

Postcardiac Arrest Management



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Post Cardiac Arrest Service

KEYWORDS

• Heart arrest • Resuscitation • Prognostication • Hypothermia • Critical care

KEY POINTS

- Following resuscitation from cardiac arrest, patients exhibit a sepsislike syndrome that affects multiple organ systems.
- Resuscitation and critical care interventions should be adapted to the unique neurologic injury patterns found in the postarrest population.
- Temperature management is a critical component of the critical care provided to this population.
- Neurologic recovery may require greater than 72 hours.

OVERVIEW AND GOALS OF CARE

Management of the postcardiac arrest patient is complex and addresses multiple key issues simultaneously: diagnosing and treating the cause, minimizing brain injury, managing cardiovascular dysfunction, and managing sequelae of global ischemia and reperfusion injury. During the initial minutes to hours after return of spontaneous circulation (ROSC), the most immediate threat to life is cardiovascular collapse. The astute practitioner will simultaneously address end-organ perfusion, oxygenation, ventilation, electrolyte abnormalities, and body temperature as well as concurrently search for the cause of cardiac arrest and initiate relevant treatments.¹

DETERMINING THE CAUSE AND EXTENT OF INJURY AFTER CARDIAC ARREST

History and Physical Examination

Most patients are comatose after cardiac arrest resuscitation and are unable to provide a history of illness or medical conditions. Emergency Department (ED) providers

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must turn to other sources of information, including family members, witnesses, Emergency Medical Services (EMS) personnel, and the medical record. In addition to routine medical history, medications, and drug allergies, there are several key pieces of information specific to the cardiac arrest and resuscitation to extract from these sources that are presented in **Box 1**.

Baseline Neurologic Examination

A baseline neurologic examination should be performed on all resuscitated patients. This examination helps to elucidate possible causes of cardiac arrest, estimate the patient's clinical course, and determine the target for temperature management. This examination should unequivocally be performed in the absence of confounding neuromuscular blockade and sedation. The baseline neurologic examination may be delayed if long-acting neuromuscular blockers or sedatives have already been administered. Sedation should be paused and train-of-4 testing should be considered to verify a valid neurologic examination. Optimizing hemodynamics and acid-base status is prudent before this examination.

Most postcardiac arrest patients are comatose and intubated. The Full Outline of Unresponsiveness (FOUR) score was developed by Wijdicks and colleagues² specifically to assess patients with impaired level of consciousness that may be intubated. It has been validated in both the ED³ and the intensive care unit (ICU)⁴ settings and has comparable interrater reliability to the Glasgow Coma Scale.⁵ The FOUR score provides an excellent tool to quantify and systematically describe the level of consciousness and preserved brainstem reflexes in postcardiac arrest patients (**Table 1**).

Asymmetric or focal neurologic findings are unexpected in postcardiac arrest patients and suggest a focal intracranial lesion. At a minimum, ED providers should note the brainstem and motor components to the FOUR score, which include pupillary reactivity and symmetry, corneal reflexes, gag/cough reflex, flexor/extensor posturing, response to pain, and ability to follow commands. Providers should also pay particular attention to the motor component, because patients not following commands should be strongly considered for induced hypothermia.

Diagnostic Testing

The minimum initial diagnostic testing for the resuscitated cardiac arrest patient includes an electrocardiogram (EKG), laboratory tests, and imaging studies. The combination of results helps point toward the cause of cardiac arrest and assesses the degree of organ dysfunction and illness severity.

Electrocardiogram

Acute myocardial infarction, arrhythmia, and cardiomyopathy are common and correctable causes for cardiac arrest. A 12-lead EKG is mandatory to obtain after

Box 1

Salient pieces of information to obtain for the postcardiac arrest patient

Were there any prodromal symptoms (ie, chest pain, shortness of breath)?

Was the cardiac arrest witnessed?

Was bystander CPR provided?

What was the initial cardiac rhythm?

How long was CPR provided?

How many doses of advanced cardiovascular life support medications were administered?

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