

# Pulsatility Index Pearls *(Should Involve Multidisciplinary Discussion)*

	High PI <i>from baseline</i>	Low PI <i>from baseline</i>
<b>Hypovolemia</b> CVP ↓ PAP ↓ PCWP ↓ MAP ↓ SV02 ↓	<ul style="list-style-type: none"> <li>• More common to result in high PI</li> <li>• Assess CVP, volume status</li> <li>• Consider small volume bolus</li> <li>• Consider hold diuretics</li> <li>• Evaluate for blood loss or other volume loss</li> </ul>	<ul style="list-style-type: none"> <li>• Rare unless almost no preload, resulting in no flow into LVAD with minimal to no native contractility</li> </ul>
<b>Tamponade</b> EARLY LATE CVP ↑ PAP ↓ or no change PCWP ↓ MAP ↓ SV02 ↓	<b>EARLY</b> <ul style="list-style-type: none"> <li>• Ensure adequate preload/BP</li> <li>• Echo to assess volume and location</li> <li>• Notify cardiovascular surgery</li> <li>• Assess anticoagulation labs/discuss temporary hold</li> </ul>	<b>LATE</b> <ul style="list-style-type: none"> <li>• Associated with low flow</li> <li>• Ensure adequate preload/BP</li> <li>• Echo to assess volume and location</li> <li>• Notify cardiovascular surgery</li> <li>• Assess anticoagulation labs/discuss temporary hold</li> </ul>
<b>Hypertension</b> CVP ↔ PAP ↑ or no change PCWP ↑ MAP ↑ SV02 ↔	<b>LESS SEVERE HYPERTENSION—more common</b> <ul style="list-style-type: none"> <li>• Assess BP goals for age</li> <li>• Consider IV continuous, IV intermittent or enteral anti-HTN medications, depending on severity</li> <li>• Assess for pain, anxiety, neuro exam</li> </ul>	<b>SEVERE HYPERTENSION</b> <ul style="list-style-type: none"> <li>• Significant afterload may limit forward flow in pump leading to transition to low PI</li> </ul>
<b>Pneumothorax</b> CVP ↑ PAP ↓ or no change PCWP ↓ MAP ↓ SV02 ↓	<ul style="list-style-type: none"> <li>• Assess respiratory symptoms</li> <li>• Consider chest x-ray</li> </ul>	<ul style="list-style-type: none"> <li>• Less common unless severe decrease in preload to pump</li> </ul>
<b>Arrhythmias</b> CVP ↑ PAP ↓ or no change PCWP ↓ MAP ↓ SV02 ↓	<ul style="list-style-type: none"> <li>• Depends on rhythm disturbance-if VT, may resemble RV failure</li> <li>• Assess EKG, echo; consider assess electrolytes</li> </ul>	<ul style="list-style-type: none"> <li>• Less common unless severe decrease in preload to pump</li> </ul>
<b>Right Heart Failure</b> CVP ↑ PAP ↓ PCWP ↓ MAP ↓ SV02 ↓	<b>LESS SEVERE RV FAILURE</b> <ul style="list-style-type: none"> <li>• RV failure tends to result in high PI</li> <li>• Assess CVP, oxygenation/ventilation</li> <li>• Consider echo</li> </ul>	<b>SEVERE RV FAILURE</b> <ul style="list-style-type: none"> <li>• RV failure can look like complete occlusion due to limited preload to left heart and the pump</li> </ul>
<b>Inflow Obstruction or Outflow Obstruction <i>(including EOGO*)</i></b> CVP ↑ PAP ↑ PCWP ↑ MAP ↓ SV02 ↓ <i>*Extrinsic Outflow Graft Obstruction</i>	<b>EARLY</b> <ul style="list-style-type: none"> <li>• may see transient increases in PI prior to development of more significant occlusion</li> <li>• Consider CTA of chest or echo</li> </ul>	<b>LATE</b> <ul style="list-style-type: none"> <li>• Evaluate CVP</li> <li>• Consider CTA of chest or echo</li> <li>• Is pump hum present?</li> <li>• Is the patient in heart failure or shock?</li> <li>• Notify Cardiovascular Surgery and interventional-may need surgical or cath intervention</li> <li>• Consider medical thrombolysis if thrombus suspected</li> </ul>
<b>Aortic Insufficiency</b> MAP ↓ SV02 ↓	<b>***WILL NOT SEE HIGH PI***</b>	<ul style="list-style-type: none"> <li>• Associated with HIGH FLOW</li> <li>• Results in low afterload for the pump</li> <li>• Assess patient symptoms and echo</li> </ul>