



TO: Riverside County EMS System Participants

October 5, 2011

FROM: Humberto R. Ochoa, MD, Medical Director
Riverside County EMS Agency

HRO

Ventricular Assist Devices (VADs) are becoming a more common treatment for cardiac failure. EMS personnel are likely to encounter such patients in their daily practice. EMS personnel should be able to recognize Ventricular Assist Devices, identify patient specific complications, hemodynamic differences and appropriate interventions and management.

VADs are a bridge therapy to heart transplantation, bridge to recovery, or may even be destination therapy for patients in severe congestive heart failure. Use of the VAD has allowed many of these patients to not only return home, but to travel beyond their community. These patients are not bound to residential requirements. They can lead very active lifestyles and can live several hours away from the hospital that implanted the device.

When hospitals implant these devices, they send the patient home with a caregiver who has received extensive education in the VAD, as well as a 24/7 telephone number to call in the event of an emergency. The caregiver is instructed to contact the VAD Coordinator for any problem, and to call 9-1-1 in an emergency.

Many VAD patients will not have a peripheral pulse. This presents a challenge for EMS personnel who respond to these patients because usual assessment techniques for evaluating the patient's condition, such as checking the patient's pulses and evaluating pulse oximetry, do not apply. Field assessment should include other assessment techniques, such as skin signs, level of consciousness, and general appearance. Many VAD patients have made end-of-life care decisions; look for or inquire about a DNR or a POLST form.

EMS personnel should contact the Base Hospital immediately and give the MICN the telephone number for the VAD Coordinator, which is provided to the VAD patient and their caregiver. The VAD Coordinator and the VAD patient's caregivers, as well as the patient themselves, are the best resources for EMS personnel and hospitals. Although the VAD Coordinator is an excellent resource, EMS personnel should remember that they are not able to accept orders from anyone other than a Base Hospital.

VENTRICULAR ASSIST DEVICES (VADs)

TWO MAIN TYPES

<u>Pulsatile</u>		<u>Non-Pulsatile</u>
<ul style="list-style-type: none"> • Flexible pumping chamber 	MECHANISM	<ul style="list-style-type: none"> • Impeller (turbine-like rotor blade)
<ul style="list-style-type: none"> • First Generation 	TECHNOLOGY	<ul style="list-style-type: none"> • Newer technology – 2nd generation
<ul style="list-style-type: none"> • Left (LVAD), Right (RVAD), or both ventricles (BiVAD) 	PLACEMENT	<ul style="list-style-type: none"> • Almost always LVAD
<ul style="list-style-type: none"> • Noisy – device is audible • Patient will have a pulse • Patient will have a blood pressure 	ASSESSMENT	<ul style="list-style-type: none"> • Quiet – provider must listen with stethoscope over apex • Usually no palpable pulse. If there is a pulse, it can be weak and/or irregular • Usually no measurable blood pressure. If there is a blood pressure, it will be via Doppler, and will be a single number, a Mean Arterial Pressure (MAP) <ul style="list-style-type: none"> ○ Ideal range is 65 – 90 mmHg ○ Families/caregivers will know the proper MAP • It is important to use assessments other than heart rate and regularity. <ul style="list-style-type: none"> ○ Check skin signs, LOC, etc.

Basic VAD Management:

1. Alarms

- a. “Yellow” light alarm has intermittent beeping sounds.
 - i. Not critical, but the device requires attention.
 - ii. Likely due to low battery, cable disconnected, or device not functioning properly.
- b. “Red” alarm has a loud, continuous shrill sound.
 - i. Device needs immediate attention.
 - ii. Often due to the pump stopped or a problem is detected with the system controller.

Field Management

1. Check system

- a. Ensure all connections are hand tight and intact.
- b. Check battery to ensure it is functioning.
- c. If all is intact, the problem is probably the patient rather than the device.

2. Start an IV and prepare for fluid resuscitation as directed by Base Hospital.

3. Apply oxygen as clinically indicated.

4. ECG will show the native heart rhythm.

5. All VAD patients have a caregiver who has been extensively trained on the VAD.

- a. ***Always allow the caregiver to accompany the patient in the ambulance to help facilitate care.***

6. Bring all VAD equipment to the hospital with the patient.

7. The VAD is insulated and will not be damaged by defibrillation.

8. Avoid nitrates in VAD patients; they lower preload.

9. Avoid aspirin in VAD patients; they are already anticoagulated.

10. All ACLS medications are approved for use in a VAD patient.

11. **Chest compressions should be avoided in VAD patients.**

12. VAD patients frequently have an Implanted Cardioverter Defibrillator (ICD) or a Pacemaker/ICD.

- a. Pass this info on to the base hospital.

13. VAD patients frequently have a DNR, Advance Directive, or POLST form.