

	<b>COUNTY OF SACRAMENTO</b> EMERGENCY MEDICAL SERVICES AGENCY	Document #	8833.10
	PROGRAM DOCUMENT:  <b>Ventricular Assist Device (VAD)</b>	Initial Date:	08/01/10
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EMS Medical Director

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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:**

<b>BLS</b>
<ol style="list-style-type: none"> <li>1. Supplemental O<sub>2</sub> as necessary to maintain SpO<sub>2</sub> ≥ 94%. Adjust flow and delivery mode as needed.</li> <li>2. Airway adjuncts as needed.</li> <li>3. If the patient is unresponsive, check the power supply and the connections.</li> <li>4. Chest Compressions <b>ONLY</b> if unresponsive, apneic, Systolic Blood Pressure (SBP) &lt; 60 mmHg and VAD is presenting with a Red Heart Alarm.</li> <li>5. Collect all VAD equipment (power unit, spare batteries, and black emergency bag).</li> <li>6. 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.</li> </ol>
<b>ALS</b>
<ol style="list-style-type: none"> <li>1. Advanced airway adjuncts as needed.</li> <li>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:           <ul style="list-style-type: none"> <li>• Establish Intravenous access with Normal Saline and titrate to an SBP of 70 mmHg not exceeding 1500 ml of fluid.</li> </ul> </li> <li>3. If patient remains unconscious with SBP of &lt; 50 mmHg after IV fluid, begin CPR.</li> <li>4. Patients with total artificial hearts (BiVADs) do not respond to CPR and should not receive medication or CPR.</li> <li>5. Cardiac Monitoring.</li> <li>6. Defibrillation and/or cardioversion are indicated for shockable rhythms.</li> </ol>

**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 20 21.pdf](#)

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.