**DETERMINE FLUID RESPONSIVENESS**

**PASSIVE LEG RAISE (PLR)**

- **Baseline: Semi-Recumbent position**
  Collect 3 minutes of stable data for average baseline Stroke Volume Index (SVI).
  When stable baseline is achieved, the PLR Challenge can be initiated.

- **Challenge: Leg Raise**
  Collect 3 minutes of data. Note the maximum % change in SVI ($\Delta$SVI) from baseline.
  Follow recommended methods and guidelines for leg raise (e.g., auto-pivot bed motion, wedge cushion/pillow).

- **Interpretation:** $\Delta$SVI $\geq$10%
  Patient likely to be Fluid Responsive
  SVI is likely to increase in response to IV fluids.
  Patient on the ascending portion of the Frank-Starling Curve.

- **Interpretation:** $\Delta$SVI <10%
  Patient Not Likely to be Fluid Responsive
  SVI is not likely to increase in response to IV fluids.
  Patient on the flat portion of the Frank-Starling Curve.

**Fluid Bolus (FB) Dynamic Assessment**

- **Baseline: Prepare for Bolus**
  For optimal results insure stable hemodynamics for 3 minutes prior to the bolus.
  When a stable baseline is achieved, the Bolus Challenge can be initiated.

- **Challenge: Bolus**
  Administer Bolus according to your clinical standards/protocols.
  250cc (3-5cc/kg) over 3-5 minutes.
  Note maximum % change of SVI ($\Delta$SVI) from baseline.
  2 minutes of challenge data required for results.

- **Interpretation:** $\Delta$SVI $\geq$10%
  Patient likely to be Fluid Responsive
  SVI is likely to increase in response to IV fluids.
  Patient on the ascending portion of the Frank-Starling Curve.

- **Interpretation:** $\Delta$SVI <10%
  Patient Not Likely to be Fluid Responsive
  SVI is not likely to increase in response to IV fluids.
  Patient on the flat portion of the Frank-Starling Curve.

**QUICK SETUP OF THE CHEETAH STARLING SV**

1. **Turn On The Cheetah Medical Monitor**
   Press the power button until the system turns on.

2. **Place & Connect Sensors**
   Place sensors on patient’s body and attach to patient cable according to their color. The CHEETAH Sensors should be positioned around the heart. The exact location is flexible. See sensor package for more information. The Starling SV is 100% non-invasive.

3. **Main Menu Screen**
   Select New Patient.

4. **Enter Patient Details**
   Input: ID, Age, Height, Weight and Gender. Select Finish.

5. **Review Data & Start Test**
   Confirm data accuracy, Select Update to correct data. Select Start Session then Confirm Sensor Placement.

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### Normal Hemodynamic Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Equation</th>
<th>Normal Adult Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Arterial Pressure (MAP)</td>
<td>80 x (MAP/CI)</td>
<td>70 – 105 mmHg</td>
</tr>
<tr>
<td>Cardiac Index (CI)</td>
<td>80 x (MAP/CI)</td>
<td>2.5 – 4.0 l/min</td>
</tr>
<tr>
<td>Cardiac Output (CO)</td>
<td>HR x CI/100</td>
<td>60 – 100 l/min/m²</td>
</tr>
<tr>
<td>Stroke Volume Index (SVI)</td>
<td>33 – 47 ml/m²/beat</td>
<td></td>
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<tr>
<td>Total Peripheral Resistance (TPR)</td>
<td>(SBP + (2 x DBP))/3</td>
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### Clinical Shock States

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<tr>
<th>Shock State</th>
<th>Cardiac Output</th>
<th>Hypovolemic Shock</th>
<th>Septic Shock</th>
<th>Sepsis</th>
<th>Sepsis-Related</th>
<th>Shock States/Low Blood Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Adult Range</td>
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</tbody>
</table>

### Patient Selection Tool

- **Shock States/Low Blood Pressure**: Septic, Sepsis, Cardiogenic, Neurogenic, Anaphylactic, Hypovolemic, Hypertensive, Neurogenic, Low Cardiac Output
- **Hypovolemic Shock**: Patients undergoing Continuous Renal Replacement Therapy (CRRT), or undergoing hemodialysis.
- **Septic Shock**: Patients with septic shock or sepsis.
- **Sepsis-Related**: Patients with septic shock or sepsis.
- **Cardiogenic Shock**: Patients with cardiogenic shock.
- **Neurogenic Shock**: Patients with neurogenic shock.
- **Sepsis**: Patients with sepsis.
- **Sepsis-Related**: Patients with sepsis-related conditions.
- **Hypovolemic**: Patients with hypovolemic shock.
- **Hypertensive**: Patients with hypertensive shock.
- **Anaphylactic**: Patients with anaphylactic shock.
- **Low Cardiac Output**: Patients with low cardiac output.
- **Neurogenic**: Patients with neurogenic shock.

### References

### Disclaimer
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