

Top Ten Things to Know CPR and Mechanical Circulatory Support

1. Mechanical circulatory support (MCS) has evolved from a rarely used therapy reserved for the most critically ill hospitalized patients to an accepted long-term outpatient therapy for treating patients with advanced heart failure.
2. Unfortunately, different and sometimes conflicting instructions are given by hospital providers and emergency medical services (EMS) directors to EMS and other healthcare personnel on core resuscitative practices such as the role of external chest compressions in patients who suddenly become or are found unresponsive.
3. The purpose of this scientific statement is to describe the common types of MCS devices that emergency healthcare providers may encounter and to present expert, consensus-based recommendations for the evaluation and resuscitation of adult and pediatric patients with MCS with suspected cardiovascular collapse or cardiac arrest.
4. The recommendations focus initially on emergency first-response providers, whether outside or inside the hospital, with additional sections on advanced care that may be provided in the emergency department or in-hospital settings.
5. Nearly all patients who receive MCS have end-stage systolic heart failure. Although there are only a limited number of approved devices, they differ in the indications for their placement, their configuration, and the means by which they pump blood.
6. The likelihood of a favorable outcome after cardiac arrest increases substantially if the event is witnessed, the event occurs in a public place, bystanders call 9-1-1 and initiate chest compressions promptly, the initial rhythm is VF, an automated external defibrillator is applied and used, and there is a prompt EMS response.
7. By providing comprehensive assessment of cardiac anatomy and function, along with evaluation of LVAD function, echocardiography can provide critical information for physicians caring for patients with an LVAD who are acutely ill. The following questions should be considered during the assessment: Are the clinical symptoms attributable to an acute deterioration of native cardiac function? Is the LVAD itself malfunctioning?
8. The use of durable MCS devices as a bridge to transplantation in the pediatric population is increasing. There is little published information on the management of cardiac arrest in children supported with a VAD. Resuscitative care for children supported with an adult implantable VAD should be based on algorithms outlined for adults in this document. In younger children, principles for the management of resuscitation are similar to those for the management of adults.
9. This document represents consensus opinion among MCS specialists and resuscitation and EMS experts concerning responding to the unique needs of MCS-supported patients with cardiac arrest/circulatory collapse. Every effort was made to include key organizations and providers for patients with MCS. Because this is an evolving field, devices vary from center to center and population to population. For that reason, an attempt was made to discuss cardiac arrest in broad terms without focusing on the nuances of each individual device.
10. This statement highlights the recognition and treatment of cardiovascular collapse or cardiopulmonary arrest in an adult or pediatric patient who has a ventricular assist device or total artificial heart. Specific, expert consensus recommendations are provided for the role of external chest compressions in such patients. Each clinical scenario requires an individualized treatment plan. We hope that this consensus document provides guidance and standardization in an area where there is a recognized lack of published evidence yet a clinical need for direction. MCS centers are encouraged to publish their experiences and to educate others about potential best practices.

Peberdy MA, Gluck JA, Ornato JP, Bermudez CA, Griffin RE, Kasirajan V, et al; on behalf of the American Heart Association Emergency Cardiovascular Care Committee; Council on Cardiopulmonary, Critical Care, Perioperative, and Resuscitation; Council on Cardiovascular Diseases in the Young; Council on Cardiovascular Surgery and Anesthesia; Council on Cardiovascular and Stroke Nursing; and Council on Clinical Cardiology. [Cardiopulmonary resuscitation in adults and children with mechanical circulatory support: a scientific statement from the American Heart Association](#) [published online ahead of print May 22, 2017]. *Circulation*. doi: 10.1161/CIR.0000000000000504.