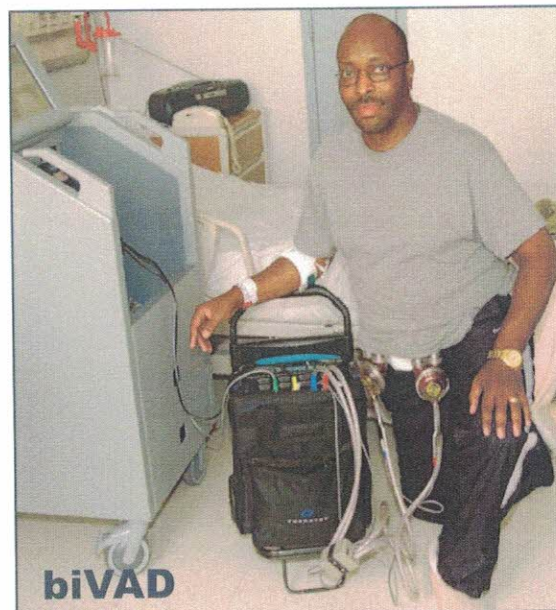


Thoratec PVAD™ w/TLC II Driver

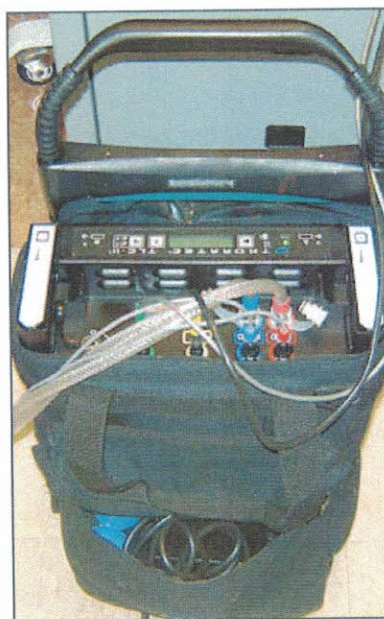
1. Can I do external CPR?
No.
2. If not, is there a "hand pump" or external device to use?
Yes, find the blue or red hand bulbs.
3. If the device slows down (low flow state), what alarms will go off?
Low flow alarms: Loss of fill alarm will occur
4. How can I speed up the rate of the device?
Give volume of IV fluids.
5. Do I need to heparinize the patient if it slows down?
Only if it stops. Patient will be anti coagulated on Coumadin.
Only heparinize if the pump stops.
6. Can the patient be defibrillated while connected to the device?
Yes. Nothing needs to be disconnected. Patient should be placed on battery power BEFORE defibrillation.
7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
No. If the defibrillation is unsuccessful, disconnect pump and continue to defibrillate.
8. Does the patient have a pulse with this device?
Yes.
9. What are acceptable vital sign parameters?
Normal blood pressure parameters.
10. Can this patient be externally paced?
Usually in BiVAD configuration, if yes the ECG not important to treat.
Because both sides of the heart are supported, there is little need to pace regardless of the rhythm seen on ECG.

- These patients have biventricular support through 2 pumps: right and left.
- EKG will NOT correlate with the patient's pulse.
- Patient may be in any arrhythmia, but because they have biventricular support — DO NOT TREAT arrhythmias. Only RVAD or LVAD patients should be treated for arrhythmias.
- Bring all extra batteries & electrical adaptor along during transport. This system is electrically driven.
- The pumps are driven by a compressor called the TLC II driver. The pneumatic hoses and cables plug into the top of the TLC II driver.
- If the Driver loses power, malfunctions, or stops, use the hand pump(s). (hand pump instructions on back of this page)
- Continue hand pumping and then, as soon as possible, replace the TLC II Driver with the backup Driver.
- Backup Driver accompanies the patient at all times. (Driver replacement instructions on back of this page)
- **WARNING:** If the pump has stopped and blood is stagnant in the device for more than a few minutes (depending on the coagulation status of the patient), there is a risk of stroke or thromboembolism. BEFORE the device is restarted or hand pumping is initiated, contact the implanting center for anticoagulation direction.



IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

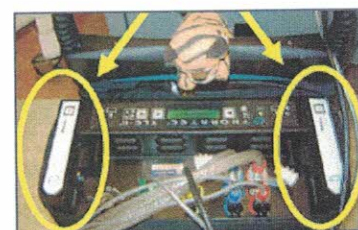
Adapted from Sweet, L. and Wolfe, Jr., A. Mechanical Circulatory Devices in Transport in ASTNA: Patient Transport Principles and Practice, 4th ed., Mosby, 2010 in press.



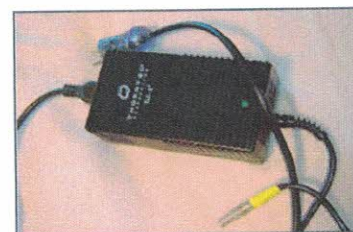
TCL-II Driver



Battery Charger



Batteries loaded into battery slots on TLC-II Driver



AC Power adapter – plug into yellow port on driver

PVAD/IVAD

Type of Device: pulsatile

What is an LVAD?

Left Ventricular Assist Devices are pumps surgically attached to patients' hearts to pump blood for the ventricle. There are three basic parts to all VAD systems. The pump, a computer with lamps and alarms, and a power source.

Why do patients get VADs?

Patient who have been treated for heart failure but in spite of optimal care continue to suffer from life limiting heart failure. Patients may be on the heart transplant list but the transplant team is worried the patient may die before a suitable donor is found, bridge to transplant. Pts who are not candidates for transplant but suffer from end stage heart failure may also be implanted as destination therapy.

How do VADs work?

Most vads implanted nationally create continuous flow. Blood comes from patients own ventricle into the pump then a turbine like spinning fan pushes the blood out into the aorta then the body. A cable connects the pump inside with the computer/controller and batteries outside the body. The pump needs a constant power supply.

biVAD



IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

Do's

1. Page the On Call Perfusionist. Call the Tower OR at 3316 to ask for the beeper number.
2. Give whatever medications you want. (no medication contraindication)
3. Defibrillate if indicated
4. Hand pump only if the device has stopped pumping, left faster than right.

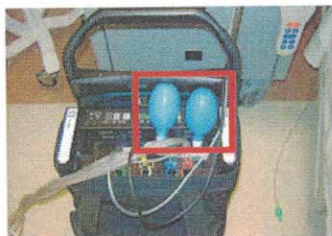
Don'ts

1. NO CHEST COMPRESSIONS.
2. NO MRI.
3. Don't panic if the ECG is at one rate. The LVAD rate is at another, and the RVAD rate is a third.

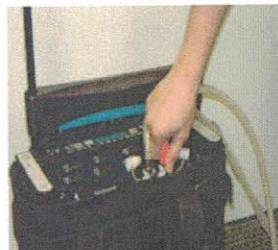
Questions:

1. CPR: NO
2. Hand pump: yes called hand bulbs
3. low flow alarms: Loss of Fill alarm
4. speed up device: fluids
5. heparin: only if it stops. Patient has to be on Coumadin
6. defib: yes
7. disconnect for defib: no
8. pulse: yes
9. Vital signs: Normal BP parameters
10. externally pace: Usually in Bi VAD configuration if yes the ECG not important to treat

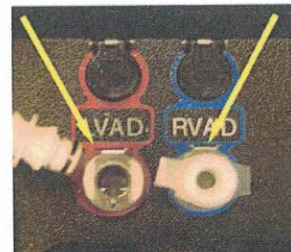
Hand Pumping Instructions



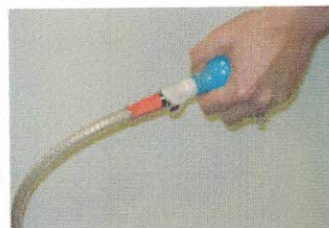
Step 1: Obtain hand pump(s) from carrying case. Note: One (1) hand pump is needed for each VAD.



Step 2: Depress metal clip(s) to disconnect the pneumatic lead(s) from the TLC II Driver.



Step 3: Connect the hand pump(s) to the pneumatic lead(s).



Step 4: Squeeze hand pump(s) once per second. Use your foot if necessary.

Note: For 2 VADs (BiVADs), squeeze each hand pump at the same rate. Never hand pump the right VAD (RVAD) faster than the left VAD (LVAD), as this may cause pulmonary edema.

Switching to Backup TLC-II Driver

Step 1: Insert a fully-charged battery (stored in carrying case) into each battery slot of backup TLC-II driver.

Step 2: Turn on key switch

Step 3: Depress metal clip(s) to remove white occluder from pneumatic port(s) :

- LVAD port is **RED**.
- RVAD port is **BLUE**.
- Note: for BiVADS, switch LVAD first. Do NOT remove occluder caps from both ports at the same time (or from unused port during single VAD support), or system will depressurize.

Step 4: Disconnect pneumatic lead(s) from primary Driver (or hand pump) and connect to backup Driver.

Step 5: Disconnect electric lead(s) from primary Driver and connect to backup Driver.

Step 6: Place Driver in AUTO mode, if necessary. Note: Backup Drivers are preprogrammed with a patient's unique settings.

Step 7: Verify full signal(s) is/are ejecting completely.

Step 8: Remove key and place in carrying case pocket.

Step 9: Connect to external power, if available by using the AC power adapter cord.

**All modes of emergency transport are acceptable for VAD patients.
Aviation electronics will NOT interfere with VAD operation (and vice versa).**

Air Transport Consideration: In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet-when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.