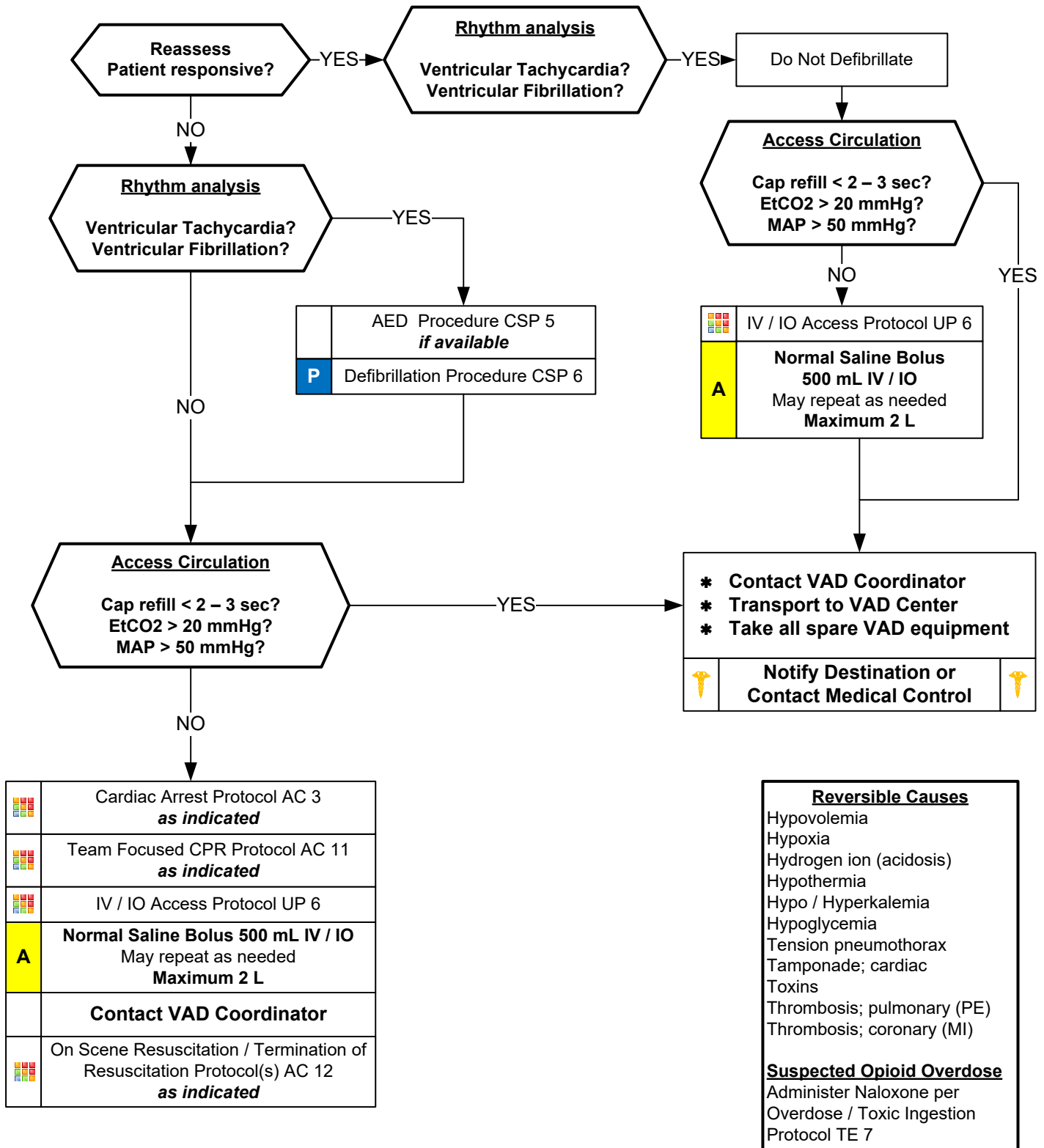


# Mechanical Circulatory Support LVAD, RVAD, and Bi-VAD



# Left Ventricular Assist Device LVAD Unresponsive or AMS



## Pearls

- \* **Recommended exam:** Mental status, skin color, capillary refill, peripheral pulses, blood pressure.
- \* **Assessment of blood flow and perfusion status:**
  - Optimal BP attained by manual BP and Doppler.
  - Automated BP devices can measure a BP in about 50% of attempts and is not reliable to assess perfusion
  - A MAP of  $\geq 60$  mmHg is adequate for most LVAD patients.
  - Skin color, skin temperature, capillary refill
- \* **Mechanical Circulatory Support devices:**
  - LVAD – Left Ventricular Assist Device
  - RVAD – Right Ventricular Assist Device
  - BiVAD – Biventricular Ventricular Assist Device
  - TAH – Total Artificial Heart
- \* **Reasons for use:**
  - Bridge therapy – patients awaiting transplant or anticipated recovery.
  - Destination therapy – advanced heart failure, not candidate for transplant, and will live rest of life with device.
- \* **Pump type and assessing pulses:**
  - Pulsatile flow pumps – older units, not commonly in use now, but generate blood flow with a pulsatile flow and patient will have a palpable pulse.
  - Continuous flow pumps – majority of pumps now used and create blood flow in a continuous stream, no pulsatile flow, so patient will not have a palpable pulse.
  - Most devices are implanted inside the chest and have an internal pump, a driveline connected from the pump to the controller unit, and a power source consisting of batteries and electrical cord for receptacles.
- \* **Common complications:**
  - Disconnection of power supply, either battery disconnect, or electrical cord to receptacle disconnection.
  - Driveline failure or disconnection from controller unit.
  - Controller failure
  - Blood clot formation, acute stroke, and bleeding (mucosal and gastrointestinal most common sites)
  - Infection
- \* **Abnormal heart rhythm:**
  - Pseudo-PEA: Normal cardiac electrical activity in a patient who is alert and well perfused with no palpable pulse.
  - Tachyarrhythmias are usually well tolerated.
- \* **End Tidal CO<sub>2</sub> (EtCO<sub>2</sub>)**
  - If EtCO<sub>2</sub> is  $< 10$  mmHg, improve chest compressions. Goal is  $\geq 20$  mmHg.
  - If EtCO<sub>2</sub> spikes, typically  $> 40$  mmHg, consider Return of Spontaneous Circulation (ROSC)
- \* **Transcutaneous Pacing:**
  - Pacing is NOT effective in cardiac arrest and pacing in cardiac arrest does NOT increase chance of survival