations*
    - Recommend that a fluid challenge technique be applied where fluid administration is continued as long as hemodynamic factors continue to improve (BPS)

- Recommend crystalloids as the fluid of choice for initial resuscitation and subsequent intravascular volume replacement (strong recommendation, moderate quality of evidence)
- Suggest either balanced crystalloids or saline for fluid resuscitation (weak recommendation, low quality of evidence)
- Suggest albumin in addition to crystalloids for initial resuscitation and subsequent intravascular volume replacement when patients require substantial amounts of crystalloids (weak recommendation, low quality of evidence)
- Recommend against HES (strong recommendation, high quality of evidence)

Vasoactive Medications

- *2016 Recommendations*
  - Recommend NE as the first choice vasopressor (strong recommendation, moderate quality of evidence)
  - Suggest adding either vasopressin (up to 0.03 U/min) (weak recommendation, moderate quality of evidence) or epinephrine (weak recommendation, low quality of evidence) to NE with intent of raising MAP to target
  - Suggest using dopamine as an alternative vasopressor agent to NE in only selected patients (low risk of tachyarrhythmia's, absolute or relative bradycardia) (weak recommendation, low quality of evidence)
  - No low-dose dopamine (strong recommendation, high quality of evidence)
  - Suggest using dobutamine in patients who show evidence of persistent hypoperfusion despite adequate fluid loading and the use of vasopressor agents (weak recommendation, low quality of evidence)
  - Suggest that all patients requiring vasopressors have an arterial catheter (weak recommendation, very low quality of evidence)

Steroids

- *2016 Recommendations*
  - Suggest against using IV hydrocortisone to treat septic shock patients if adequate fluid resuscitation and vasopressor therapy are able to restore hemodynamic stability. If this is not achievable, we suggest IV hydrocortisone at a dose of 200 mg per day (weak recommendation, low quality of evidence)

Blood Products

- *2016 Recommendations*
  - Recommend that RBC transfusion occur only when hemoglobin concentration decreases to < 7.0 g/dL in adults in the absence of extenuating circumstances, such as MI, severe hypoxemia, or acute hemorrhage (strong recommendation, high quality of evidence)

- Suggest against use of FFP to correct clotting abnormalities in the absence of bleeding or planned invasive procedure (weak recommendation, very low quality of evidence)
- Suggest prophylactic platelet transfusion when counts are < 10,000 in the absence of apparent bleeding and when counts are < 20,000 if patient has a significant risk of bleeding. Higher platelet counts > 50,000 are advised for active bleeding, surgery, or invasive procedures (weak recommendation, very low quality of evidence)

Mechanical Ventilation

- *2016 Recommendations*
  - Recommend for sepsis-induced ARDS
    - Target tidal volume of 6 ml/kg PBW
    - Upper limit goal for plateau pressure
    - Higher PEEP over lower PEEP
    - Recruitment maneuvers
    - Prone over supine position in adults with P/F ratio < 150
  - Suggest using lower tidal volumes over higher tidal volumes in adult patients without ARDS (weak recommendation, low quality of evidence)
  - Recommend that mechanically vented patients be maintained with HOB elevated between 30 and 45 degrees (strong recommendation, low quality of evidence)

Glucose Control

- *2016 Recommendations*
  - Recommend a protocolized approach to blood glucose management in ICU patients with sepsis, commencing insulin dosing when 2 consecutive blood glucose levels are > 180 mg/dL. Target an upper limit blood glucose level <= 180 mg/dL (strong recommendation, high quality evidence)
  - Recommend that point-of-care testing of capillary blood be interpreted with caution because such measurements may not accurately estimate arterial blood or plasma glucose value (BPS)

Bicarbonate

- *2016 Recommendations*
  - Suggest against the use of sodium bicarbonate therapy to improve hemodynamics or to reduce vasopressor requirements in patients with hypoperfusion-induced lactic academia with pH >= 7.15 (weak recommendation, moderate quality of evidence)