

Ventricular Assist Device (≥ PL2)

Clinical Indications:

1. Emergency response to a patient with a Ventricular Assist Device (VAD), Left Ventricular Assist Device (LVAD).

Contraindications:

1. None.

Notes/Precautions:

1. A VAD is a mechanical pump that is used to support heart function and blood flow in people who have weakened hearts. Some common reasons for VAD implantation are MI, Heart Failure, myocarditis, cardiomyopathy and heart surgery.
2. The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.
3. The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver blood to your body; and a power source.
4. The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD functions. The batteries are carried in a case usually located in a holster in a vest around the patient's shoulders.
5. The control unit gives warnings or alarms if the power is low or if it senses that the device is not functioning properly.
6. VAD patients are preload dependent, a fluid bolus can often reverse hypoperfusion.
7. Most patients have a tag located on the controller around their waist that lists the type of device, the institution that put it in and a number to call.
8. Be careful removing or cutting clothing so you do not dislodge or cut the drive line.
9. Questions to ask:
 - a. Does the patient have a DNR?
 - b. Can the patient be cardioverted or defibrillated if needed?
 - c. Can chest compressions be performed in case of pump failure?
10. If a VAD patient is unresponsive and pulseless with a non-functioning pump and has previously indicated a desire for resuscitative efforts, begin compressions. Contact the VAD coordinator and OLMC.
11. Call the VAD Coordinator early as they are available 24/7.

Procedure:

1. Assess patient's airway and intervene per airway clinical guidelines.
2. Auscultate heart sounds to determine if the device is functioning and what type of device it is. If it is a continuous flow device you should hear a whirling sound.
3. Assess the device for any alarms.
4. Look at the controlled located around the patient's waist or in their VAD PAK to see what device it is.
5. Intervene appropriately based on the type of alarm and patient guide.
6. You may follow standard cardiac arrhythmia guidelines, except:
 - a. Do not perform chest compressions, unless directed by OLMC.
 - b. Do not administer thrombolytics
7. Defibrillation and cardioversion are the standard processes.
8. Assess vital signs, use mean BP with doppler if available. The first sound you hear is the mean arterial pressure. If no doppler, then use the NIBP cuff.
9. Transport to closest VAD Center. Call the number listed on the device for advice.
10. Bring all of the patient's equipment and paperwork to the ED.
11. Allow the trained caregiver to ride in the patient compartment when possible. They may be able to serve as an expert on the device if the patient is unconscious or unable to answer for themselves.

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Pearls:

1. Always talk to family and caregivers as they may have specific knowledge and skills.
2. Deciding when to initiate chest compressions is difficult. Consider that chest compressions may cause exsanguination if the device becomes dislodged. However, if the pump has stopped the heart will not be able to maintain perfusion and the patient will likely die. Ideally, plan the decision advance with a responsive patient, the VAD coordinator, and OLMC.
3. Common complications in VAD patients include Stroke and TIA, bleeding, dysrhythmia, and infection.
4. The cardiac monitor and 12-lead ECG are not affected by the VAD and will provide important information.
5. Defibrillate and/or cardiovert as normal and do not place the pads over the device.
6. Keep in mind it may be difficult to obtain an accurate SpO₂
7. Transport patients with all device equipment including any instructions, hand pumps, backup batteries, primary and secondary controllers, as well as any knowledgeable family members or caregivers.