

**4402****Mechanical
Circulatory Support
Devices****Treatment Protocol**Last Reviewed: **October 4, 2022**Last Revised: **December 2, 2022****PURPOSE:**

To describe the medical orders that EMS personnel must follow during care of the mechanical circulatory support device patient. These medical orders are performed under medical direction by the Riverside County EMS Agency (REMSA) Medical Director through this written / standing order. These medical orders may also be provided, modified, and/ or supervised by the mobile intensive care nurse (MICN) and/or base hospital physician (BHP) through on-line (remote verbal order) or on-scene procedure authorization. The REMSA Medical Director is responsible and accountable for medical control of the EMS system. Each MICN and BHO is responsible and accountable for medical direction given to EMS personnel.

Mechanical Circulatory Support Devices: Comparison

Ventricular Assist Device (VAD)	Total Artificial Heart (TAH)
Usually pulseless	Pulsatile
ECG shows native heart rhythm	ECG is meaningless because there is no heart
Do NOT administer NTG	NTG may be administered for systolic blood pressure greater than 140 mmHg
May perform chest compressions for a cardiac rhythm of VF, VT, or asystole	Do NOT perform chest compressions
May cardiovert, externally pace, or defibrillate	Do NOT cardiovert, externally pace, or defibrillate
Must auscultate the left upper quadrant of the patient's abdomen for the "hum" of the VAD	The TAH's Freedom Driver is audible without a stethoscope, making a "galloping" type of sound
Will usually have an ICD	Will not have an ICD
May be able to obtain a Mean Arterial Pressure (MAP) using a Doppler device only. Normal sphygmomanometer will not work. MAP should be from 70 – 85 mmHg	Blood pressure is obtainable utilizing a normal sphygmomanometer

BLS Patient Management

- **Establish, maintain, and ensure:**
 - A. A patent and easily managed airway. Use manual maneuvers (head-tilt / chin-lift or jaw thrust), oropharyngeal suction and/or airway adjuncts (OPA / NPAs) as clinically indicated
 - B. Adequate respirations and tidal volume. Use a mouth-to-mask device or bag valve mask (BVM), when clinically indicated. Rescue ventilations via a BVM require the use of a manometer. Waveform / digital capnography is required when paramedics are present
 - C. Controlled bleeding. Use direct pressure and/or pressure dressing(s) and/or tourniquet(s) and/or hemostatic dressing(s), as clinically indicated

ALS Patient Management

- Establish, maintain, and ensure peripheral IV and/or IO access for emergency stabilization, and/or as clinically indicated
 - Consider the need for additional sites as clinically indicated
- Do not administer Aspirin or Nitroglycerin to VAD patients

<ul style="list-style-type: none"> • Oxygen As clinically indicated. Titrate to maintain, or increase, SpO₂ to a minimum of 94%. A range of 88-92% is acceptable for patients with a history of COPD • Position the patient as clinically indicated for safety, comfort, and to meet physiologic requirements • CONTACT A SINGLE BASE HOSPITAL AS SOON AS POSSIBLE TO GIVE THEM TIME TO CONTACT THE VAD / MCS COORDINATOR The VAD/MCS Coordinator will assist the base hospital with troubleshooting the equipment Give report and describe any advanced directives (DNR/POLST/DNR medallion) Advise the base hospital of the implanting hospital. For patients from outside of the area, the default Coordinator will be Loma Linda University Medical Center (Main Campus) • The VAD Coordinator(s) cannot provide online medical direction. • Assist the patient's family and/or caregiver with troubleshooting the VAD for disconnection, power or mechanical failure Provide patient care as directed by applicable REMSA treatment protocols with the exception of chest compressions, defibrillation, external pacing or cardioversion in TAH patients Do not assist VAD patients with Aspirin and/or Nitroglycerin administration 	<ul style="list-style-type: none"> • CONSIDER: Normal saline 250 mL IV/IO bolus. MAY REPEAT AS CLINICALLY INDICATED TO A MAX ADMINISTRATION OF 2 L. <i>Volume replacement is the first-line therapy in the pre-load dependent <u>VAD</u> patient</i> • CONSIDER: <i>For amnesic effect in the conscious <u>VAD</u> patient prior to synchronized cardioversion</i> Midazolam 2.5 mg (0.5 mL) slow IV/IO push. ADDITIONAL ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO). **OR** Midazolam 5 mg (1 mL) IM/IN. ADDITIONAL ADMINISTRATIONS REQUIRE A BASE HOSPITAL ORDER (BHO). • CONSIDER: Early and aggressive synchronized cardioversion for the symptomatic <u>VAD</u> patient who is experiencing a preload-disruptive malignant dysrhythmia (i.e., VT with pulses) <ul style="list-style-type: none"> ○ Initial shock – 100j ○ Second shock – 150j ○ Subsequent shocks – 200j • Perform chest compressions on <u>VAD</u> patients only, only in the following circumstances: <ul style="list-style-type: none"> ○ If the patient is unconscious, apneic, and showing VT, VF, or asystole on the ECG monitor ○ If the patient is apneic with cyanosis and the cardiac monitor shows a perfusing rhythm but capillary refill is greater than 3 seconds • Defibrillate at the manufacturer's recommended joule setting for pulseless VT and VF
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Patient Disposition

<ul style="list-style-type: none"> • The base hospital will determine treatment, and destination, while considering the VAD coordinator's recommendations
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