**HemOnc Suspected Infection - fever in community ED v1.0**

**Summary of Version Changes**

- Start antibiotics within 1 hour of arrival

**Fevers Management**

- No rectal temperatures NSAIDs contraindicated

**Signs & Symptoms of Sepsis**
- Hypotension (MAP ≥ 5th percentile for age)
- Tachycardia
- Poor perfusion
- Reduced urine output
- Tachypnea/ new oxygen requirement
- Mental status changes

**SCH HemOnc Provider**

- Will reach out to external ED and should provide the following information:
  - **HemOnc:**
    - Patient is on pathway and will receive antibiotics
    - Which empiric antibiotics should be given (see below)?
    - Remind family to apply EMLA to port

**Are There Signs & Symptoms of Evolving Sepsis?**

- **AND** provider concern for sepsis / septic shock
- **OR** Any ill appearing HemOnc patient

**Labs (‘Do not delay blood cultures if family has not applied EMLA)***

- STAT CBC with differential
- Blood cultures: aerobic, anaerobic, fungal from all lumens of central venous catheter
- If unable to access central line, place PIV
- Other diagnostic tests as clinically indicated
- Rapid Respiratory Virus PCR
- Chest X-ray

**Administer Empiric Antimicrobials**

- **“Do not delay first dose for any diagnostic evaluations with the exception of blood cultures***
- HemOnc:
  - Start Ceftazidime: (or cefepime if ceftazidime is not immediately available)
  - **OR**, Cefepime for patients with AML, infant ALL, relapsed ALL, history of s viridans or ceftazidime allergy
  - **OR**, Meropenem for patients allergic to non-Ceftazidime 3rd generation cephalosporins
  - Discuss need for alternate antibiotics with SCH HemOnc Provider, including history of resistant organisms, and localizing symptoms of infections

**Are There Signs & Symptoms of Evolving Sepsis?**

- **Yes**: Discuss discharge from ED with HemOnc Provider
- **No**: Hemodynamically stable for 60 minutes after completion of initial empiric antibiotics.

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**Off Pathway**

- Call Hem/Onc Team
- 206-987-2000
- Communication Center
- 206-987-8899
• For patients with fever and neutropenia or ill appearance, the goal is to **administer** antibiotics *WITHIN ONE HOUR OF ED ADMISSION*.

• When family notices child is febrile, they will call the HemOnc fellow, BMT provider or clinical team.

• The HemOnc provider will direct whether or not patient should be put on pathway.

• If the family has not applied EMLA prior to arrival, **DO NOT** apply LMX before accessing line. Fever is an emergency in these patients. It is not safe to wait. Families will be counseled about this in clinic.

• If the patient is on pathway, they must get empiric antibiotics as soon as line is accessed and blood is drawn for culture. Order the first dose of empiric antibiotics (Ceftazidime, Cefepime or Meropenem) when the patient arrives

• **DO NOT WAIT** for ANC result or call the fellow again before giving the first dose of antibiotics.

• **STAT CBC with differential** should be ordered for these patients (as indicated in the orderset). Patients with presumed or evolving severe sepsis or refractory hypotension despite 40ml/kg NS require addition of gentamicin and vancomycin **AND consult with Hem/Onc Provider re: medical transport to SCH**

• Patients will stay in the ED for one hour after administration of empiric antibiotics and fluid boluses in order to allow time for assessment of possible clinical deterioration. Prior to admission / transfer to the HemOnc unit, a patient must demonstrate resolution of any hypotension as detailed in the hypotension/MAP slide attached.
## MAP: Definition of hypotension and resuscitation goals

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Critical Hypotension</th>
<th>Hypotension Threshold</th>
<th>Minimum Resuscitation Goal</th>
<th>Normotension for Age</th>
<th>Hypertension Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>37 weeks PMA-30 Days</td>
<td>≤ 1%</td>
<td>≤ 5%</td>
<td>≥10%</td>
<td>50%</td>
<td>≥95%</td>
</tr>
<tr>
<td>1-3 Months</td>
<td>32</td>
<td>39</td>
<td>42</td>
<td>56</td>
<td>79</td>
</tr>
<tr>
<td>3-6 Months</td>
<td>34</td>
<td>41</td>
<td>44</td>
<td>59</td>
<td>82</td>
</tr>
<tr>
<td>6-12 Months</td>
<td>37</td>
<td>44</td>
<td>47</td>
<td>62</td>
<td>86</td>
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<tr>
<td>1-2 Years</td>
<td>41</td>
<td>48</td>
<td>52</td>
<td>67</td>
<td>92</td>
</tr>
<tr>
<td>2-3 Years</td>
<td>45</td>
<td>52</td>
<td>56</td>
<td>72</td>
<td>96</td>
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<tr>
<td>3-4 Years</td>
<td>45</td>
<td>52</td>
<td>55</td>
<td>69</td>
<td>90</td>
</tr>
<tr>
<td>4-5 Years</td>
<td>45</td>
<td>52</td>
<td>55</td>
<td>69</td>
<td>88</td>
</tr>
<tr>
<td>5-6 Years</td>
<td>46</td>
<td>53</td>
<td>56</td>
<td>69</td>
<td>88</td>
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<tr>
<td>6-7 Years</td>
<td>47</td>
<td>54</td>
<td>58</td>
<td>71</td>
<td>89</td>
</tr>
<tr>
<td>7-8 Years</td>
<td>48</td>
<td>55</td>
<td>59</td>
<td>72</td>
<td>90</td>
</tr>
<tr>
<td>8-9 Years</td>
<td>49</td>
<td>55</td>
<td>59</td>
<td>72</td>
<td>91</td>
</tr>
<tr>
<td>9-10 Years</td>
<td>49</td>
<td>56</td>
<td>59</td>
<td>73</td>
<td>92</td>
</tr>
<tr>
<td>10-11 Years</td>
<td>49</td>
<td>56</td>
<td>59</td>
<td>73</td>
<td>92</td>
</tr>
<tr>
<td>11-12 Years</td>
<td>49</td>
<td>56</td>
<td>59</td>
<td>73</td>
<td>92</td>
</tr>
<tr>
<td>12-13 Years</td>
<td>49</td>
<td>56</td>
<td>59</td>
<td>73</td>
<td>92</td>
</tr>
<tr>
<td>13-14 Years</td>
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<td>56</td>
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<td>74</td>
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<td>14-15 Years</td>
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<td>56</td>
<td>59</td>
<td>74</td>
<td>94</td>
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<tr>
<td>15-16 Years</td>
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<td>56</td>
<td>59</td>
<td>75</td>
<td>94</td>
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<tr>
<td>16-17 Years</td>
<td>49</td>
<td>57</td>
<td>61</td>
<td>75</td>
<td>95</td>
</tr>
<tr>
<td>17-18 Years</td>
<td>49</td>
<td>57</td>
<td>62</td>
<td>76</td>
<td>96</td>
</tr>
</tbody>
</table>
# Suggested Severe Sepsis/Septic Shock Resuscitation Goals

## Clinical Goals for Initial Resuscitation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Arterial Pressure (MAP)</strong></td>
<td>Age-related (see table above)</td>
<td>Arterial Monitoring preferred</td>
</tr>
<tr>
<td><strong>Urine Output (UOP)</strong></td>
<td>&lt; 30 kg: &gt; 1 ml/kg/hr&lt;br&gt;≥ 30 kg: ≥ 30 ml/hr</td>
<td>Inadequate urine output is one sign of poor end-organ perfusion</td>
</tr>
<tr>
<td><strong>Central Venous Pressure (CVP)</strong></td>
<td>8-12 cm H2O (natural airway)&lt;br&gt;12-15 cm H2O (mechanical ventilation)</td>
<td>Most accurately measured from CVL with tip at the SVC-RA junction;&lt;br&gt;Femoral CVL, PICC and Broviac measurements less reliable, but trends may be useful</td>
</tr>
<tr>
<td><strong>Lactate</strong></td>
<td>&lt; 4 mmol/L or&lt;br&gt;≥ 10% decrease every 2 hours</td>
<td>Elevated lactate &gt; 4 mmol/L may be sign of shock with inadequate oxygen delivery (ref: Puskarich et al. Resuscitation, 2011)</td>
</tr>
<tr>
<td><strong>Central Venous Oxygen Saturation (ScvO2)</strong></td>
<td>≥ 70%&lt;br&gt;Note: Elevated ScvO2 (&gt; 80%) may occur in sepsis due to &quot;cytopathic hypoxia&quot; despite ongoing shock</td>
<td>Most accurately measured from CVL with tip at the SVC-RA junction or long femoral line with tip near RA</td>
</tr>
<tr>
<td><strong>Hemoglobin</strong></td>
<td>Hgb ≥ 10 g/dL (for patients in shock&lt;br&gt;- ScvO2 &lt; 70%, lactate &gt; 4 mmol/L)</td>
<td>Hemoglobin is a primary determinant of O2 delivery; thus, anemia should be treated in shock. Patients NOT in shock may tolerate a lower Hgb level of 7</td>
</tr>
<tr>
<td><strong>Mental Status</strong></td>
<td>Alert and appropriate for age</td>
<td>Lethargy, confusion, agitation is one sign of poor end-organ perfusion</td>
</tr>
<tr>
<td><strong>Capillary Refill</strong></td>
<td>&lt; 2 seconds</td>
<td>Flash capillary refill can be seen in warm shock, delayed capillary refill can be seen in cold shock</td>
</tr>
</tbody>
</table>

If receive NS bolus for hypotension:
- Stable BP: Two BP 10-15 minutes apart above the 10th percentile, 30 minutes after bolus is complete

[Return to ED Phase]
Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

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Summary of Version Changes

Bibliography