

Postoperative Hypotension

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Evaluation

The initial evaluation of a patient with postoperative hypotension involves the *immediate exclusion of life-threatening treatable causes and initiation of early resuscitation* (Fig. 89.1). One must verify the accuracy of the blood pressure reading before early and aggressive measures are instituted. A cuff larger than two-thirds the circumference of the arm or an improperly calibrated arterial line may give falsely low blood pressure readings. Once the determination has been made that the reading is accurate, supplemental oxygen and fluid resuscitation with crystalloid need to be urgently initiated. Airway, breathing, and circulation (ABC) should be promptly assessed in the unstable patient. One should place the patient in Trendelenburg position. A rapid, accurate patient history needs to be obtained with particular attention paid to home and current medications, allergies, perioperative and intraoperative events (e.g., blood loss), the circumstances surrounding the current hypotensive episode (rapidity of onset, associated symptoms, etc.), and any use of intraoperative stress dose steroids. Physical exam should include vital signs (blood pressure, pulse, respiratory rate, temperature), oxygen saturation, and hourly urine output. The patient's mental status is determined and compared to known baseline. Secondary survey should include a thorough heart, lung, and pulse exam. The surgical wounds and drains need to be evaluated.

Workup

Proper laboratory assessment is critical and should include an arterial blood gas, complete blood count, basic metabolic profile, coagulation profile, and a type and screen. An electrocardiogram, troponin level, and chest X-ray need to be obtained. Invasive monitoring needs to be considered in an unstable patient and in a patient who does not respond appropriately to resuscitation. A Foley catheter needs to be

placed. Additional invasive monitoring techniques available include arterial line blood pressure monitoring, a central venous catheter, and a Swan-Ganz catheter to provide objective data regarding heart function.

Differential Diagnosis

Life-Threatening Hypotension

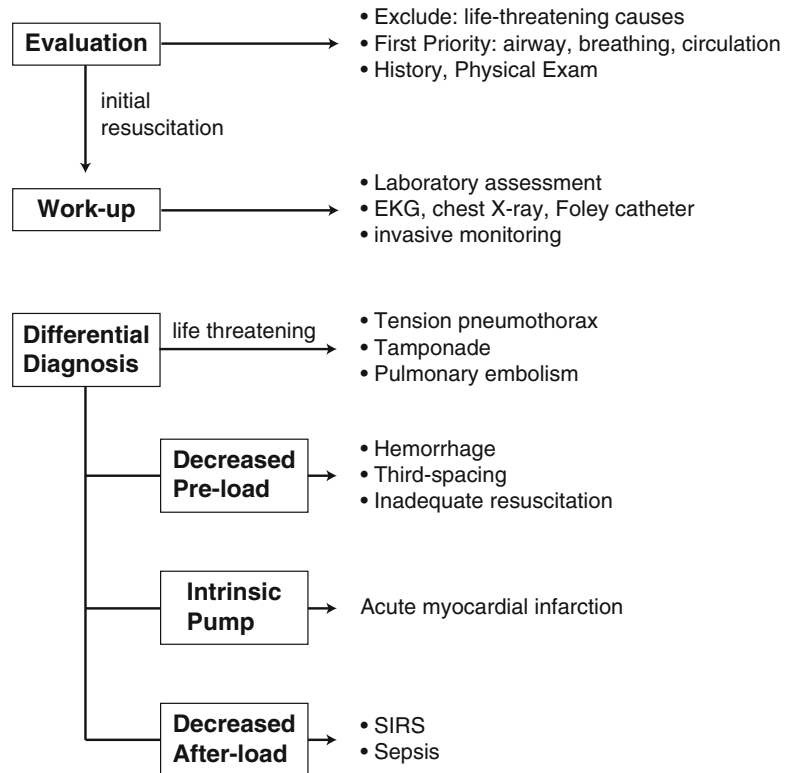
Life-threatening treatable causes of hypotension need to be excluded immediately. A **tension pneumothorax** restricts venous blood flow to the heart and causes acute hypotension. Immediate needle decompression with a large-gauge needle in the second intercostal space midclavicular line is indicated without delay. After needle decompression, a chest tube is required for definitive treatment. **Cardiac tamponade** results in equalization of diastolic pressures of the heart and acute hypotension. Only low volumes of blood are needed to cause life-threatening hypotension in acute tamponade. An immediate bedside pericardiocentesis is indicated, followed by a formal pericardial window in the operating room for definitive treatment. A **pulmonary embolism** needs to be excluded.

Decreased Preload

Decreased systemic blood pressure can be the result of decreased preload. Hemorrhage, *the most common reason for postoperative hypotension*, must be recognized promptly and acted on in an expedited manner. External hemorrhage can be controlled with bedside pressure or ligation of the bleeding source. Internal bleeding causing hypotension usually requires reoperation to control; however, it is reasonable to first check the patient's coagulation profile. A patient with an abnormal coagulation profile needs to be treated with blood products to correct the coagulopathy,

FIG. 89.1 Treatment algorithm for postoperative hypotension. *EKG* electrocardiogram, *SIRS* systemic inflammatory response syndrome

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reserving a return to the operating room for a failure of the blood products to control bleeding. Even in the presence of an abnormal profile, the threshold for returning to the operating room should be low. Two additional common causes for decreased preload include third spacing of fluids and inadequate intraoperative fluid replacement. Fluid resuscitation is the mainstay of therapy for these causes of postoperative hypotension. Additional diagnoses include sepsis, burns, high epidurals, and drug-related and high-PEEP mechanical ventilation.

Intrinsic Pump Malfunction

Decreased systemic blood pressure can be the result of intrinsic pump failure, a common cause of which is an acute myocardial infarction. Patients with postoperative hypotension should be evaluated with an electrocardiogram and troponin levels. Additional causes of intrinsic pump malfunction include dysrhythmias, cardiomyopathies, valvular disorders, cardiac depressant drugs, and decompensated congestive heart failure. A patient with intrinsic pump failure needs invasive monitoring and treatment needs to be in response to the objective data invasive monitoring provides.

Decreased Afterload

Decreased blood pressure can be the result of decreased afterload. A common cause of decreased afterload is the vasodilatory effects of the systemic inflammatory response syndrome (SIRS) to surgery and sepsis, if infection is present (see Chap. 91). Sepsis requires prompt treatment with broad-spectrum antibiotics and aggressive fluid resuscitation guided by invasive monitoring. Strict algorithmic guidelines for the treatment of sepsis can be found via the Surviving Sepsis Campaign.¹ Sources of immediate sepsis are necrotizing infections of the fascia and soft tissue, mandating evaluation of all surgical wounds in a postoperative patient with hypotension. Anaphylaxis is a less common cause for postoperative hypotension but must be recognized because emergent treatment with epinephrine is essential. Additional causes of decreased afterload-induced postoperative hypotension are neurogenic shock, high epidurals, burns, and drug-related and transfusion-related reactions.

¹<http://www.survivingsepsis.org>