Septic Shock v9.0 Patient Flow Map

Approval & Citation
Summary of Version Changes
Explanation of Evidence Ratings

Patient presents to the ED with fever and/or concern for infection and ED sepsis score ≥ 6

BPA fires

RN and Provider Huddle: Is the patient ill appearing?

Yes

Well-appearing patients should be placed on the appropriate ED CSW pathway for their underlying condition (e.g. ED HemOnc BMT Suspected Infection, ED Suspected Central Line Infection, ED Neonatal Fever)

No

Use the ED Suspected Septic Shock pathway for all ill appearing patients including HemOnc/BMT, Central Line Infection and Neonates

ED Septic Shock Pathway

Inpatient Admit Criteria
- Resolution of hypotension and no ongoing signs of sepsis after ≤ 40 ml/kg NS bolus
- First dose antibiotics administered
- RISK to follow

Minute 60 Huddle: Does patient meet inpatient admit criteria?

YES

Does NOT meet Inpatient Admit criteria
- Admit to ICU
- Follow ICU Septic Shock Pathway
- Use PICU/CICU Septic Shock Admit Plan
- Antibiotics, blood cultures for specific populations included in sub plans

NO

RISK RN to follow all patients admitted with concern for sepsis

Concern for evolving sepsis
- Call RRT or Code Blue
- Follow Inpatient New Septic Shock Pathway
- Use Inpatient New Septic Shock Plan

Previously healthy > 30 days
- Admit to General Medicine
- Follow Admit from ED Septic Shock Pathway
- Use Inpatient Septic Shock Plan

Previously healthy < 30 days
- Admit to General Medicine
- Follow Neonatal Fever Pathway
- Use Inpatient Fever Neonatal 0-30 days Plan

HemOnc/ BMT Suspected Infection
- Admit to Cancer Care Unit
- Follow HemOnc/BMT Suspected Infection Pathway
- Use Hemonc Suspected Infection Admit Plan

Central Line Infection
- Admit to General Medicine/GI Transplant
- Follow Central Line Infection Pathway
- Use Admit orders + Central Line Infection Plan

Any admitted patient with concern for new or evolving septic shock

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

For questions concerning this pathway, contact SepticShock@seattlechildrens.org

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Last Updated: May 2021
Next Expected Revision: December 2021
**Sevent Shock v9.0**  
**Suspected Septic Shock (ED)**

### PHASE I

#### Inclusion Criteria
- Any patient with clinical concern for sepsis/septic shock OR ED Sepsis Score of 6 or greater AND ED attending/fellow assessment with concern for sepsis/septic shock.

#### Exclusion Criteria
- None

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

#### Urgent Care Transfer Recommendations
- Concern for septic shock
- Provider to Provider handoff
- Continue pathway while waiting for transfer

#### Summary of Version Changes
- Provider to Provider handoff
- Concern for septic shock

#### SHOCK TIME GOALS

**Time Zero = ED Septic Shock Pathway Activation**

- **15 min:**
  - Assess airway, breathing, circulation
  - Provide supplemental oxygen
  - Reassess vital signs every 5 minutes
  - Order appropriate antibiotics

- **30 min:**
  - Place 2 large bore PIVs if no central line
  - Consider PIV in patients with central line
  - If 2 unsuccessful IV attempts; consider IO
  - Access/Labs
    - EPOC: VBG, lactate, iCa
    - POCT glucose
    - Electrolytes, Magnesium, Phosphorus
    - BUN, Creatinine
    - Blood cultures
    - CBC + diff
    - CRP
    - Consider ABO/RhD and antibody

- **60 min:**
  - Previously healthy patients: ceftriaxone (+vancomycin if history of/concern for MRSA)
  - Appropriate antibiotics for specific populations:
    - HemOnco/BMT Suspected Infection (HOBSI)
    - Central Line Infection
    - Neonatal Fever (0-30 days)
    - Consider history of resistant organisms
  - Administer Antimicrobials
    - Consider ICU bed request
    - ! Notify ICU

#### Activate Septic Shock Pathway

- Place 2 large bore PIVs if no central line
- Consider PIV in patients with central line
- If 2 unsuccessful IV attempts: consider IO
- Access/Labs
  - EPOC: VBG, lactate, iCa
  - POCT glucose
  - Electrolytes, Magnesium, Phosphorus
  - BUN, Creatinine
  - Blood cultures
  - CBC + diff
  - CRP
  - Consider ABO/RhD and antibody

#### Inpatient Admit Criteria
- Resolution of hypotension AND no ongoing signs of sepsis after ≤ 40 mL/kg
- First dose antibiotics administered
- RISK to follow

#### ICU Transfer Criteria
- Recurrent hypotension despite >40mL/kg fluid resuscitation in the last 12 hours
- Fluid resuscitation includes either crystalloid or colloid
- Hypotension (MAP ≤ 5th percentile for age)
- Clinical situation not appropriate for ongoing fluid resuscitation
- Defined as underlying cardiac disease, lung disease, existing fluid overload, impaired renal function
- Lactate ≥ 4 or base excess < - 4 mmol
- Sustained change in mentation or perfusion (>15 minutes)
- Patient requires continuous ICU monitoring or ICU level respiratory support

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Last Updated: May 2021  
Next Expected Revision: December 2021
Inclusion Criteria:
- Any patient admitted to the ICU with concern for septic shock

Exclusion Criteria:
- None

ICU Admission
If the following have not already occurred:
- Oxygen by face mask
- Obtain 2 points of IV access
- Obtain laboratory studies per pathway
- Assure 1st antibiotic infused within 1 hour of shock identification
- IV fluid resuscitation: 40mL/kg or 2L in the first hour
- Order appropriate antibiotics for specific populations
- Correct hypoglycemia, hypocalcemia

Monitor response vital sign targets & clinical goals

Infection source control

Repeat fluid boluses

Fluid Refractory Shock
Consider central line, arterial line, Foley

Warm Shock
- Titrate norepinephrine
- Consider epinephrine, vasopressin
- PRBC if Hgb <10g/dL
- Consider intubation

Cold Shock; Low BP
- Titrate epinephrine
- Consider norepinephrine, dobutamine
- PRBC if Hgb <10g/dL
- Consider intubation, BNP, ECHO

Cold Shock; Normal BP
- Titrate epinephrine
- Consider milrinone, dobutamine if SCVO2 <70% or lactate elevated
- PRBC if Hgb <10g/dL
- Consider intubation, BNP, ECHO

Catecholamine Resistant Shock
- Consider stress-dose hydrocortisone
- Evaluate for:
  - Pericardial effusion
  - Pneumothorax
  - Intra-abdominal hypertension
  - Primary cardiac dysfunction

Consider ECLS

ICU to Inpatient Transfer Criteria
- Weaned off of inotropic support
- Not requiring ICU level of respiratory support
- Hemodynamically stable

Return to Flow
**Inclusion Criteria**
- Any patient who is admitted to a service other than the ICU on Septic Shock Pathway

**Exclusion Criteria**
- None

**PHASE IIB**

**Inclusion Criteria,**
- Any patient who is admitted to a service other than the ICU on Septic Shock Pathway

**Exclusion Criteria**
- None

**Patient placed on RISK dashboard**
- Vital signs Q 2 hours x 8 hours

**RISK Nurse Monitoring**
- RISK dashboard monitoring
- RISK nurse Inpatient evaluation
- RISK nurse determines time on dashboard
- RRT activation for signs of clinical deterioration

**Continued Sepsis Care**
- Continue appropriate antibiotics for specific populations x 48 hours
- Follow cultures daily, switch to narrow-spectrum antibiotics as indicated
- Discontinue antibiotics after 48 hours if cultures negative and clinically improving
- Advance diet as tolerated
- Continue maintenance IV fluids if indicated

**ICU Transfer Criteria**
- Recurrent hypotension, despite > 40mL/kg fluid resuscitation in the last 12 hours
- Fluid resuscitation includes either crystalloid or colloid
- Hypotension (MAP ≤ 5th percentile for age)
- Clinical situation not appropriate for ongoing fluid resuscitation
- Defined as underlying cardiac disease, lung disease, existing fluid overload, impaired renal function
- Lactate ≥ 4 or base excess < - 4 mmol
- Sustained change in mentation or perfusion (>15 minutes)
- Patient requires continuous ICU monitoring or ICU level respiratory support

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

Call RRT for signs of sepsis that require ICU presence within 30 minutes

Call code blue for imminent cardiac or pulmonary failure or neurologic emergency

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Septic Shock v9.0
Inpatient New Septic Shock

Approval & Citation

Phases of Septic Shock

- Pathway Activation
- New Septic Shock

Inclusion Criteria:
- Any patient who is admitted to a service other than the ICU on Septic Shock Pathway

Exclusion Criteria:
- None

Rapid Bedside Assessment

- Primary team huddle to activate Septic Shock pathway
- Call RRT
- Appropriate antibiotics for specific population
- Does patient meet RRT criteria?

Access/Initial Fluid Resuscitation

- Consider PIV in patients with central line if additional access is needed
- Administer 1st bolus of 20 mL/kg normal saline rapidly over 20 minutes or less
- Consider 5-10 mL/kg boluses if concern for fluid intolerance (cardiac/renal dysfunction)

Ongoing Resuscitation

- Administer 2nd bolus of 20 mL/kg normal saline rapidly over 20 minutes or less
- Order vasoactive/inotropic drips as indicated
- Consider blood products as indicated
- BMT patients: consider vasoactive/inotropic drips after 2nd NS bolus

Transfer to ICU

- Initiate vasoactive/inotropic drips for Fluid Refractory Shock
- Epinephrine for cold shock
- Norepinephrine for warm shock
- Titrate drips to resuscitation goals
- Consider broadening antibiotic coverage as indicated

ICU Transfer Criteria

- Recurrent hypotension despite > 40mL/kg fluid resuscitation in the last 12 hours
- Fluid resuscitation includes either crystalloid or colloid
- Hypotension (MAP ≤ 5th percentile for age)
- Clinical situation not appropriate for ongoing fluid resuscitation
- Defined as underlying cardiac disease, lung disease, existing fluid overload, impaired renal function
- Lactate ≥ 4 or base excess < - 4 mmol
- Sustained change in mentation or perfusion (>15 minutes)
- Patient requires continuous ICU monitoring or ICU level respiratory support

Exclusion Criteria:
- Patient requires continuous ICU monitoring or ICU level respiratory support

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Bedside Huddle

- ED Providers, PICU +/- hospitalist or relevant subspecialty team should attend the huddle
- Assess patient, review response to first 60 minutes of ED care
- Determine disposition: Does patient meet inpatient criteria (Normotensive after ≤ 40mL/kg NS boluses, well appearing with reassuring labs, first dose antibiotics administered)
  - IF no ► admit to PICU and use PICU septic shock order set
  - IF yes ► admit to appropriate inpatient team (general medicine, hemonc, GI)
    - Patients admitted to inpatient teams will be placed on the RISK dashboard
# Antibiotic Selection by Patient Population

<table>
<thead>
<tr>
<th>Patient Population</th>
<th>Antibiotic selection</th>
<th>Alternatives</th>
</tr>
</thead>
</table>
| Previously healthy < 28 days | Ampicillin and cefotaxime (or ceftazidime if cefotaxime unavailable)  
Consider ampicillin and gentamicin if CSF pleocytosis not > 20 WBC/mm per pathway recommendations | Acyclovir if HSV work up performed                                   |
| Previously healthy > 28 days | Ceftriaxone                                                | Consider vancomycin for patients with known history of MRSA          |
| Hematopoietic Cell Transplant (HCT/BMT) and HemOnc Suspected Infection patients. Pre-transplant patient-specific ID antibiotic plan may override these standard recommendations | Ceftazidime (or meropenem if already on ceftazidime) **PLUS  
Consider adding gentamicin and vancomycin if hypotension despite 40 cc/kg NS or sooner if ill appearing and/or signs of severe sepsis. **PLUS  
Consider adding clindamycin or metronidazole if suspected perineal or intra-abdominal infection, respectively (unless receiving meropenem) | Cefepime OR meropenem per pathway recommendations  
If concern for severe skin or perineal infection, consider use of “ED Necrotizing Soft Tissue Infection Plan” |
| Central Line Infection (not for HOSI/BMT) | • Immunocompetent – cefepime  **PLUS  
vancymycin and gentamicin  
• Immunocompromised – meropenem  **PLUS  
vancymycin plus gentamicin if ill appearing  **PLUS  
Consider adding fluconazole per pathway recommendations | Ciprofloxacin AND linezolid per pathway recommendations |
## 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>
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<tr>
<td>3-6 Months</td>
<td>37</td>
<td>44</td>
<td>47</td>
<td>59</td>
<td>82</td>
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<tr>
<td>6-12 Months</td>
<td>41</td>
<td>48</td>
<td>52</td>
<td>62</td>
<td>86</td>
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<tr>
<td>1-2 Years</td>
<td>45</td>
<td>52</td>
<td>56</td>
<td>67</td>
<td>92</td>
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<tr>
<td>2-3 Years</td>
<td>45</td>
<td>53</td>
<td>56</td>
<td>71</td>
<td>96</td>
</tr>
<tr>
<td>3-4 Years</td>
<td>45</td>
<td>52</td>
<td>55</td>
<td>69</td>
<td>90</td>
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<td>4-5 Years</td>
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<td>52</td>
<td>55</td>
<td>69</td>
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<tr>
<td>5-6 Years</td>
<td>46</td>
<td>53</td>
<td>56</td>
<td>69</td>
<td>88</td>
</tr>
<tr>
<td>6-7 Years</td>
<td>47</td>
<td>54</td>
<td>58</td>
<td>71</td>
<td>89</td>
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<tr>
<td>7-8 Years</td>
<td>48</td>
<td>55</td>
<td>59</td>
<td>72</td>
<td>90</td>
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<tr>
<td>8-9 Years</td>
<td>49</td>
<td>55</td>
<td>59</td>
<td>72</td>
<td>91</td>
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<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>
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<tr>
<td>13-14 Years</td>
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<td>93</td>
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<td>14-15 Years</td>
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<td>15-16 Years</td>
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<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

<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</td>
<td>Inadequate urine output is one sign of poor end-organ perfusion</td>
</tr>
<tr>
<td></td>
<td>≥ 30 kg: ≥ 30 ml/hr</td>
<td></td>
</tr>
<tr>
<td><strong>Central Venous Pressure (CVP)</strong></td>
<td>8-12 cm H2O (natural airway)</td>
<td>Most accurately measured from CVL with tip at the SVC-RA junction; Femoral CVL, PICC and Broviac measurements less reliable, but trends may be useful</td>
</tr>
<tr>
<td></td>
<td>12-15 cm H2O (mechanical ventilation)</td>
<td></td>
</tr>
<tr>
<td><strong>Lactate</strong></td>
<td>&lt; 4 mmol/L or ≥ 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</strong></td>
<td>≥ 70%</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 - 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>
SUMMARY OF 2020 Sepsis Guidelines
(resuscitation focused)

Source control recommendations:
- Emergent source control intervention be implemented as soon as possible.
- Appropriate diagnostic testing to identify the site of infection and microbial etiology should be performed.
- Removal of intravascular access devices that are confirmed to the source after other access established.

Fluid therapy:
- Initial resuscitation 40-60cc/kg in bolus fluid (10-20cc/kg/bolus) over the first hour, titrated to clinical marker of cardiac output and discontinued if signs of fluid overload develop (new or worsening pulmonary edema and/or hepatomegaly).
- Consensus is to avoid albumin, starch or gelatin and suggest balanced crystalloids.

Hemodynamic assessment:
- Clinical markers of cardiac output may include heart rate, blood pressure, capillary refill time, level of consciousness, and urine output.
- Recommend serial central venous oxygen saturation and blood lactate, until normalized.
- Avoid categorization of warm or cold shock.

Vasoactive therapy:
- Begin vasoactive infusions after 40-60cc/kg of fluid resuscitation if patient continues to have abnormal perfusion, with either epinephrine or norepinephrine through peripheral vein (or IO) if central access is not readily accessible.
- Consider vasopressin infusion for septic shock with high-dose catecholamines.
- While no recommendation for MAP goal are established, would recommend normotension for age when vasoactive agents are implemented.
- Do not withhold enteral nutrition based solely on use of vasoactive medications, begin once vasoactive medications have stabilized.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine output</td>
<td>&lt;30kg &lt;1.0cc/kg/hr, &gt;30kg &gt;30 cc/hr</td>
</tr>
<tr>
<td>Central venous oxygen, SvO2</td>
<td>&gt; 70%</td>
</tr>
<tr>
<td>Lactate</td>
<td>&lt;4 mmol/L</td>
</tr>
<tr>
<td>Hb</td>
<td>&gt; 7 g/dL</td>
</tr>
</tbody>
</table>

Consensus guidelines suggest against:
- Lipid emulsion, prokinetic agents, glutamine, arginine, zinc, selenium, thiamine, vitamin C or D.
- Prophylactic plasma or platelets without active bleeding.
- Plasma exchange without TAMOF, high volume ultrafiltration.
- Routine IVIG or hydrocortisone.
- Stress ulcer or DVT prophylaxis except for high risk patients.

Return to Flow
## Warm Shock & Cold Shock

<table>
<thead>
<tr>
<th></th>
<th>WARM shock</th>
<th>COLD shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral perfusion</td>
<td>Warm/flushed</td>
<td>Cold/clammy/cyanotic/mottled</td>
</tr>
<tr>
<td>Capillary refill</td>
<td>Brisk/flash; &lt;2 sec</td>
<td>Delayed; &gt;2 sec</td>
</tr>
<tr>
<td>Pulse</td>
<td>Bounding</td>
<td>Weak/thready</td>
</tr>
<tr>
<td>Heart rate</td>
<td>↑</td>
<td>↑ or ↓</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>May be normotensive</td>
<td>Usually hypotensive</td>
</tr>
<tr>
<td>Pulse pressure</td>
<td>Widened</td>
<td>Narrow</td>
</tr>
</tbody>
</table>
Instructions for finding the “Individualized Antibiotic Plan”
BMT Patients

- Begin fluid resuscitation with 20 ml/kg crystalloid or colloid
  - Consider smaller bolus volume (5-10ml/kg) in patients with known or suspected cardiac dysfunction
- Order vasoactive medications early
- If not clinically improving after 40 ml/kg start vasoactive medications
Approved by the CSW Septic Shock Team for 12/14/16 go-live date

CSW Sepsis/Septic Shock Team:

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ICU, Stakeholder
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HemOnc, Stakeholder
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Darren Migita, MD
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This pathway was developed through local consensus based on published evidence and expert opinion as part of Clinical Standard Work at Seattle Children’s. Pathway teams include representatives from Medical, Subspecialty, and/or Surgical Services, Nursing, Pharmacy, Clinical Effectiveness, and other services as appropriate.

When possible, we used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial or cohort studies. The rating is then adjusted in the following manner (from: Guyatt G et al. J Clin Epidemiol. 2011;4:383-94.):

Quality ratings are **downgraded** if studies:
- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings are **upgraded** if it is felt that:
- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

Guideline – Recommendation is from a published guideline that used methodology deemed acceptable by the team.

Expert Opinion – Our expert opinion is based on available evidence that does not meet GRADE criteria (for example, case-control studies).

**Quality of Evidence:**
- ⭐⭐⭐⭐ High quality
- ⭐⭐⭐⭐ Moderate quality
- ⭐⭐⭐ Low quality
- ⭐⭐⭐⭐⭐ Very low quality

Guideline
Expert Opinion
Summary of Version Changes

Version 1.0 (10/7/2015): Go live

Version 2.0 (2/12/2016): Clarification of clinical findings indicative of warm vs. cold shock added; updates to hypotension and resuscitation goals to reflect hospital standards; clarification of indication for RRT vs. code blue

Version 3.0 (12/14/2016): New Septic Shock Inpatient Plan update; Revision of Septic Shock Score Trigger; Inclusion of BMT in Hem/Onc Suspected Infection pathway (renamed Hem/Onc/BMT Suspected Infection - HOBSI)

Version 4.0 (5/22/2017): Updated MAP to include Normotension Median for Age (50 % ile). Added verbiage “Resolution of hypotension = Two blood pressure measurements obtained 15 minutes apart with MAP ≥10 %ile”


Version 5.0 (5/18/2018): Updated the recommendations for empiric therapy from pip/tazo to cefepime.

Version 6.0 (9/5/2018): Updated PHASE IIA to separate PICU/CICU Sepsis/Septic Shock Plan, including peripheral pressors.

Version 7.0 (10/16/2019): Cefotaxime is no longer available and has been replaced with ceftazidime. Sepsis Antibiotic Chart updated.

Version 8.0 (7/14/2020): Age range updated from <>30 days to <> 28 days on Sepsis Antibiotic Chart.

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.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children’s Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.
Search Methods, *Sepsis*, Clinical Standard Work

Studies were identified by searching electronic databases using search strategies developed and executed by a medical librarian, Jackie Morton. Searches were performed in April, 2015. The following databases were searched – on the Ovid platform: Medline (2012 to date), Cochrane Database of Systematic Reviews (2012 to date); elsewhere – Embase (2012 to date), Clinical Evidence, National Guideline Clearinghouse, TRIP (2012 to date) and Cincinnati Children’s Evidence-Based Care Guidelines.

Retrieval was limited to humans (any age) and English language. In Medline and Embase, appropriate Medical Subject Headings (MeSH) and Emtree headings were used respectively, along with text words, and the search strategy was adapted for other databases using their controlled vocabularies, where available, along with text words. Concepts searched were sepsis and specific laboratory diagnostic procedures or antibiotic therapeutics. Additional searches for concepts not specific to sepsis were Rapid Sequence Intubation (RSI) and sedation, anesthetic, paralytic or pain agents and lastly the use and number of peripheral intravenous lines. All retrieval was further limited to certain evidence categories, such as relevant publication types, Clinical Queries filters for diagnosis and therapy, index terms for study types and other similar limits.

An additional consensus document was identified by team members and added to results.

**Identification**

- 233 records identified through database searching
- 1 additional record identified through other sources

**Screening**

- 234 records after duplicates removed

- 234 records screened
- 167 records excluded

**Eligibility**

- 67 records assessed for eligibility

- 56 full-text articles excluded,
  - 5 did not answer clinical question
  - 46 did not meet quality threshold
  - 4 removed for other reasons
  - 1 was a duplicate

**Included**

- 11 studies included in pathway

Flow diagram adapted from Moher D et al.  BMJ 2009;339:bmj.b2535


Texas Children's Hospital Evidence-Based Outcomes Center. Recognition and Initial Management Septic Shock Review Summary. Updated 2015 January PDF.