**Sepsis Management - Adult**

**Patient exhibits at least two of the following modified SIRS criteria:**
- Temperature < 36 or ≥ 38.5°C
- Heart rate ≥ 110 bpm
- Respiratory rate > 24 bpm
- WBC count < 3 or ≥ 15 K/microliter

**Is patient unresponsive?**
- Yes: Call Code Blue Team
- No: Is the patient unstable?
  - Yes: See Page 2: Sepsis Management
  - No: Sepsis?
    - Yes: For further work up, initiate Early Sepsis Order Set
    - No: Follow up evaluation by Sepsis APP and/or MERIT team

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**SIRS =** systemic inflammatory response syndrome  
**APP =** advanced practice provider

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1 For patients in the EC, only those with an inpatient status will be evaluated by the Code Blue Team, MERIT team and/or Sepsis APP.

2 The patient is considered unstable if any of the following is present:
- Systolic blood pressure < 90 mmHg
- Heart rate > 150 bpm
- Need for vasopressor support
- Cardiac arrhythmia
- Decline in baseline mental status

3 Sepsis APP only available in pilot area of G20
Sepsis Management - Adult

**TREATMENT**

- Initiate sepsis orders
  - Blood cultures blood x2. *Do not delay antibiotic therapy if cultures cannot be obtained within 45 minutes.*
  - Give Broad spectrum antibiotics – first dose **STAT**.
  - Cultures from sputum, urine, and other sources as indicated
  - CBC with differential, lactate, point of care lactate acid, phosphorus, calcium, PT, PTT, D-dimer, fibrinogen, total bilirubin, direct bilirubin, AST, ALT, alkaline phosphatase, LDH, albumin, and lipase
  - Verify adequate IV access
  - Give fluid challenge of 30 mL/kg crystalloids [e.g., plasmalyte, Lactated Ringer’s, sodium chloride 0.9% (NS)]; each liter should be given over 30-60 minutes
    - Reduce volume of fluid challenge if patient has history of LVEF < 40%
    - Do not use hetastarch fluids
  - Monitor vital signs and neuro checks every 1 hour for 6 hours
  - Maintain SpO₂ > 93% during fluid challenge
- Obtain transthoracic echocardiogram

**Septic Shock**

- Transfer to ICU for further management
- If elevated, repeat lactate acid level within 6 hours
- Consider placement of arterial line and central venous access
- Monitor and maintain respiratory/hemodynamic status
- May repeat fluid bolus if indicated
- Consider norepinephrine for persistent hypotension
- Primary team to consider goals of care discussion if appropriate

**MAP < 65 mmHg despite fluid resuscitation?**

- Yes
  - See Page 3: EC/ICU Management
- No

**Sepsis**

- Reassess patient frequently
- Monitor and maintain respiratory/ hemodynamic status
- Request appropriate team consults
- Follow up evaluation by Sepsis APP¹ and/or MERIT team
- Continue broad spectrum antibiotics
- Assess IV fluid provision
- Review stat labs
- If elevated, repeat lactate acid level within 6 hours

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¹ Sepsis APP only available in pilot area of G20

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Sepsis Management - Adult

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Septic Shock in the EC/ICU (inpatient unit until ICU bed available)

- Consider further fluid challenge as needed based on hemodynamic monitoring variables
- Consider albumin 5% for patients who require substantial amounts of crystalloids

**Resuscitation Goals**
- MAP ≥ 65 mmHg
- Urine output ≥ 0.5 mL/kg/hour (consider higher target if oliguric)
- Normalization of lactic acid if elevated (decrease of 10% every 2 hours)

**Sepsis Management Goals**
- Tidal volume for mechanically ventilated patients with ARDS is 6 mL/kg, and the initial upper limit goal for plateau pressures is ≤ 30 cm H₂O
- Glucose after initial patient stabilization < 180 mg/dL (tight glucose control not recommended)
- Stress ulcer prophylaxis if risk factors present for GI bleed
- Deep vein thrombosis prophylaxis

**MAP < 65 mmHg?**

- Yes → Dobutamine continuous infusion to improve perfusion and decrease lactic acid
- No → Check cardiac index

**Low-output shock?**

- Yes → Check Hgb
- No → RBC transfusion to maintain Hgb ≥ 7 grams/dL

**Check MAP**

- Yes → MAP < 65 mmHg?
- No

**Check Hgb**

- Yes → Hgb < 7 grams/dL?
- No

**ARDs = acute respiratory distress syndrome**

1 Consider higher target if patient has history of hypertension, diabetes mellitus, vasculopathy, increased abdominal pressure, ensuing renal failure, or pulmonary hypertension

2 If inpatient, may start norepinephrine as listed above while awaiting transfer to ICU (notify MERIT and prepare for immediate transfer to ICU)

3 Refractory hypotension is defined as MAP < 65 mmHg despite adequate fluid resuscitation and vasopressors

4 Surviving Sepsis Guidelines recommend that RBC transfusions occur only when hemoglobin concentration decreases to < 7 grams/dL in adults in the absence of extenuating circumstances, such as myocardial ischemia, severe hypoxemia, or acute hemorrhage (strong recommendation, high quality of evidence). For the extenuating circumstances, the goal is ≥ 8 grams/dL.

5 Risk factors for GI bleed: mechanical ventilation > 48 hours, coagulopathy, preexisting liver disease, renal replacement therapy, higher organ failure scores

If refractory hypotension², add hydrocortisone 50 mg IV every 6 hours

Anticipated approval by the Executive Committee of the Medical Staff on 03/17/2020
APPELLIX A: Suspicion of Infection

- Fever or hypothermia
- Recent surgical procedure
- Immunocompromised
  - Chemotherapy
  - Steroids/immunosuppressed
  - Loss of skin integrity
  - HIV/suspected HIV
- Skin wound
- Invasive device
  - Central line
  - Foley catheter
- Infiltrate on chest x-ray
- Cough with sputum production
- Diarrhea with or without abdominal pain
- History of diabetes mellitus
- Cirrhosis
- Unilateral sinusitis (and/or facial swelling)

APPELLIX B: SOFA Score to Assess for Organ Dysfunction

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<tr>
<th>Variables</th>
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<th>2</th>
<th>3</th>
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<tr>
<td>Respiratory</td>
<td></td>
<td></td>
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<tr>
<td>PaO(_2)/FiO(_2) (mmHg)</td>
<td>≥ 400</td>
<td>300 - 399</td>
<td>200 - 299</td>
<td>100 - 199</td>
<td>&lt; 100</td>
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<tr>
<td>Coagulation</td>
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<tr>
<td>Platelets (K/microliter)</td>
<td>≥ 150</td>
<td>100 - 149</td>
<td>50 - 99</td>
<td>20 - 49</td>
<td>&lt; 20</td>
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<tr>
<td>Liver</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bilirubin (mg/dL)</td>
<td>&lt; 1.2</td>
<td>1.2 - 1.9</td>
<td>2 - 5.9</td>
<td>6 - 11.9</td>
<td>&gt; 12</td>
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<td>Cardiovascular</td>
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<td>Hypotension</td>
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<tr>
<td>MAP ≥ 70 mmHg</td>
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<tr>
<td>MAP &lt; 70 mmHg</td>
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<tr>
<td>Dopamine</td>
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<td></td>
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<tr>
<td>&lt; 5 mcg/kg/minute or dobutamine (any dose)</td>
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<tr>
<td>Dopamine</td>
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<td>5.1 - 15 mcg/kg/minute, or epinephrine ≤ 0.1 mcg/kg/minute, or norepinephrine ≤ 0.1 mcg/kg/minute</td>
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<tr>
<td>Dopamine</td>
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<tr>
<td>&gt; 15 mcg/kg/minute, or epinephrine &gt; 0.1 mcg/kg/minute, or norepinephrine &gt; 0.1 mcg/kg/minute</td>
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<td>Central nervous system</td>
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<tr>
<td>Glasgow Coma Scale</td>
<td>15</td>
<td>13 - 14</td>
<td>10 - 12</td>
<td>6 - 9</td>
<td>&lt; 6</td>
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<tr>
<td>Renal</td>
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<td></td>
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</tr>
<tr>
<td>Creatinine (mg/dL) or Urine Output (mL/day)</td>
<td>&lt; 1.2</td>
<td>1.2 - 1.9</td>
<td>2 - 3.4</td>
<td>3.5 - 4.9 or</td>
<td>≥ 5.0 or</td>
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<td></td>
<td>&lt; 500 mL/day</td>
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</table>

PaO\(_2\) = partial pressure of oxygen
FiO\(_2\) = fraction of inspired oxygen

1 Increase in SOFA score by 2 or more points from baseline is indicative of organ dysfunction

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Department of Clinical Effectiveness V9
Anticipated approval by the Executive Committee of the Medical Staff on 03/17/2020
Suggested Readings


DEVELOPMENT CREDITS

This practice consensus algorithm is based on majority expert opinion of the Sepsis work group at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

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