

**COUNTY OF SACRAMENTO
EMERGENCY MEDICAL SERVICES AGENCY**



Program Document: **Ventricular Assist Device (VAD)**

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Signature on File

EMS Medical Director

Signature on File

EMS Administrator

Purpose:

- A. To establish a treatment standard for treating patients with a Ventricular Assist Device (VAD).
- B. This policy applies to VADs for left, right, and both ventricles (LVADs, RVADs, and BiVADs)

Authority:

- A. California Health and Safety Code, Division 2.5
- B. California Code of Regulations, Title 22, Division 9

Protocol:

BLS:

- 1. Supplemental O2 as necessary to maintain SpO2 $\geq$ 94%. Adjust flow and delivery mode as needed.
- 2. Airway adjuncts as needed.
- 3. If the patient is unresponsive, check the power supply and the connections.
- 4. Chest Compressions ONLY if unresponsive, apneic, Systolic Blood Pressure (SBP)
- 5. < 60 mmHg and VAD is presenting with a Red Heart Alarm.
- 6. Collect all VAD equipment (power unit, spare batteries, and black emergency bag).
- 7. Transport patients experiencing VAD-related problems to the appropriate receiving facility providing VAD services. Patients who meet critical trauma criteria or have severe burns shall be taken to UC Davis.

ALS:

1. Advanced airway adjuncts as needed.
2. If auscultated SBP (see precautions A) is less than 60 mmHg, pulmonary edema is not present and patient exhibits symptoms such as dyspnea, hypotension, syncope, and loss of consciousness, then:
 - a. Establish Intravenous access with Normal Saline and titrate to an SBP of 70 mmHg not exceeding 1500 ml of fluid.
3. If patient remains unconscious with SBP of < 50 mmHg after IV fluid, begin CPR.
4. Patients with total artificial hearts (BiVADs) do not respond to CPR and should not receive medication or CPR.
5. Cardiac Monitoring.
6. Defibrillation and/or cardioversion are indicated for shockable rhythms.

NOTE: Patients with mechanical devices in ventricular tachycardia or ventricular fibrillation may still have a perfusing rhythm and be conscious; these patients should **NOT** receive CPR.

Considerations:

- A. The two (2) most common causes of VAD pump failures are disconnection of the power and failure of the driveline.
- B. VAD patients will not have a systolic and diastolic blood pressure in the absence of a pulse. The blood pressure can be palpated or auscultated with a 70-90 mmHg as an acceptable range. Automatic blood pressure cuffs are not reliable when used on a VAD patient.
- C. Chest compressions and blunt thoracoabdominal trauma can disrupt the anastomoses between the left ventricle, VAD, and the ascending aorta.
- D. Loss of cardiac output from VAD failure and a "red heart" alarm may present patient symptoms such as dyspnea, nausea, hypotension, syncope, loss of consciousness, or pulmonary edema.
- E. The patient or caregiver may be able to interpret any VAD controller unit alarms.
- F. Do not separate the patient from the caregiver. The caregiver is trained in managing the VAD equipment.
- G. VAD patients may also have an Implanted Cardioverter-Defibrillator (ICD) or pacing ICD.
- H. Blood pressure and pulse oximetry may not be measurable.

- I. Cardiac monitoring heart rate will differ from the pulse rate since the VAD is not synchronized with the native heart. The pulse rate reflects the rate supporting perfusion.

NOTE: Reference for additional information:

The International Consortium of Circulatory Assist Clinicians Mechanical Circulatory Support Emergency Guide 2020-2021: [ICCAC Emergency Guides 2021](#)

VAD Program Coordinator will likely be in contact with the patient/caregiver by phone and can be used as a resource in determining if the presenting chief complaint is a pump-related problem or a patient-related problem.