

# POSTOPERATIVE HYPOTENSION

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Postoperative hypotension is defined as BP that is less than 25% of its chronic preoperative level. Its incidence is thought to be common.<sup>1-2</sup> The degree of hypotension that increases the risk of complications varies with the chronic preoperative BP and the presence of preexisting end organ disease. Complications include ischemia and/or infarction of the myocardium, cerebrum, kidneys, bowel, and spinal cord.<sup>3</sup> Conceptually (and classically), the causes of postoperative hypotension can be classified into one of three broad categories: decreased preload, decreased contractility, and decreased afterload. A *decreased preload* may be due to hypovolemia, vasodilation, surgical maneuvers that restrict venous return, elevated intrathoracic pressures, patient positioning, pericardial tamponade, and pulmonary embolus. *Decreased contractility* may be due to the effects of inotropic depressant drugs, arrhythmias, cardiomyopathies, CHF, myocardial ischemia, myocardial infarction, hypoxemia, valvular heart disease, or an abrupt increase in afterload. *Decreased afterload* may be due to such factors as vasodilation, sepsis, anaphylaxis, or endocrine abnormalities (Addisonian crisis, hypothyroidism, hypoglycemia). Clinically, the search for the etiology of postoperative hypotension should be directed toward finding and treating life-threatening causes.

- A. Evaluate the adequacy of ventilation. Postoperative hypotension may be a reflection of hypoxemia and/or hypercarbia, either of which may be life-threatening, and as such, should be assessed first (e.g., ABC to evaluate for hypercapnia).
- B. Evaluate the urgency of the situation. Those situations that present evidence of end organ damage must be evaluated and treated emergently to prevent further sequelae. Physical examination of the patient should direct the need for further laboratory studies. Postoperative hypotension may be a reflection of ominous conditions. Search for evidence of myocardial ischemia or infarction with patient history, ECG, and central monitoring (PA catheter). Symptoms of histamine release (bronchospasm, urticaria, edema) in the setting of hypotension may indicate the presence of an anaphylactic/anaphylactoid reaction. Examine the chest for the presence of tracheal deviation or decreased breath sounds to rule out pneumothorax or

tension pneumothorax. Distant heart sounds may indicate the presence of pericardial tamponade. This diagnosis can be confirmed by equalization of RA, RV, and PA pressures and decreased ECG voltage. Echocardiography is diagnostic.

- C. Those situations that present no evidence for end organ damage can be treated after a more thorough evaluation. Review the past medical history for the presence of autonomic dysfunction, medications that may contribute to hypotension, and baseline disease states.<sup>4</sup> Review the intraoperative anesthetic record to reveal potential causes for hypotension.<sup>5</sup> In healthy patients without significant associated disease, the most common cause of postoperative hypotension is hypovolemia, usually resulting from inadequate fluid and/or blood replacement.
- D. If questions exist regarding volume status, consider placing invasive central monitors. If the CVP is decreased, the healthy, hypovolemic patient should respond to a fluid challenge. When there is a poor response to fluid challenge or an increased CVP in the setting of hypotension, or when the patient has known cardiac risk factors, consider placement of a PA catheter. The indices derived and measured with the PA catheter may be used to direct inotropic, vasodilator, and/or vasopressor therapy.

## References

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