

## VENTRICULAR ASSIST DEVICE (VAD)

### **BLS ACTION/TREATMENT:**

- Stabilize:
  1. Airway, Breathing, Circulation
    - Hand pump in first generation (displacement pulsatile) VADs with 'red heart' alarm
    - External chest compressions ONLY if unresponsive, apneic, pulseless and 'red heart' alarm in second generation (turbine nonpulsatile) VADs.
  2. Administer oxygen.
- Assessment:
  1. Vital signs (BP, respiratory rate).

Note: BP and pulse oximetry may not be measurable with and may not reflect the function of second generation (turbine nonpulsatile) VADs depending on native heart function.
  2. The patient or caregiver will interpret any VAD controller unit alarms.
- History:
  1. VAD Program Coordinator will likely be in contact with the patient and/or caregiver by telephone. This resource may be able to determine whether the presenting chief complaint is a pump-related problem or a patient-related problem.
  2. Establish whether the VAD can be operated with a hand pump.

### **ALS ACTION/TREATMENT:**

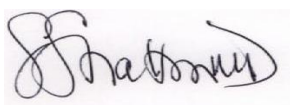
- Monitor any cardiac rhythm and document with rhythm strip (or 12-lead ECG if indicated).

Note: The ECG heart rate will be different from the pulse rate since the VAD is not synchronized with the native heart. The pulse rate reflects the rate supporting perfusion.
- IV access.
- No ALS drugs are contraindicated; treat symptoms and signs according to applicable treatment guidelines. Defibrillation/cardioversion pads placement is not affected by the LVAD.
- For pulmonary edema with hypotension and 'red heart' alarm initiate hand pumping in first generation (displacement pulsatile) VADs.
- For hypotension without pulmonary edema give a fluid challenge of 250 mL normal saline for an adult or 20 mL/Kg for a child.

**Boxed text indicates BH order**

Unboxed text indicates standing order

Approved:



Treatment Guidelines: Cardiac: C-50  
Implementation Date: 3/28/11

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- Collect all VAD equipment including the power base unit, spare batteries, spare controller unit and hand pump (for first generation VADs) as directed by the caregiver and VAD Program Coordinator (if on the telephone) and transport with the patient and caregiver.
- Do not separate the patient from the caregiver. The caregiver will be trained in managing the VAD equipment.
- Transport to the closest appropriate PRC. This may be a PRC with which the patient has a relationship through the VAD Program.

### Notes

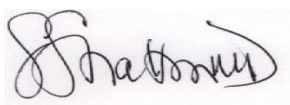
- Thoratec HeartMate™ VADs operate either as a pulsatile displacement pump (first generation) or as a nonpulsatile axial turbine (second generation).
- The 'red heart' alarm is a visual and audible red broken heart symbol indicating VAD pump failure and is an emergency. A 'yellow wrench' alarm symbol indicates a problem with the VAD pump or controller unit but VAD cardiac output is sustained.
- Loss of cardiac output from VAD failure and a 'red heart' alarm may present as dyspnea, nausea, hypotension, syncope, loss of consciousness or pulmonary edema. In the absence of a 'red heart' alarm look for other causes.
- Ventricular dysrhythmias may continue to perfuse through the VAD pump.
- External chest compressions and blunt thoracoabdominal trauma can disrupt the anastomoses between the left ventricle, VAD and ascending aorta.
- VAD patients may also have an Implanted Cardioverter-Defibrillator (ICD) or pacing ICD.

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