

## Geriatric Trauma: Review Questions

*David B. Levy, DO, FAAEM, FACEP*

### QUESTIONS

Choose the single best answer for each question.

- Which of the following statements concerning the epidemiology of geriatric trauma is most accurate?**
  - Advances in burn therapy have limited the disparity between mortality in younger adults and that in geriatric burn patients
  - Blood pressure usually proves a reliable parameter during monitoring for shock
  - Diminished physiologic reserve capacities of the heart and lungs contribute considerably to the unexpectedly high morbidity and mortality rates associated with geriatric trauma
  - The initial Injury Severity Score generally correlates well with predictions of morbidity and mortality in geriatric trauma
  - Only 10% of previously healthy elderly patients with major trauma will eventually return to independent living
- An 80-year-old man sustains multiple contusions and abrasions following a fall in his apartment building. He appears somewhat confused. Which of the following steps is most appropriate during the initial assessment and stabilization of this patient?**
  - Administer supplemental oxygen to him only if he is in obvious respiratory distress to avoid suppression of the hypoxic drive
  - Consider early invasive monitoring of arterial blood pressure, central venous pressure, and pulmonary oxygen saturation
  - Employ less aggressive resuscitation measures than would be used for younger patients
  - Interpret normal blood pressure and heart rate values as indicating satisfactory tissue perfusion
  - Remove dentures to facilitate bag-mask ventilation
- A 78-year-old female, lap-belted driver sustains blunt chest trauma following a single-car collision. Her medical history includes well-controlled hypertension and mild chronic obstructive pulmonary disease. Vital signs include a blood pressure of 156/84 mm Hg, pulse of 88 bpm, respiratory rate of 26 breaths/min, temperature of 98.7°F, and pulse oximetry reading of 88%. On examination, respirations seem splinted. Palpation reveals tenderness, but no crepitus, along the posterolateral aspect of the midright chest wall. A chest radiograph shows 3 nondisplaced rib fractures, but there are no signs of pneumothorax or hemothorax. Which of the following management plans is best for this patient?**
  - Apply a rib belt for comfort, and if the patient gains sufficient pain relief, discharge with a  $\beta$ -agonist inhaler and arrange follow-up within 48 hours
  - Order a computed tomographic scan of the chest, and if signs of aortic injury or pneumothorax are absent, discharge the patient and arrange follow-up within 48 hours
  - Order an arterial blood gas evaluation, and admit for observation, incentive spirometry, and aggressive pulmonary toilet
  - Perform an intercostal nerve block, observe the patient for 6 hours, repeat the chest radiograph, and discharge if there are no new radiographic changes
  - Prescribe pain medication, and arrange a follow-up visit within 48 hours

*(turn page for answers)*

---

*Dr. Levy is Residency Program Director, Division of Emergency Medicine, Temple University Hospital; and Associate Professor of Medicine, Temple University School of Medicine, Philadelphia, PA.*

#### **EXPLANATION OF ANSWERS**

1. **(C) Diminished physiologic reserve capacities of the heart and lungs contribute considerably to the unexpectedly high morbidity and mortality rates associated with geriatric trauma.** Injured elderly patients lack the physiologic reserve capacities that youth provides and are less tolerant of delays in diagnosis or treatment. Employed as a scale to calculate anticipated outcome from trauma, the Injury Severity Score proves erratic when applied to older patients. Likewise, usual parameters like blood pressure measurements are also unreliable, as many older patients suffer from baseline hypertension. Regardless of advances in burn care management, the death rate for older burn patients still remains disproportionately high, with mortality rates in geriatric patients twice those observed in younger patients with similar total body surface area involvement. Although aging beyond 65 years increases susceptibility to death and disability, the prognosis for geriatric trauma patients is not as dismal as once projected, and over half of elderly trauma patients will resume independent living.
2. **(B) Consider early invasive monitoring of arterial blood pressure, central venous pressure, and pulmonary oxygen saturation.** Geriatric patients tend to be more sensitive to and dependent on preload volume than are their younger counterparts, leaving fewer margins for error. Significant hemodynamic compromise can exist in a geriatric trauma patient despite apparent stability of noninvasive parameters (eg, heart rate, blood pressure, urine output). Early invasive monitoring not only assists evaluation but can markedly improve outcome in managing geriatric trauma patients. As physiologic reserves diminish with age, older patients become less tolerant of hypoxemia. Increasing the fraction of inspired oxygen may raise  $Paco_2$  in elderly patients with chronic obstructive pulmonary disease, not because the extra oxygen decreases the hypoxic drive but because the supplemental oxygen alters the ventilation-perfusion ratio within the lungs. Age often mistakenly biases caregivers against rendering aggressive care for elderly trauma patients. Escalating occurrence of hyper-

tension and stiffening of blood vessels (eg, pseudohypertension) account for deceptively high readings in older patients. Even with satisfactory blood pressure and heart rate values, many geriatric trauma patients may still endure occult shock. Well-fitting dentures facilitate bag-valve-mask ventilation and should be left in place to improve the mask seal. Remove the dentures immediately only if they are loose-fitting or when intubation is imminent.

3. **(C) Order an arterial blood gas evaluation, and admit for observation, incentive spirometry, and aggressive pulmonary toilet.** Blunt traumatic insult to the thorax risks damage to both the chest wall and the contained vital structures (eg, lungs, great vessels, diaphragm, heart, trachea, bronchus, and esophagus). Aging initiates many changes in respiratory function, including diminished compliance and elasticity of the chest wall, loss of pulmonary reserve, and a reduced ability to handle pulmonary secretions. Geriatric patients sustaining rib fractures suffer twice the mortality and morbidity of younger patients with similar injuries. It is critical to carefully monitor older patients sustaining rib fractures with continuous pulse oximetry and early arterial blood gas evaluation. As a general rule, it is usually prudent to admit the geriatric trauma patient with 2 or more rib fractures to improve compliance with early ambulation, incentive spirometry, and aggressive pulmonary toilet. Inspiration typically aggravates rib fracture pain, prompting splinting and hypoventilation. In geriatric patients, the pain secondary to rib fractures is likely to prevent proper ventilation and clearing of secretions by coughing, leading to atelectasis, retained secretions, and possibly pneumonia; therefore, providing adequate pain relief alone is crucial, but not sufficient, treatment. Recommended strategies include oral pain medication, local rib blocks, and epidural analgesia. Fractures tend to occur at the point of maximal impact posterolaterally, a difficult area to visualize on plain radiographic films. Binders, belts, and other restrictive devices should not be used. While decreasing the amount of pain, these devices promote hypoventilation, increasing the risk for atelectasis and pneumonia.

Copyright 2001 by Turner White Communications Inc., Wayne, PA. All rights reserved.