Ventricular Assist Devices

- Ventricular Assist Devices are implanted devices used to partially or completely replace the pumping function of a failing heart.
- VAD’s are used both as a bridge device while patients are awaiting heart transplant and are now increasingly being used permanently (called destination therapy).
Ventricular Assist Devices

- Devices are either pulsatile or continuous flow.
- Ventricular Assist Devices are further divided in Left Ventricular Assist Devices (LVAD), Right Ventricular Assist Devices (RVAD) or both ventricles (BiVAD).
- The more common device is a continuous flow-pump located in the patients thorax attached to the patients left ventricle and aorta (LVAD).
Ventricular Assist Devices

O Remember, assess the **PATIENT**, not the device. The reason for the call may not be a problem with the VAD.

O VAD patients **usually** have a family/caretaker with them 24/7 who has had training for their devices and they should be capable of basic troubleshooting of the device.
Ventricular Assist Devices

- Patient assessment may not be straightforward with VAD patients.
- Common Assessment findings:
  - Patients with continuous flow VAD’s “typically” have no discernible pulse or blood pressure. If a pulse is palpable, it may not correspond with the heart rate on the monitor.
  - Blood pressures are usually not able to be obtained with either manual or automatic blood pressure devices.
  - Pulse oximetry will either be absent or unreliable.
  - Utilize other parameters for patient assessment: Level of consciousness, skin signs, cap refill, end-tidal CO2 monitoring, etc.)
Ventricular Assist Devices

- 12-Lead ECG will show native heart rhythm and will not necessarily reflect the patient’s circulatory status.

  Pt. may be in awake and in ventricular fibrillation!

- Patients may be cardioverted or defibrillated if symptomatic, but asymptomatic dysrhythmias do not require treatment.

- VAD’s are preload dependent. Dysrhythmias that would affect preload (e.g. SVT, A-Fib with RVR, V-Tach and V-Fib) need to be treated.

- Patient may also have a ICD or Pacemaker/ICD.
Ventricular Assist Devices

- C-A-B for VAD
  - Circulation (NO CPR!)/Connections
  - Airway
  - Breathing
Ventricular Assist Devices

- VAD devices may become dislodged with chest compressions and may lead to massive hemorrhage.

Do not perform chest compressions on patients with VAD’s, even if the patient is unconscious.

- Contact the Base for further direction if any question.
Ventricular Assist Devices

- Connections:
  - Utilize caretaker/family member and VAD Coordinator for issues with VAD alarms and connections. *Listen to their direction on the VAD equipment.* There is more than one manufacturer of ventricular assist devices, each with their own special set of instructions.
  - VAD systems generally have two battery packs and at least one needs to be in place at all times.
Ventricular Assist Devices

Treatment:

- Treatment of patients with VAD’s should follow appropriate treatment guidelines with the exception of CPR.
- Medical direction should be provided by the base hospital, not the VAD coordinator. It is suggested that both the base hospital and the VAD coordinator are contacted simultaneously, if the family has not already contacted the VAD Coordinator prior to EMS arrival.
- Family members and caretakers are valuable resources.
Ventricular Assist Devices

- Destination Decision
  - In most circumstances, when transport is indicated, the appropriate destination for the patient is the hospital where the VAD was implanted and the patient is managed.
  - Contact the base hospital if there are questions concerning destination.
  - If possible, the patient’s family member or caregiver should accompany the patient in the ambulance.
  - Bring all equipment associated with the VAD with the patient to the hospital.

There are no contraindications to VAD patients being transported by helicopter.
Ventricular Assist Devices

- Take away...
  - Treat the patient, not the device.
  - Assessment parameters are different.
  - Call Base hospital/VAD coordinator simultaneously.
  - If cardiac arrest check for DNR/POLST.
  - NO CPR compressions!
  - Transport to implanting facility when possible.