

## Severe Sepsis Resuscitation Protocol: Invasive

<b>WHO</b>	<p>Septic Patient with Lactate <math>\geq 4</math> mmol/L or MAP <math>&lt; 65</math> after 2 liters crystalloid</p> <p style="text-align: center;"><b><u>AND</u></b></p> <p>Goals of care are curative</p>
<b>INITIAL RESUSCITATION</b>	<ul style="list-style-type: none"> <li>Administer 20-30 ml/kg isotonic <b>crystalloid bolus</b> over 20 minutes</li> <li>Send <b>cultures</b> of all likely sources of infection</li> <li>Think of <b>source control</b> (Infected catheter? Operative intervention for infection? Drainable pus?)</li> <li><b>Administer antibiotics</b> to cover all likely sources of infection</li> <li>Place <b>full-sterile central line</b> in the IJ (preferably with ultrasound) or subclavian vein</li> </ul>
<b>SpO2</b>	<p>If patient's O<sub>2</sub> saturation is <math>&lt; 90\%</math> on high fiO<sub>2</sub> supplemental oxygen (non-rebreather mask), consider:</p> <ul style="list-style-type: none"> <li><b>Intubation</b> (Beware, the patient may drop their blood pressure precipitously) <ul style="list-style-type: none"> <li>Place on lung protective ventilation</li> <li>Place on pain control regimen, administer sedation after pain controlled</li> </ul> </li> </ul>
<b>FLUIDS</b>	<p style="text-align: center;"><b><u>Choose 1 Strategy</u></b></p> <ul style="list-style-type: none"> <li><b>Dynamic IVC Ultrasound</b>-Keep giving 500-1000 ml boluses of isotonic crystalloid until there is <math>&lt; 30\%</math> change in IVC size if not intubated or <math>&gt; 12\%</math> if intubated.</li> <li><b>CVP</b>-Administer fluids until CVP <math>&gt; 10</math> mm Hg in non-intubated patients and <math>&gt; 14</math> mm Hg in intubated patients.</li> <li><b>Empiric Fluid Loading</b>-Patients with severe sepsis/septic shock may require at least 6 liters of fluid during their acute resuscitation (first 6 hours of care).</li> </ul>
<b>RE-CHECKING MAP</b>	<ul style="list-style-type: none"> <li>If MAP is <math>&lt; 65</math> after adequate fluid loading, <b>start vasopressors</b>.</li> <li>Titrate vasopressors to achieve a MAP <math>\geq 65</math>.</li> </ul>
<b>TISSUE OXYGENATION</b>	<ul style="list-style-type: none"> <li>Send repeat lactate <b><u>AND</u></b> ScvO<sub>2</sub></li> <li>If lactate has cleared by <math>\geq 10\%</math> <b><u>AND</u></b> ScvO<sub>2</sub> <math>\geq 70\%</math>, go to disposition</li> <li>If ScvO<sub>2</sub> <math>&lt; 70</math> <b>OR</b> lactate hasn't cleared by <math>\geq 10\%</math>, <b><u>choose 1 Option:</u></b> <ul style="list-style-type: none"> <li><b>If Hb <math>&lt; 7</math>:</b> transfuse 1 unit of PRBC</li> <li style="text-align: center;"><b><u>or</u></b></li> <li><b>Additional Fluids:</b> if using CVP to determine fluid status, administer an additional liter of isotonic crystalloid</li> <li style="text-align: center;"><b><u>or</u></b></li> <li><b>Inotropes:</b> especially if heart appears hypodynamic on echo. If calcium is low, replete that first. If not, administer dobutamine 5-20 mcg/kg/min.</li> <li style="text-align: center;"><b><u>or</u></b></li> <li><b>Intubate:</b> to decrease pulmonary metabolic load</li> <li style="text-align: center;"><b><u>or</u></b></li> <li><b>If Hb 7-10:</b> consider transfusion. Especially in elderly patients or patients with coronary artery disease</li> </ul> </li> <li>Send repeat lactate and ScvO<sub>2</sub>. If ScvO<sub>2</sub> <math>&lt; 70</math> or if lactate still has not cleared by <math>\geq 10\%</math>, continue with the above, trending lactates and ScvO<sub>2</sub> every 1 hour until these two goals are met.</li> </ul>
<b>DISPOSITION</b>	<ul style="list-style-type: none"> <li>Patients should get ICU consultation. If not an ICU candidate, should go to appropriately monitored bed.</li> <li>Periodically recheck patient for MAP <math>\geq 65</math>, good mental status, and good urine output.</li> <li>Consider trending lactate every Q 2-4 hours. If it starts rising again, restart protocol.</li> </ul>