

Cardiogenic Shock



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KEYWORDS

- Cardiogenic shock • Intra-aortic balloon pump
- Percutaneous ventricular assist device • Inotropes • Revascularization

KEY POINTS

- Cardiogenic shock is the leading cause of death for patients hospitalized with an acute myocardial infarction.
- Early revascularization is the therapy of choice for patients with cardiogenic shock complicating an acute myocardial infarction.
- Intra-aortic balloon pumps have not been shown to improve survival for patients who are suffering from an acute myocardial infarction in the modern era of early revascularization.
- Percutaneous ventricular assist devices are a promising therapy for temporary support of patients in cardiogenic shock, but rigorous clinical data demonstrating improved outcomes are lacking.
- Routine utilization of a pulmonary artery catheter in managing patients with cardiogenic shock is unnecessary, but may be vital to determining a care plan in select patients being considered for mechanical support or transplant.

Shock is characterized by a state of end-organ hypoperfusion resulting in abnormal organ homeostasis, leading to high patient morbidity and mortality. Cardiogenic shock (CS) is a clinical syndrome characterized by systemic hypotension and hypoperfusion secondary to insufficient cardiac output. In states of pure CS, cardiac filling pressures are elevated and cardiac output is low.¹ CS can lead to multisystem organ failure, manifested by oliguria, lactic acidosis, altered mentation, and cool extremities. Most commonly, CS is the direct sequelae of an acute myocardial infarction (MI), and acute ischemic CS carries an in-hospital mortality of greater than 50%.^{2,3} However, CS can also arise as an acute presentation of a cardiomyopathy of nonischemic cause or as a severe decompensation of chronic (ischemic or nonischemic) cardiomyopathy. The latter presentations are less common and account for only 1% of acute heart failure syndromes.⁴

Disclosures: None relevant.

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Critical care management is centered on an efficient, rapid, and organized approach to the shock patient using a multidisciplinary care approach between intensivists, heart failure specialists, cardiac surgery, and interventional cardiology. The tenets of therapy include restoring cardiac output and identifying and treating one or multiple potential causative factors: hypoxia, hypervolemia, acidosis, arrhythmias, coronary ischemia, and mechanical complications of an MI. In certain clinical situations (eg, requirement for multiple inotropes or vasopressors, worsening hemodynamics despite inotrope support), it may be prudent to refer the patient to the nearest left ventricular assist device (LVAD)/transplant program for further management.

PHYSICAL FINDINGS

The importance of a focused physical examination in the management of a patient with CS should be emphasized. It is at this critical juncture in the clinical evaluation process that obtaining the correct information can direct the caregiver down the right diagnostic and therapeutic pathway. A thorough assessment allows for evaluation of intravascular volume status and adequacy of end-organ function (**Box 1**).

Jugular Venous Pressure and S₃ Gallop

The internal jugular vein forms a direct fluid column with the right atrium and provides a noninvasive measure of right atrial pressure. The correct method for determining jugular venous pressure (JVP) is depicted in **Fig. 1**. The patient should be placed in bed at a 45° angle, which can be confirmed by use of the ball found commonly on the side of a

Box 1

Components of the heart failure physical examination

JVP
 Rales
 Displaced and sustained point of maximal impulse
 Gallops—third or fourth heart sounds
 Heart murmurs
 Cool extremities
 Peripheral, scrotal, or presacral edema
 Right ventricular heave/parasternal lift
 Hypotension
 Tachycardia
 Tachypnea
 Abdominal ascites
 Hepatomegaly
 Pulsatile liver
 Pulsus alternans
 Orthopnea
 Dullness to percussion in lung bases
 Restlessness
 Temporal wasting

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