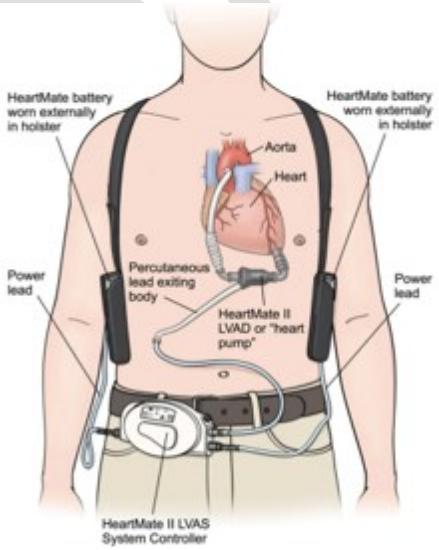
2.19 ~~LEFT~~ VENTRICULAR ASSIST DEVICE (~~L~~VAD)

EMSAC AUGUST 2026

GENERAL ASSESSMENT

- Implantable ventricular assist devices (VAD), include left ventricular assist device (LVAD), right ventricular assist device (RVAD) or biventricular-assist device (BiVAD), are surgically implanted mechanical pump that takes over or assists the heart's pumping function
- First assess the patient and not the device. The problem may not be with the VAD but another medical condition
- Patients with VAD may NOT have a reliable **pulse,** blood pressure or pulse oximetry Consider other parameters as evidence of adequate perfusion such as: ~~for patient assessment and hypoperfusion are important:~~
    - Level of consciousness
    - Capillary refill/skin signs
    - EtCO2 readings will still be accurate
- Assess the device:
    - Auscultate for pump sound or "hum"
    - Check the VAD connections
    - Check device alarms. ~~If the pump is pumping the problem is usually the patient, not the device.~~
    - Check device, refrigerator or medical alert bracelet for specific information regarding the type of device, implantation hospital and/or VAD Coordinator:
        - UCSF: (415) 353-2873
        - CPMC Van Ness: (415) 600-4051. For after hours (415) 487-8480
        - Stanford: (650) 498-9909. For after hours (650)-724-9400



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BLS MANAGEMENT

• For non-VAD or VAD-related complications, expedite transport to the medical facility where VAD was placed. BYPASS the closest San Francisco LVAD Center to get the patient to the VAD Center that implanted their device no matter the patient's condition. If the VAD Center that implanted the device is not in San Francisco, take the patient to the closest San Francisco based VAD Center
• CPR should be initiated when:
  ◦ No evidence of valid DNR/POLST documentation (see **Policy 4051**)
  ◦ Confirmation the pump has stopped and troubleshooting efforts to restart have failed
  ◦ Signs of hypoperfusion (unresponsive, poor refill etc)

ALS MANAGEMENT
• If signs of hypoperfusion AND arrythmia, follow appropriate cardiovascular condition-specific protocols as indicated (e.g. **Tachycardia, Bradycardia** etc) • If patient has a functioning VAD and there is clinical concern for hypovolemia~~-dehydration hypoperfusion~~:   ◦ IV/IO with **Normal Saline**
COMMENT

• ~~You do not need to~~ AVOID disconnecting the controller or batteries to:
  ◦ Defibrillate or cardiovert
  ◦ Acquire a 12-lead ECG
• Ventricular fibrillation, ventricular tachycardia or asystole/PEA may be the patient's "normal" underlying rhythm. Evaluate clinical condition and provide care in consultation with VAD coordinator. You may follow VAD coordinator medical orders relevant to patient care if they are aligned with your scope of practice
• The patient's back-up controller and spare batteries should be transported with patient
• Other common VAD complications may include infection, stroke/transient ischemic attack (TIA), bleeding, arrythmia, cardiac tamponade

BASE HOSPITAL CONTACT
• Do NOT delay initiation of resuscitative efforts if not otherwise contraindicated while awaiting base contact • To pronounce death, if criteria for death in the **field determination criteria (4049)** is not met

~~**FIELD TREATMENT CONSIDERATIONS FOR PATIENTS WITH A LEFT VENTRICULAR ASSIST DEVICE (LVAD)**~~

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1. ~~Call the LVAD Center (open 24/7) per patient or patient's caretaker's contact to get advice on caring for the patient.~~
   - ~~You are authorized to take orders from professionals at the LVAD Center, as long as they are within your scope of practice.~~
   - ~~Contact the Base Hospital with questions or if directed by patient's caregiver or LVAD Center personnel to do something outside of your protocol.~~
   - ~~Have a provider not actively engaged in resuscitation contact the patient's LVAD center.~~

2. ~~Attempt to locate a POLST form. Many patients have made end-of-life care decisions.~~

3. ~~Provide pre-hospital care to the patient in a manner consistent with ALS and BLS treatment protocols for the patient's condition with the following exceptions:~~
   - ~~**Arrhythmias**: Do not disconnect power source, defibrillate per ACLS protocol.~~
   - ~~DO follow the directions of the patient's caregiver when moving and transporting the patient.~~

4. ~~The **LVAD** replaces the pumping action of the left ventricle via a continuous blood flow mechanism, where there is no filling or emptying phase.~~
   - ~~As a result, patients commonly have **NO PALPABLE PULSE, NO OBTAINABLE PULSE OXIMETRY OR BLOOD PRESSURE**, and only a "mean" arterial pressure detectable using a Doppler if available.~~
   - ~~An LVAD patient's ECG heart rate will differ from the pulse rate since the LVAD is not synchronized with the native heart rate.~~

5. ~~Assess the patient's airway and intervene per protocol. If you are unable to obtain pulse oximetry readings, you should assume the patient is hypoxic and place the patient on supplemental oxygen.~~

6. ~~If the patient has an altered level of consciousness, immediately check for end-tidal CO2 using capnography. Auscultate heart sounds to determine if the device is functioning. You should expect to hear a continuous "whirling" sound for most devices.~~

7. ~~Assess the device for any alarms / malfunctions. Check with patient or caregivers for device reference materials or contact the VAD Center.~~

8. ~~If hypovolemia is suspected, start at least 1 large bore IV, and give a 1L **Normal Saline** fluid bolus.~~

9. ~~Always transport the patient to the LVAD Center that implanted the device (UCSF or CPMC-Van Ness). You are authorized to BYPASS the closest San Francisco LVAD Center to get the patient to the LVAD Center that implanted their device no matter the patient's condition. If the LVAD Center that implanted the device is not in San Francisco, take the patient to~~

~~the closest San Francisco based LVAD Center.~~

- ~~Bring **ALL** of the patient's equipment, including extra batteries and battery charger if available. Bring the patient's caregiver to act as the information resource on the device. You are authorized to use the caregiver as an information resource on the device.~~

10. ~~Upon arrival to Emergency Department, immediately plug in the device into an electrical socket.~~

11. ~~If cardiac AND LVAD device failure is suspected, manual or mechanical chest compressions may be initiated. A LUCAS device may be used for a patient with an LVAD assuming no other LUCAS device contraindication.~~

12. ~~Call the Base Hospital for field determination of termination if resuscitation criteria are otherwise met.~~

DRAFT