Chapter 255: Trauma in the Elderly

Ross J. Fleischman; O. John Ma

INTRODUCTION AND EPIDEMIOLOGY

The elderly have worse outcomes following trauma because of physiologic changes that occur with aging. They are more susceptible to serious injury from low-energy mechanisms, less able to compensate from the stress of injury, and more likely to suffer complications during treatment and recovery. Emergency physicians should have a higher suspicion for injury and lower threshold for diagnostic testing and admission than in younger patients.

Studies have variously defined the lower limits of the geriatric age group to be as young as 55 years and as old as 80 years. Some have shown mortality to increase with individuals as young as 45 years of age. Regardless of the definition, caring for injured elders constitutes a large and growing portion of emergency medicine practice. The U.S. Census Bureau projects that those ≥65 years old will increase from 13% to 16% of the population by 2020 and to 20% by 2040. Geriatric patients represented 12% of the population in the Major Trauma Outcomes Study. Although the elderly are less likely to be involved in trauma, they are more likely to have fatal outcomes when injured, with a mortality rate twice that of younger patients. Those age 65 years and older consumed a disproportionate share of trauma hospitalizations (23%) and trauma costs (28%) relative to the 12% of the U.S. population they comprised in 1985.

PATHOPHYSIOLOGY

Part of the difficulty in describing the elderly population derives from the discrepancy between chronologic and physiologic age. Chronologic age is the actual number of years the individual has lived, whereas physiologic age describes the functional capacity of the patient's organ systems. Studies have shown a clear association between age and mortality. Comorbid diseases have been shown to be associated with increased mortality after minor and moderate injuries in all age groups.

The physiologic changes of aging complicate recovery from injury and make assessment of injury more difficult. With age, myocytes are lost and replaced by collagen. This results in decreased contractility and compliance for any given preload. An 80-year-old person will have approximately 50% of the cardiac output of a 20-year-old, even without significant atherosclerotic coronary artery disease. Maximal heart rate and cardiac output decrease with age. Aging myocardium has a decreased chronotropic response to
catecholamines and is dependent on preload (intravascular volume); hypovolemia can easily result in shock. Deterioration of the cardiac conduction system leads to atrial fibrillation and bundle-branch blocks. Medications, especially digoxin, β-blockers, and calcium channel blockers, impair the tachycardic response to catecholamines, both impairing the body's inability to compensate for hemorrhage and making heart rate an unreliable predictor of hypovolemia.

Chest wall compliance, respiratory muscle strength, and the capacity for oxygen exchange all decrease with age. The response to hypoxia may decline by 50% and that to hypercarbia by 40%, such that the patient may not appear to be in respiratory distress despite impending respiratory failure.\(^8\) Because of weakened respiratory muscles and degenerative changes in the chest wall, maximum inspiratory and expiratory force may be decreased by up to 50% compared with younger patients. Age-related reductions in vital capacity, functional residual capacity, and forced expiratory volume can limit older patients' ability to compensate for chest injuries.

Renal function declines with age, predisposing patients to dehydration, requiring medication dose adjustments based on calculated creatinine clearance, and making them susceptible to contrast-induced nephropathy.

**COMMON MECHANISMS OF INJURY**

**Falls**

Falls are the most common cause of fatal and nonfatal injury in people ≥65 years of age.\(^9,10\) One third of older adults fall annually, and the rate of falls increases with age. Hip fractures are the most common fracture in elders hospitalized for injury, but the overall incidence of nonhip, nonspine fractures in women >55 years old is five times greater than hip fractures.\(^11,12\) There are age-related changes in postural stability, balance, motor strength, coordination, and reaction time that make the elderly more prone to tripping and falling. Other causes of falls in the elderly are listed in [Table 255-1](#). Bathroom falls are concerning because hard bathroom surfaces can result in head and spinal injuries, and slippery surfaces can cause falls. Falls on stairs involve higher energy and potential for injury than those on flat ground. Falls in which an individual is unable to get help for a prolonged period should prompt investigation for rhabdomyolysis and dehydration with a check of the creatinine kinase and electrolytes.
TABLE 255-1

Common Causes of Falls in the Elderly

<table>
<thead>
<tr>
<th>Causes</th>
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<tbody>
<tr>
<td>Associated with syncope/loss of consciousness</td>
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<tr>
<td>Dysrhythmias</td>
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<tr>
<td>Seizures</td>
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<tr>
<td>Acute coronary syndrome</td>
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<tr>
<td>Hypoglycemia</td>
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<tr>
<td>Pulmonary embolism</td>
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<tr>
<td>Associated with near-syncope, positional change, vasodilation (e.g., hot water)</td>
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<tr>
<td>Antihypertensive medications (especially β-blockers, calcium channel blockers)</td>
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<tr>
<td>Dehydration, diuretic medications</td>
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<tr>
<td>Hemorrhage (GI bleed, abdominal aortic aneurysm)</td>
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<tr>
<td>Hot bath or shower</td>
</tr>
<tr>
<td>Sepsis</td>
</tr>
<tr>
<td>Anemia</td>
</tr>
<tr>
<td>Nonsyncopal, &quot;mechanical&quot; causes</td>
</tr>
<tr>
<td>Deconditioning</td>
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<tr>
<td>Decreased visual acuity</td>
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<tr>
<td>Unsafe home conditions (e.g., poor lighting, loose rugs)</td>
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<tr>
<td>Alcohol</td>
</tr>
<tr>
<td>Sedating medications (narcotics, benzodiazepines, antihistamines, sleep aids)</td>
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<tr>
<td>Neurologic disease (cerebrovascular attack, Parkinson's disease)</td>
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</tbody>
</table>

Motor Vehicle Crashes

Motor vehicle crashes are the second most common cause of injury in the elderly and are the leading cause of death, with a case fatality rate twice that of those under 65 years. The elderly make up 17% of U.S. traffic fatalities.

Pedestrian–Motor Vehicle Collisions

The elderly are second only to children as victims of pedestrian–motor vehicle collisions. Those ≥65 years old account for 19% of pedestrian–automobile fatalities in the United States. Pedestrian–motor vehicle collisions are one of the most lethal mechanisms of injury in this age group, with a 53% case fatality rate.

Burns
There is a direct relationship between age and burn mortality, as evidenced by the traditionally taught Baux score, in which the sum of age and body surface area burned yield the percentage likelihood of mortality. Although the Baux score still has prognostic value, advances in critical care and burn treatment have raised the point of futility of treatment to a Baux score of 160 (rather than 100) and a 50% risk of mortality to a Baux score of 110.\textsuperscript{15} In patients >65 years old, a 50% mortality is anticipated with a body surface area of burn of 28%. The presence of inhalation injury adds the equivalent of 17 years or points of body surface area burned to the predictive score.\textsuperscript{16}

\textbf{Elder Abuse}

Maintain a high suspicion for intentional injuries and injuries caused by neglect. Warning signs include poor hygiene, untreated decubitus ulcers, injuries not explained by the reported mechanism, and subacute injuries in various stages of healing.

\textbf{CLINICAL FEATURES}

\textbf{HISTORY}

Treat injured elders as both trauma and medical patients. Ask the patient, family, and prehospital care providers about the exact events leading up to the injury. Avoid skipping the review of systems, past medical history, and medications list. Investigating the cause of a fall may uncover serious underlying medical causes or prevent future trauma.

\textbf{PRIMARY SURVEY}

Avoid feeling reassured by "normal" vital signs. A tachycardic response to pain, hypovolemia, or anxiety may be absent or blunted in the elderly trauma patient. Medications such as $\beta$-blockers may mask tachycardia and hinder the evaluation of the elderly patient. One study demonstrated that eight of 15 geriatric blunt trauma patients initially considered to be hemodynamically "stable" had cardiac outputs $<3.5$ L/min, and none had an adequate response to volume loading. Of seven patients with normal cardiac outputs, five had inadequate oxygen delivery.\textsuperscript{17} Another study reported that 39% of patients with a systolic blood pressure $>90$ mm Hg and heart rate $<120$ beats/min had occult hypoperfusion, defined by lactate $>2.2$ or base deficit less than $-2$.\textsuperscript{18} The elderly also have blunted responses to hypoxia, hypercarbia, and acidosis, which can mask the signs of respiratory failure.

Blood pressures are also misleading in the elderly patient. Because of the high incidence of underlying hypertension approaching 90%, the clinician must use a higher cutoff for hypotension than in younger patients. In blunt trauma patients $\geq$65 years old, there is an association between hypotension and mortality starting with systolic blood pressures below 110 mm Hg and heart rates above 90 beats/min. Therefore, it is reasonable to use these more conservative cutoffs as markers of abnormal vital signs.\textsuperscript{19} A decrease in blood pressure of 30 mm Hg below a known baseline or a falling trend is also a marker of instability.
Remain highly concerned about the elderly patient with abnormal vital signs. One study found that geriatric trauma patients with a respiratory rate <10 breaths/min had 100% mortality. Likewise, a systolic blood pressure <90 mm Hg in the elderly blunt trauma patient is associated with a mortality between 82% and 100%.

Anatomic variations may complicate airway management. These include the presence of dentures (which may occlude the airway and make laryngoscopy more difficult), cervical arthritis (which adds danger to extending the neck), or temporomandibular joint arthritis (which may limit mouth opening).

SECONDARY SURVEY

A thorough secondary survey is essential to uncover less serious injuries. Patients with no apparent life-threatening injuries can have potentially fatal injuries if there is some degree of limited physiologic reserve. Seemingly stable geriatric trauma patients can deteriorate rapidly and without warning. Undertake a medication review early in the patient's evaluation, paying particular attention to medications that affect heart rate, blood pressure, and coagulation.

DIAGNOSIS

HEAD INJURY

Head injuries in the elderly cause almost 142,000 United States ED visits resulting in discharge, 82,000 survivable hospitalizations, and 14,000 deaths annually. Age is an independent predictor for morbidity and mortality in patients with moderate or severe head trauma. When evaluating the patient's mental status, it would be a grave error to assume that alterations in mental status are due solely to dementia or senility.

Elders are less prone to develop epidural hematomas than the general population because of the denser fibrous bond between the dura mater and the inner Table of the skull. There is, however, a higher incidence of subdural and intraparenchymal hematomas in the elderly than in younger patients. As the brain mass decreases with age, there is greater stretching and tension of the bridging veins that pass from the brain to the dural sinuses. Bridging veins are more susceptible to traumatic tears. Diagnosis of intracranial bleeding may be delayed because brain atrophy increases intracranial free space, allowing blood to accumulate without initial signs or symptoms.

One study of blunt head trauma patients taking warfarin who were experiencing no or minimal symptoms found a rate of injury on head CT that changed disposition in 7%. Therefore, immediate noncontrast head CT is recommended for patients who take warfarin and have a mechanism of injury concerning for even a minor head injury. Check the INR, because the degree of anticoagulation correlates with the risk of adverse outcomes. The risk conferred by other anticoagulant medications is less known. Some studies have shown the antiplatelet medication clopidogrel to confer an increased risk of intracranial bleeding after head
There is insufficient evidence to delineate the risk conferred by aspirin, low-molecular-weight heparins, or the newer oral anticoagulants.

**CERVICAL SPINAL INJURIES**

The incidence of cervical spine injury is about twice as great in elders as in a younger cohort of blunt trauma patients. Odontoid fractures are particularly common in geriatric patients, accounting for 20% of geriatric cervical spine fractures, as compared with 5% of nongeriatric fractures. Preexisting cervical spine pathology, such as osteoarthritis, bulging discs, and osteoporosis, may predispose elderly patients to spinal cord injuries. With hyperextension injuries, elderly patients may develop a central cord syndrome, which causes motor deficits in the upper extremities more often than the lower extremities, variable sensory loss, and bladder dysfunction. The Canadian Cervical-Spine Rule, but not the National Emergency X-Radiography Utilization Study criteria, excludes patients age ≥65 years from being considered low risk for cervical spine injury. Thus, liberal imaging of the cervical spine in geriatric trauma patients is warranted. Because of the higher pretest probability of injury, as well as the difficulties in interpreting plain radiographs in a patient with age-related degeneration, CT scan is the preferred initial modality for assessing the geriatric cervical spine. Many fractures in one section of the spine are accompanied by fractures in another section, so identification of one fracture should prompt imaging of the entire spinal column.

**THORACOLUMBAR SPINAL INJURIES**

Thoracic and lumbar spine fractures account for almost half of all osteoporotic fractures. They are most common at the thoracolumbar junction (T12-L1) and midthoracic areas (T7-T8). Anterior wedge compression fractures are the most common. Because of the low sensitivity of plain films for identifying thoracolumbar fractures in trauma patients, CT scan is the first-line imaging modality for adult patients. This is even more significant in elders, in whom osteoporosis and degenerative changes make plain radiographs more difficult to interpret. See chapter 258, Spine Trauma, for more information on specific fracture types and management.

**CHEST TRAUMA**

The elderly are more susceptible to chest injuries from blunt trauma and have a decreased ability to compensate for these injuries. In blunt trauma, rib fractures are the most common injury found. Rib fractures in the elderly often lead to morbidity, pneumonia, and death. The adjusted odds of death in the elderly with rib fractures is about five times that of a younger cohort. Rates of pneumonia and mortality in patients ≥65 years old are twice that of younger patients, with the rates increasing with each additional fractured rib. In young adults, a chest radiograph to exclude complications such as pneumothoraces may be sufficient evaluation for suspected rib fractures, as isolated fractures may be treated conservatively at home. Because of the significant mortality associated with rib fractures in elders, a CT may be necessary to assess the extent of injuries that might not be seen on plain radiographs.
ABDOMINAL TRAUMA

The abdominal examination in elderly patients is unreliable. The FAST examination is an ideal imaging study to detect free intraperitoneal fluid. Even with an initially benign physical examination, maintain a high suspicion for intra-abdominal injuries in those with associated pelvic and lower rib cage fractures. As in younger patients, many solid organ injuries can be managed nonoperatively. Rates of successful nonoperative management of splenic injuries in elderly patients range from 62% to 85%. Therefore, CT with contrast is a valuable diagnostic test for evaluating the extent of injury and ongoing hemorrhage; however, the risk of contrast-induced nephropathy increases with age, hypovolemia, diuretic and nephrotoxic medications, diabetes, and preexisting renal disease. The risk can be reduced by volume expansion with isotonic crystalloids. Oral N-acetylcysteine does not appear to prevent contrast-induced nephropathy in patients undergoing coronary angiography. Other strategies, including sodium bicarbonate, ascorbic acid, and use of iso-osmolar versus low osmolar contrast, have had mixed results in studies.

ORTHOPEDIC INJURIES

Pelvic Fractures

While pelvic fractures in the young are generally caused by high-energy mechanisms, the elderly, especially women, frequently suffer pelvic fractures from low-energy falls to the ground from standing or from a seated position. Pubic ramus fractures are the most common injuries, and lateral compression is the most common mechanism.

CT of the pelvis should be ordered in stable patients with pelvic tenderness after an injury if plain radiographs are negative. Plain radiography is especially insensitive for posterior fractures involving the sacrum and iliac wings, so tenderness of the posterior pelvis strongly suggests the need for cross-sectional imaging. Plain radiography may be omitted in stable patients who will be going promptly to CT. Even CT may be only 77% sensitive for pelvic fractures in the elderly, particularly with nondisplaced posterior fractures in osteoporotic bone. Therefore, consider MRI for patients with pelvic pain or pain on weight bearing with negative CT imaging.

Studies have been contradictory on whether age is an important predictor of the need for angiographic assessment for bleeding in pelvic fractures. One study found that 94% of patients 60 years of age and older taken to angiography required embolization, which is significantly higher than the 52% in younger patients. Therefore, these authors advocate liberal use of angiography in elderly patients with significant pelvic fractures, even in the absence of hemodynamic instability or need for transfusion. Other studies have not demonstrated an association between age and the need for angioembolization.

Hip Fractures
Hip fracture is the single most common injury diagnosis that leads to hospitalization in the elderly. Hip fractures are a significant cause of morbidity and mortality, with about 25% of elderly patients dying within a year of injury. The vast majority of hip fractures are caused by falls to the ground. The age-adjusted incidence of hip fractures in women is approximately twice that of men. Hip fractures in men occur at older ages than in women. Femoral neck (intracapsular) and intertrochanteric fractures are about equally common, with subtrochanteric fractures comprising the remaining 5% to 10%. Bleeding from closed pelvic and long-bone fractures can cause hypovolemia in elderly patients.

Obtain anteroposterior radiographs of the pelvis, as well as dedicated anteroposterior and cross-Table lateral radiographs of the affected hip. Because plain radiographs are only 90% sensitive for hip fractures, and delay in operative repair is associated with an increase in morbidity and mortality, normal plain radiographs should be followed by more definitive imaging in patients in whom suspicion of hip fracture persists. MRI has higher sensitivity than CT for detecting hip fractures, with one study finding that 17% of hip fractures that were occult on plain radiographs were seen by MRI but not CT. The sensitivity of CT is likely lower in patients with risk factors for osteoporosis (older age, female sex, chronic steroid use, alcoholism, inactivity, poor calcium intake, endocrine disorders) and a lower energy mechanism of injury, in which fractures are less likely to be displaced. If MRI is difficult to obtain, CT may yield a diagnosis, but should be followed by MRI if nondiagnostic. Nuclear medicine scintigraphy is highly sensitive for fractures but has the disadvantages of low specificity, difficulty obtaining the study from the ED, and limited ability to delineate the full nature of the fracture. Consider admitting patients with hip fractures to a multidisciplinary team of geriatricians, orthopedists, and rehabilitation specialists.

Upper Extremity Injuries

Distal radius fractures (Colles' fractures) are the most common fractures in women up to age 75, with a lifetime risk of about 15%. Such fractures are often caused by a fall onto an outstretched hand and are associated with low bone mineral density or osteoporosis. Assess median nerve function before and after reduction, as a deficit will require immediate orthopedic consultation for possible nerve decompression. Unstable or displaced fractures require closed reduction with a hematoma block for anesthesia. A systematic review of unstable distal radius fractures in the elderly reported that functional outcomes were similar with nonoperative and operative management, even though nonoperative management was associated with a less satisfactory radiographic appearance. So while elderly patients with active lifestyles and good functional statuses may benefit from surgical treatment, many can do as well with conservative treatment.

Fractures of the proximal humerus and humeral shaft are also common after falls from standing. Carefully assess for axillary nerve injury by checking sensation at the area of deltoid muscle insertion and deltoid muscle engagement with shoulder abduction. Note that the initial 18 degrees of shoulder abduction are generated by the supraspinatus muscle, so movement in this range may still be possible with an axillary nerve injury.
LABORATORY TESTING

Elderly trauma patients should receive more intensive laboratory evaluation than younger patients (Table 255-2). This may be helpful to identify comorbid diseases (e.g., creatinine for renal dysfunction) or acute causes of syncope (e.g., troponin for myocardial infarction) or to uncover occult physiologic insults (e.g., lactate, INR, and base deficit). As discussed earlier, vital signs are an unreliable marker of shock in the elderly. Base deficit and lactate levels are useful initial indicators of shock, and serial measurements can guide resuscitation progress. Elevated lactate levels correlate with systemic hypoperfusion, intensive care unit and hospital length of stay, and mortality. 61,62 A "normal" or mild base deficit of –3 to –5 correlates with 24% mortality, a moderate base deficit of –6 to –9 correlates with 60% mortality, and a severe base deficit of ≤–10 correlates with 80% mortality.63 Check creatine kinase levels to assess for rhabdomyolysis in patients who have fallen and been unable to receive assistance for a prolonged period.

TABLE 255-2
Useful Laboratory Studies to Guide Management in Geriatric Trauma Patients

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<tr>
<th>CBC</th>
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<tbody>
<tr>
<td>Electrolytes</td>
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<tr>
<td>Renal function</td>
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<tr>
<td>Serum glucose</td>
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<tr>
<td>Coagulation profile</td>
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<tr>
<td>Disseminated intravascular coagulation panel</td>
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<tr>
<td>Base deficit</td>
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<tr>
<td>Lactate</td>
</tr>
<tr>
<td>Troponin</td>
</tr>
<tr>
<td>Ethanol</td>
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<tr>
<td>Creatine kinase</td>
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</table>

TREATMENT

OUT-OF-HOSPITAL CONSIDERATIONS

EMS providers should recognize that seemingly minor trauma mechanisms, such as ground-level falls and low-speed motor vehicle crashes, may result in significant injury to older persons. For these reasons, the threshold for scene triage or transfer to a trauma center should be lower for elderly patients than for younger patients. 64
Rates of prehospital undertriage are higher in older than in younger patients, with significant associated mortality. For the reasons discussed earlier, traditional triage criteria of physiology (e.g., heart rate and blood pressure), anatomical injury, and mechanism are unreliable in elderly patients. Therefore, the 2011 U.S. Centers for Disease Control and Prevention National Expert Panel on Field Triage recommended a lower threshold for triage of injured elderly patients, giving three key recommendations: **"Risk of injury/death increases after age 55 years. Systolic blood pressure < 110 mm Hg might represent shock after age 65 years. Low impact mechanisms (e.g., ground level falls) might result in severe injury."** The American College of Surgeons recommends that EMS providers consider contacting medical control and transporting injured patients ≥55 years old to a trauma center regardless of apparent injury severity.

The elderly can rapidly develop tissue damage leading to decubitus ulcers. Consider padded backboards or vacuum splints for prolonged transports. Patients with cervical kyphosis may need firm padding placed behind the head when in spinal immobilization in order to prevent forcing the spine into an abnormal position.

**BLEEDING AND HEAD INJURY**

The volume of intracranial blood and hematoma expansion are the most important determinants of morbidity and mortality in head injury. Rapidly reverse anticoagulation in patients taking warfarin with intracranial bleeding on CT scan. Despite a lack of sufficient positive or negative evidence, it is reasonable to reverse other forms of anticoagulation (e.g., aspirin, clopidogrel, heparin) in patients with diagnosed intracranial hemorrhage. Studies have not shown a benefit to platelet transfusion in patients on aspirin.

Admit patients with bleeding on CT scan to an intensive care unit. The disposition of patients taking warfarin but with a normal initial CT scan is challenging because such patients have a reported rate of delayed intracranial hemorrhage between 1% and 8%. Admission for a repeat head CT at 24 hours will catch most, but not all, delayed hemorrhages. Discharge after an initial negative head CT may also be reasonable in patients with lower INRs, with caregivers to watch them closely at home, and who are reliable to return if they develop symptoms and who have a plan for next-day follow-up by telephone or in person.

**RIB FRACTURES AND RESPIRATORY FAILURE**

Maintain a low threshold for admitting elderly patients with rib fractures for a period of observation until good pain control and pulmonary toilet are assured. More severe thoracic injuries, such as hemopneumothorax, pulmonary contusion, flail chest, and cardiac contusion, can quickly lead to decompensation in the elderly, especially those with baseline respiratory insufficiency. Pain control after chest wall trauma is vital to encourage ventilation in order to reduce atelectasis and the risk of infection. Pain control is challenging because the elderly may have decreased tolerance for opioid analgescics, which can have profound respiratory (hypoventilation), hemodynamic (hypotension), and CNS effects.
Continuous pulse oximetry and capnometry are helpful to assess oxygenation and ventilation. Administer supplemental oxygen to maintain oxygen saturation at >95%. Serial arterial blood gas analysis may provide early insight into respiratory function and reserve. Consider prompt tracheal intubation and use of mechanical ventilation in patients with more severe injuries, respiratory rates >40 breaths/min, or when the partial pressure of arterial oxygen is <60 mm Hg or the pressure of arterial carbon dioxide is >50 mm Hg.

**SHOCK**

One study of elderly trauma patients showed a marked increase in survival from 7% to 53% with early placement (within 2.2 hours) of a pulmonary artery catheter followed by goal-directed volume resuscitation and inotrope support. This study also identified a subset of patients with occult shock despite "stable vital signs." Given the complications associated with pulmonary artery catheters, research on the assessment of shock by serum lactate and central or mixed venous oxygen saturation, and ongoing advances in less invasive hemodynamic monitoring and echocardiography, the optimal approach to recognizing and treating occult hypoperfusion is uncertain. A general strategy is to perform the initial imaging necessary to identify life-threatening injuries (e.g., chest radiograph, CT of the head, spine, chest, abdomen, and pelvis) and then transport to the intensive care unit for aggressive optimization of hemodynamics, after which nonessential imaging and interventions (e.g., extremity radiographs and suturing) can be performed.

Resuscitate the elderly trauma patient with small volumes of isotonic crystalloid (normal saline or lactated Ringer's), watching for a response, to avoid underresuscitation or volume overload. Strong consideration should be made for early and liberal use of red blood cell transfusion, which may enhance oxygen delivery, minimize tissue ischemia, and prevent volume overload. Depending on the type of injury and severity of blood loss, consider switching to blood transfusion after 1 to 2 L of crystalloid resuscitation.

**ENVIRONMENTAL AND IATROGENIC INJURY**

The decreased lean muscle mass and impaired peripheral circulation associated with aging makes the elderly patient more susceptible to pressure sores and hypothermia. Patients with prolonged extrications or transport in cool climates may be hypothermic. Expose the patient as needed for a thorough examination, but keep the patient covered as much as possible to maintain body heat. Hypothermia not explained by environmental factors may be a sign of sepsis or endocrine abnormalities. Log-roll patients onto a padded surface as soon as possible.

**DISPOSITION AND FOLLOW-UP**

**Have a low threshold for admitting geriatric trauma patients.** Admit elderly patients with polytrauma, significant chest wall injuries, abnormal vital signs, or evidence of overt or occult hypoperfusion to the intensive care unit.

Even in patients without the need for inpatient treatment or observation, consider whether the patient is immediately ready to return home. In patients whose preinjury mobility was already tenuous, pain,
decreased mobility, and medications may make a return to home dangerous. While opioid analgesics may be necessary, they may also cause delirium, decrease balance, and impair ambulation. Observation for establishment of a safe and effective pain regimen, consultation with physical therapy, and assurance of a safe home environment may be advisable to prevent a secondary injury.

OUTCOME

The ultimate goal is to return the elderly trauma patient to the preinjury state of function. Immediately after discharge, about half of survivors return home, and half go to skilled nursing or rehabilitation facilities. The general consensus is that elderly trauma patients benefit from preferential triage to trauma centers and from aggressive and thoughtful resuscitation. In light of investigations showing that elderly patients often return to preexisting health status after trauma and the value of early invasive monitoring, it appears that aggressive resuscitation efforts for geriatric trauma patients are warranted.

PRACTICE GUIDELINES


REFERENCES


[PubMed: 18073596]


[PubMed: 22811137]


[PubMed: 19276776]


[PubMed: 12192352]


[PubMed: 11597285]


[PubMed: 10891516]


[PubMed: 21111133]


[PubMed: 21524214]


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[PubMed: 22306486]

[PubMed: 22626016]

[PubMed: 12028201]

McGraw Hill