

Perioperative Medicine: Review Questions

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QUESTIONS

Choose the single best answer for each question.

- 1. A 65-year-old man with type 2 diabetes mellitus and hypertension presents for preoperative evaluation prior to an elective hip arthroplasty. He has no signs of heart failure or cardiac ischemia. Which of the following agents should be administered preoperatively to decrease the risk of perioperative cardiac morbidity in this patient?**
 - (A) Atenolol
 - (B) Hydralazine
 - (C) Minoxidil
 - (D) Prazosin
 - (E) Verapamil
- 2. Which of the following tests should be routinely obtained in a healthy 40-year-old man before elective laparoscopic cholecystectomy?**
 - (A) Bleeding time
 - (B) Chest radiograph
 - (C) Echocardiogram
 - (D) Serum potassium level
 - (E) None of the above
- 3. A 77-year-old woman with an intertrochanteric hip fracture experiences postoperative delirium. Which of the following is the least likely common cause of postoperative delirium in this patient?**
 - (A) Antiemetic therapy
 - (B) Calf vein thrombosis
 - (C) Hyponatremia
 - (D) Narcotic analgesia
 - (E) Urinary tract infection
- 4. Which of the following regimens is most effective in preventing venous thromboembolism in patients undergoing open reduction and internal fixation for a trochanteric hip fracture?**
 - (A) Aspirin 325 mg daily
 - (B) Enoxaparin 5 mg daily
 - (C) Enoxaparin 40 mg daily
 - (D) Heparin 5000 U twice daily
 - (E) Leg elevation
- 5. Which of the following is NOT a cause of postoperative hyponatremia in a patient who underwent surgery for a subarachnoid hemorrhage?**
 - (A) Cerebral salt wasting
 - (B) Diabetes insipidus
 - (C) Diuretic use
 - (D) Syndrome of inappropriate antidiuretic hormone secretion (SIADH)
 - (E) Volume depletion

(turn page for answers)

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ANSWERS AND EXPLANATIONS

1. **(A) Atenolol.** Cardioselective β_1 antagonists (eg, atenolol, metoprolol, bisoprolol) have had a significant impact on the practice of perioperative medicine. These agents recently have been demonstrated to decrease risk of perioperative cardiac complications, such as infarction, arrhythmia, heart failure, and death.^{1,2} Patients with established coronary artery disease or more than 2 risk factors (eg, diabetes mellitus, hyperlipidemia, hypertension, smoking, age > 65 years) should receive 1 of these agents before surgery for as long as possible, provided there are no contraindications such as asthma, significant bradycardia, high-grade heart block, or overt heart failure.¹ While the other agents listed may be useful for perioperative blood pressure control, they should not supplant use of β -blockers in at-risk patients.
2. **(E) None of the above.** The indiscriminate use of preoperative laboratory and ancillary testing has been the subject of debate. However, in otherwise healthy patients awaiting elective, uncomplicated procedures, routine use of a battery of blood tests and chest radiography in the absence of a clear indication rarely affects outcome or perioperative management.³ With regard to preoperative echocardiography, the indications are the same as in the nonoperative period and would not be useful in the absence of signs or symptoms of cardiac disease. Test of hemostasis only are indicated if there is a personal or family history of perioperative or spontaneous bleeding.³
3. **(B) Calf vein thrombosis.** Delirium is common in elderly patients undergoing hip fracture surgery, and levels of alertness wax and wane, ranging from somnolence to agitated paranoia.⁴ Delirium incidence increases with advanced age and is more likely to occur in patients with underlying dementia or neurologic disease. Common causes of postoperative delirium include anesthesia, antiemetics, narcotics, electrolyte derangements (especially hyponatremia), infections, hypoxia, and acid-base disturbances. Isolated calf vein thrombosis would not be expected to cause delirium; however, an above-knee thrombosis with significant pulmonary embolism and hypoxia can present as acute delirium after hip surgery.
4. **(C) Enoxaparin 40 mg daily.** Deep venous thrombosis (DVT) is a potentially fatal complication of hip fracture surgery and results from immobility, endothelial damage from the injury and surgical trauma, and a postsurgical hypercoagulable state. In fact, hip surgery is one of the most likely operations to result in postoperative DVT. As such, prevention of postoperative DVT is of interest not only to orthopaedic surgeons

but also to medical physicians who frequently manage these patients. Many prophylactic regimens have been studied and include aspirin, subcutaneous heparin, warfarin, and low-molecular-weight (LMW) heparins (ie, enoxaparin). While warfarin has been used effectively for many years, drugs such as enoxaparin have emerged as the prophylaxis of choice for patients with hip fracture.⁵ Enoxaparin dosages of 40 mg daily or 30 mg twice daily frequently are utilized, but 5 mg is not an adequate dose. Leg elevation and subcutaneous heparin are not effective. Aspirin is inferior to LMW heparins but may offer some protection in patients with contraindications to these agents.

5. **(B) Diabetes insipidus.** Disorders of sodium homeostasis, especially hyponatremia, are not uncommon following cerebral hemorrhage, stroke, head trauma, or craniotomy. Common causes of hyponatremia in this setting include volume depletion from vomiting or poor oral intake and diuretic administration (loop diuretics or mannitol). Hyponatremia also may occur from release of antidiuretic hormone (SIADH) following any type of injury or stress to the central nervous system. Classic features of SIADH include euvolesmia, hyponatremia, increased urine sodium and osmolality, and hypouricemia. Another less appreciated cause of hyponatremia in neurosurgical patients is the cerebral salt wasting syndrome. This syndrome likely results from release of atrial natriuretic peptide, leading to massive natriuresis and subsequent volume depletion, tachycardia, and increased urine sodium levels.⁶ Diabetes insipidus may complicate brain injury but usually manifests as polyuria and hypernatremia.

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