



Central Ohio Trauma System

An affiliate of the Columbus Medical Association

Prehospital Guidelines for the Management of Long Term Mechanical Circulatory Support for Patients in Cardiac Arrest

PURPOSE

These guidelines identify the recommendations for prehospital management of long term mechanical circulatory support (MCS) for patients in cardiac arrest.

SCOPE

These guidelines have been developed by COTS member central Ohio hospitals that treat and discharge patients receiving long term MCS and are intended for use by central Ohio Emergency Medical Services (EMS) that participate in COTS.

Use of these guidelines is voluntary.

These guidelines do not supersede EMS agency protocol. EMS medical directors and leaders are encouraged to seek guidance from local MCS centers for the most up-to-date technologies and protocol assistance.

BACKGROUND

The increased use of MCS in end-stage heart failure requires recommendations for assessing and managing patients in prehospital cardiac arrest.

REFERENCES

American Heart Association (2017). Cardiopulmonary resuscitation in adults and children with mechanical circulatory support: A scientific statement from the American Heart Association. *Circulation*, 135, e1115-e1134. doi:10.1161/CIR.0000000000000504

Nationwide Children's Hospital (2017)

OhioHealth Riverside Methodist Hospital (2017)

Sen, A., Larson, J. S., Kashani, K. B., Libricz, S. L., Patel, B. M., Guru, P. K., & Alwardt, C. M....(2016). Mechanical circulatory assist devices: A primer for critical care and emergency physicians. *Crit Care*, 20(153). doi:10.1186/s13054-016-1328-z

The Ohio State University Wexner Medical Center (2017)

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Prehospital Guidelines for the Management of Long Term Mechanical Circulatory Support (MCS) for the Patients in Cardiac Arrest

ASSESS EQUIPMENT AND CALL MCS/LEFT VENTRICULAR ASSIST DEVICE (LVAD) COORDINATOR

The Ohio State University Wexner Medical Center 614-293-3787
OhioHealth Riverside Methodist Hospital 614-788-2823
Nationwide Children's Hospital 614-355-8237

Patient/Equipment Assessment and Treatment Recommendations

- Treat the patient
- Equipment cannot be removed and cannot get wet
- Check if device is working:
 - Auscultate left upper abdomen for continuous hum sound, hum = working device (sounds may overwhelm the chest cavity)
 - Check power source (consider a change-out with patient's backup equipment)
 - Device may alarm for low flows or other system alarms (ensure all connections are tight and power source is functioning)
 - **DEVICE MAY STILL BE WORKING EVEN WHEN ALARMING, CHECK FOR HUM**
- Patients may not have palpable pulses or measurable blood pressure or pulse oximeter readings even if pump is working
- ACLS treatments and measures apply to the MCS patient with the exception of chest compressions
- If the patient is in cardiac arrest or has altered mental status (AMS) without doppler pulses and the device is NOT functioning:
 - **BEGIN MANUAL CHEST COMPRESSIONS AND CONTACT THE MCS/LVAD COORDINATOR**
 - **NOTE: The use of a mechanical chest compression device is not recommended in MCS patients**
- Chest compressions are only advised when the device is NOT working
- It is acceptable to defibrillate

AMS Signs: Low flow rates=low perfusion, hypotension, stroke, seizures, infections, medications, electrolyte/metabolic imbalance, hypoxia, trauma, hypercarbia, thromboembolic causes

Pediatric Caveats:

- Lower flow rates are required
- Blood pressure potentially more difficult to measure
- Children are at a higher risk for stroke/seizure/neurologic injury than adults and therefore more likely to present in an obtunded state
- Pediatric MCS patients may also have congenital heart disease and may not have normal oxygen saturations, although are most likely $\geq 90\%$ and on room air

Transport Destination Recommendations:

- If the patient is stable, treat per EMS protocol. Assess for other general medical problems and treat as necessary
- If the emergency is not MCS related, transport to a local emergency department may be appropriate
- It is preferred to transport the MCS patient to the center where the device was implanted
- Transport the following with the patient: backup controller, extra batteries, MCS/LVAD coordinator number



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