PRESENTATION

Patient exhibits at least two of the following modified SIRS criteria:
- Temperature < 36 or > 38.4°C
- Heart rate > 110 bpm
- Respiratory rate > 24 bpm
- WBC count < 3 or > 15 K/microliter

EVALUATION

Is patient unresponsive?
- Yes → Call Code Blue Team
- No → Is the patient unstable?
  - Yes → MERIT team to evaluate and notify Primary MD/APP STAT
  - No → See Page 2: Sepsis Management

TREATMENT

Sepsis?
- Yes → See Page 2: Sepsis Management
- No → Sepsis APP1,2 to notify Primary MD/APP

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SIRS = systemic inflammatory response syndrome
APP = advanced practice provider

1 For patients in the Acute Cancer Care Center, only those with an inpatient status will be evaluated by the Code Blue Team, MERIT team and/or Sepsis APP2
2 Sepsis APP only available in pilot area of G20

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Department of Clinical Effectiveness V10
Approved by the Executive Committee of the Medical Staff on 12/15/2020
Inpatient Sepsis Management - Adult

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### 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, lactic acid, point of care lactic acid (if available), ABG, basic metabolic panel, magnesium, 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
- Frequent vital signs and neuro checks as ordered
- Maintain SpO\textsubscript{2} > 93% during fluid challenge

**Obtain transthoracic echocardiogram**

**Septic Shock**
- Transfer to ICU for further management
- If elevated, repeat lactic 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

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

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

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

ACCC = Acute Cancer Care Center
LVEF = left ventricular ejection fraction
MAP = mean arterial pressure = 1/3 (SBP - DBP) + DBP

Approved by the Executive Committee of the Medical Staff on 12/15/2020

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

- Check MAP
  - MAP < 65 mmHg?
    - Yes: Consider further fluid challenge as needed based on hemodynamic monitoring variables
    - No: Consider albumin 5% for patients who require substantial amounts of crystalloids

- Check cardiac index
  - Low-output shock?
    - Yes: Dobutamine continuous infusion to improve perfusion and decrease lactic acid
    - No: RBC transfusion to maintain Hgb ≥ 7 grams/dL.

- Check Hgb
  - < 7 grams/dL?
    - Yes: Norepinephrine (1st line) IV infusion per Critical Care Adult Continuous Infusion Vasopressor Orders
    - No: Epinephrine (2nd line) IV infusion per Critical Care Adult Continuous Infusion Vasopressor Orders

- If refractory hypotension, add hydrocortisone 50 mg IV every 6 hours

Resuscitation Goals
- MAP ≥ 65 mmHg (DBP > 55 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

ACCC = Acute Cancer Care Center
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

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APPENDIX 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)

APPENDIX B: SOFA Score to Assess for Organ Dysfunction

<table>
<thead>
<tr>
<th>Variables</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<td>Respiratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PaO₂/FiO₂ (mmHg)</td>
<td>≥ 400</td>
<td>300 - 399</td>
<td>200 - 299</td>
<td>100 - 199</td>
<td>&lt; 100</td>
</tr>
<tr>
<td>Coagulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>Liver</td>
<td></td>
<td></td>
<td></td>
<td></td>
<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></td>
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</tr>
<tr>
<td>Hypotension</td>
<td>MAP ≥ 70 mmHg</td>
<td>MAP &lt; 70 mmHg</td>
<td>Dopamine &lt; 5 mcg/kg/minute or dobutamine (any dose)</td>
<td>Dopamine 5.1 - 15 mcg/kg/minute, or epinephrine ≤ 0.1 mcg/kg/minute, or norepinephrine ≤ 0.1 mcg/kg/minute</td>
<td>Dopamine &gt; 15 mcg/kg/minute, or epinephrine &gt; 0.1 mcg/kg/minute, or norepinephrine &gt; 0.1 mcg/kg/minute</td>
</tr>
<tr>
<td>Central nervous system</td>
<td></td>
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<td></td>
<td></td>
</tr>
<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>
</tr>
<tr>
<td>Renal</td>
<td></td>
<td></td>
<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>
</tr>
<tr>
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<td></td>
<td>-</td>
<td>-</td>
<td>&lt; 500 mL/day</td>
<td>≥ 200 mL/day</td>
</tr>
</tbody>
</table>

PaO₂ = partial pressure of oxygen
FiO₂ = fraction of inspired oxygen

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