ED Pediatric Sepsis Pathway

Triage: Assess whether FEVER at home or a High Risk patient. Document in ED Sepsis Screening section of the Triage Navigator. Record vital signs

Patient has 2 or more of the following
- Fever,
- High Risk,
- Abnormal HR or RR,
- Abnormal WBC

1. Fever
   - ED Temp <36 or >38 C, a home temp or parent report of tactile fever

2. High risk
   - Central Line/PICC/Port
   - Malignancy
   - Neonate 0-4 weeks of age
   - Chronic oral steroid dependence (asthma, autoimmune disease)
   - Asplenia including Sickle Cell Disease
   - Congenital heart disease
   - Bone Marrow or Solid Organ Transplant
   - Complex urogenital anatomy/repair
   - Severe neurologic impairment
   - Technology dependence

3. Abnormal Heart Rate (HR) or Respiratory Rate (RR)

<table>
<thead>
<tr>
<th>Age</th>
<th>Abnormal HR</th>
<th>Abnormal RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 month</td>
<td>&lt;100 or &gt;180</td>
<td>&gt;60</td>
</tr>
<tr>
<td>1 month - &lt; 1 year</td>
<td>&lt;90 or ≥160</td>
<td>&gt;60</td>
</tr>
<tr>
<td>1-&lt; 2 years</td>
<td>≥160</td>
<td>&gt;40</td>
</tr>
<tr>
<td>2-5 years</td>
<td>≥140</td>
<td>&gt;40</td>
</tr>
<tr>
<td>6-12 years</td>
<td>≥130</td>
<td>&gt;30</td>
</tr>
<tr>
<td>13-18 years</td>
<td>≥110</td>
<td>&gt;18</td>
</tr>
</tbody>
</table>

4. WBC count <5,000 or >12,000 if available when patient screened

SEPSIS SCREEN POSITIVE
1. Notify attending or resident in person for immediate assessment and document
2. Obtain BP, complete triage and assign ESI level (and room as appropriate)

Attending/Resident Assessment Confirms Sepsis

Initiate ED PEDIATRIC SEPSIS BUNDLE. Use PED SEPSIS Order Set
- Establish IV or IO
- Obtain CBC with diff, loaded blood gas and blood culture
- Push isotonic FLUIDS-20 ml/kg boluses (x3 if indicated) via pressure bag or syringe within 15”
- Administer ANTIBIOTICS after blood culture obtained; do not delay if culture cannot be drawn
- Implement SEPTIC SHOCK ALGORITHM if septic shock suspected
- Admit patient to PICU if ≥ 60ml/kg fluid given or physician concern.

CWK 6-6-16
ED Pediatric Sepsis Pathway

**Attending/Resident Assessment**

1. Confirm Sepsis Screen Vital Signs
2. Obtain Brief History
3. Assess for
   - Altered MENTAL STATUS
   - Mottled, cool SKIN
   - Weak, thready or Bounding PULSES
   - > 3 SEC Cap Refill
   - Hypotension *
   - Other physician concerns

**ANTIBIOTICS**

**PEDIATRIC ANTIBIOTICS**

*Hypotension

<table>
<thead>
<tr>
<th>Age</th>
<th>Systolic BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 month</td>
<td>&lt;60</td>
</tr>
<tr>
<td>1 mo-1 year</td>
<td>&lt;70</td>
</tr>
<tr>
<td>1-2 year</td>
<td>&lt;74</td>
</tr>
<tr>
<td>3-4 year</td>
<td>&lt;78</td>
</tr>
<tr>
<td>5-6 year</td>
<td>&lt;82</td>
</tr>
<tr>
<td>7-8 year</td>
<td>&lt;86</td>
</tr>
<tr>
<td>9 y and older</td>
<td>&lt;90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age &gt; 28 days – IMMUNOCOMPROMISED AND/OR SIGNIFICANT PRIOR ANTIBIOTIC USE WITHIN PREVIOUS 20 DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary therapy</td>
</tr>
<tr>
<td>Vancomycin</td>
</tr>
<tr>
<td>Beta lactam allergy</td>
</tr>
<tr>
<td>Vancomycin</td>
</tr>
<tr>
<td>Suspected source</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neonate &lt; or = 28 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary therapy</td>
</tr>
<tr>
<td>Gentamicin</td>
</tr>
<tr>
<td>HSV concern</td>
</tr>
<tr>
<td>Gentamicin AND</td>
</tr>
<tr>
<td>Acyclovir</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suspected source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrointestinal</td>
</tr>
<tr>
<td>Gentamicin AND</td>
</tr>
<tr>
<td>Metronidazole</td>
</tr>
</tbody>
</table>
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**SEPTIC SHOCK ALGORITHM**

Recognize decreased mental status and perfusion. Begin high flow O₂. Establish IV/IO access.

**Initial Resuscitation:** If not already done, push boluses of 20 cc/kg isotonic saline or colloid up to ≥ 60 cc/kg until perfusion improves or unless rales or hepatomegaly develop. Correct hypoglycemia and hypocalcemia. Begin antibiotics if not already.

Fluid Refractory Shock
Begin inotrope IV/IO.
Use atropine IV/IO and ketamine IV/IO/IM to obtain central access and airway if needed.
Reverse cold shock by titrating dopamine or, if resistant, epinephrine.
Reverse warm shock by titrating norepinephrine.
Use central line if available; otherwise give peripherally.

Catecholamine Resistant Shock
Begin hydrocortisone if at risk for absolute adrenal insufficiency.

Admit to PICU and monitor CVP. Attain normal MAP-CVP and ScvO₂> 70%

**Inotrope Doses**

- **Dopamine:** dose up to 10 mcg/kg/min
- **Epinephrine (EPI):** start at 0.03-0.05mcg/kg/min (max dose-0.3 micrograms/kg/min)
- **Norepinephrine (Norepi):** start at 0.1 mcg/kg/min (max dose 1 micrograms/kg/min)

**Cold Shock with normal BP**
1. Titrate fluid and EPI, ScvO₂>70%, Hgb > 10g/dL
2. If SvcO2 still <70% add vasodilator with volume loading (nitrosovasodilators, milrinone, imrinone and others). Consider levosimendan

**Cold Shock with low BP**
1. Titrate fluid and EPI, ScvO₂>70%, Hgb > 10g/dL
2. Consider Norepi if still hypotensive
3. If SvcO2 still <70% consider dobutamine, milrinone, enoximone or levosimendan

**Warm Shock with low BP**
1. Titrate fluid and EPI, ScvO₂>70%, Hgb > 10g/dL
2. Consider vasopressin, terlipressin or angiotensin if still hypotensive
3. If SvcO2 still <70% consider low dose EPI

**Persistent Catecholamine Resistant Shock**
Rule out and treat pericardial effusion, pneumothorax and intra-abdominal pressure > 12mm Hg
Consider pulmonary artery, PICCO or FATD catheter and/or Doppler ultrasound to guide fluid, inotrope, vasopressor, vasodilator and hormonal therapies
Goal C.I. > 3.3 and < 6.0 L/min/m²

0 min
5 min
15 min
60 min

Time Frame

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