Geriatric Trauma

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KEYWORDS

• Geriatric patient • Older adult • Trauma • Fall • Head injury • Hip fracture

KEY POINTS

- Geriatric trauma is an increasingly prevalent and historically under-triaged presentation in emergency medicine.
- Geriatric trauma patients deserve special consideration due to baseline physiologic differences and unique injury patterns.
- Geriatric trauma patients should have comprehensive evaluations, including assessment of baseline function, medications, and access to care.

INTRODUCTION/EPIDEMIOLOGY

Geriatric trauma is a rapidly evolving area of interest in emergency medicine (EM). As the population ages, emergency physicians (EPs) can expect to see a surge in geriatric patients presenting with all common chief complaints, in particular trauma.[1] Geriatric patients are defined as any patients 65 years of age or older.[2] The geriatric population continues to grow, with 69 million Americans anticipated to be older than 65 by 2030. The incidence of geriatric trauma will rise with this growth.[3,4] More than 1 million geriatric patients experience trauma annually, and this number will continue to increase.[5]

As of 2011, the average age of a trauma patient discharged from the hospital in the United States is 59, up from 54 in 2000.[6] The latest data suggest geriatric patients represent 30.75% of all trauma patients.[7] Older adults who experience trauma have worse clinical outcomes compared with younger patients.[8] The traumatic case fatality rate increases significantly after age 65; trauma patients between ages 35 and 44 have an expected case fatality rate of 3.35, whereas those ages 75 to 84 have a rate of 6.66. Even if a traumatic injury does not cause immediate death or serious injury, geriatric patients who experience traumatic injuries have an increased mortality within the next 12 months.[9]

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The most common mechanism for trauma in older patients is falls.[7] Ground-level falls account for approximately 2.1 million emergency department (ED) visits per year. Geriatric patients have a mortality of 7% to 11% after falls and have increased incidence of hospital and intensive care unit (ICU) admission compared with younger patients. The case fatality rate for geriatric patients who fall ranges from 4.04 (ages 65–74) to 8.11 (ages >84). Although ground-level falls are much more prevalent than other mechanisms of trauma in geriatric patients, other mechanisms typically seen include motor vehicle accidents, pedestrians struck by a vehicle, injuries related to other forms of transport, firearm injuries, and lacerations/penetrating injuries.

This article outlines common presentations for trauma in older adults, management strategies, and special circumstances that should be considered.

AGE-RELATED CHANGES IN OLDER ADULTS

Vital Signs

The geriatric population has more comorbidities than younger populations. Special consideration should be taken when determining normal vital signs in the setting of trauma, given physiologic changes of aging as well as increase in comorbidities. Many geriatric patients are on medications for cardiac conditions, such as β-blockers, which may slow their heart rate artificially or blunt a physiologic tachycardic response to stress or hemorrhage. Additionally, many patients have chronic hypertension that may or may not be controlled with medications. It is crucial to obtain an accurate medication list for these patients as well as to determine when they last took each medication. Physicians who remain cognizant of these vital sign nuances can avoid the pitfalls of being falsely reassured by the lack of tachycardia or a normal blood pressure (for example, a systolic blood pressure of 110 mm Hg when a patient's baseline is 160 mm Hg). Further information can be found in **Table 1**.[2]

Frailty

Geriatric trauma patients present a challenge from a physiologic perspective. Generally, geriatric patients with preexisting conditions have higher morbidity and are more likely to die within 5 years of a traumatic injury.[10] EPs must consider comorbidities, medications, and baseline functional status (eg, ambulatory ability and cognitive deficits) carefully when evaluating geriatric patients.

Generally, geriatric patients are more likely to be considered frail than their younger counterparts. Frailty, defined as the age-associated decline in physiologic function across multiple organ systems, makes patients both more likely to experience trauma (in particular falls) and to have poor outcomes after a trauma.[11,12]

Neurologic Considerations

From a neurologic perspective, geriatric patients are more likely to have neurocognitive impairments, such as dementia, which could influence the accuracy of a medical history.[13] They are more likely to have had prior cerebrovascular accidents, often with residual neurologic deficits. This can make it challenging to accurately assess for new deficits from a traumatic injury. Geriatric patients are more likely to be on anticoagulants or antiplatelets and also have decreased brain volume, making intracranial bleeds more prevalent and often more difficult to manage.[14]

Cardiopulmonary Considerations

From a cardiopulmonary perspective, geriatric patients are much more likely to be on medications that alter hemodynamics. Additionally, they have a higher incidence of baseline cardiovascular disease. Blunt cardiac injury has a higher mortality in patients

Table 1
Vital sign considerations in geriatric trauma patients[2]

Vital Sign	Special Considerations in Geriatric Population	Concerning Values in Geriatric Patient	Traditional Trauma Activation Vitals
Blood pressure	• Frequent use of antihypertensive medications	• SBP <110 mm Hg • SBP 40 mm Hg less than baseline	• SBP <90 mm Hg
Heart rate	• β-blocker, calcium channel blocker usage may blunt hemodynamic response to stress - comorbidities, such as heart failure and ACS	• Heart rate >90 bpm	• Heart rate >120 bpm
Respiratory rate	• Decreased ability to compensate for pulmonary injuries; less pulmonary reserve; may fatigue/need intervention earlier	• Rate may be normal, while still experiencing hypoxia/ hypercarbia • RR <10 is particularly worrisome.	• RR <10 or >30
Oxygen saturation	• Challenge to recognize hypoxia/ hypercarbia in patients with an atypical baseline	• Baseline may be 88%–92% rather than 100%.	• Oxygen saturation <93%

Abbreviations: ACS, acute coronary syndrome; RR, respiratory rate; SBP, systolic blood pressure.

with existing cardiac conditions.[15] Physiologically, older adults have a decline in overall respiratory function, including decreased functional residual capacity, and a higher incidence of pulmonary comorbidities, such as chronic obstructive pulmonary disease, with associated decrease in lung compliance.[13] As a result, injuries that may not have significant implications in younger patients, such as rib fractures and pulmonary contusions, have a larger impact on geriatric patients. The most common posttraumatic hospital complication is pneumonia, which can have delayed resolution in patients with poor baseline pulmonary function.[16]

Musculoskeletal Considerations

Geriatric patients are more prone to musculoskeletal injuries compared with younger patients because they are more likely to be deconditioned and also have bone pathology, such as osteoporosis. They are more likely to suffer fractures and dislocations from minor trauma.[17] Orthopedic injuries that may have minimal impact on the lives of younger patients can have a profound impact on functional independence, and even mortality, of geriatric patients.[17]

COMMON INJURIES

Head Injuries

Outcomes for geriatric patients who experience head injuries unequivocally are worse than in younger patients.[18] Traumatic brain injuries (TBIs) predominantly are caused by

ground-level falls and are a leading cause of mortality in geriatric patients.[19] Studies show a mortality of up to 74% in patients older than 65.[18] Mortality for geriatric head injury patients with a Glasgow Coma Scale score less than 8 is extremely high, and in some studies a low Glasgow Coma Scale score is thought to be predictive of death.[18,20] Recovery from serious head injuries often is delayed and results in worse cognitive and psychosocial function in older adults compared with their younger counterparts.[21]

As patients age, the incidence of subdural hematoma after a head injury increases significantly. This is due partly to the inherent changes in vasculature and white matter in geriatric patients and exacerbated by the increased prevalence of antiplatelet and anticoagulant therapy in this population.[22] Geriatric patients on anticoagulation may have a delayed presentation of intracranial hemorrhage, necessitating a longer period of observation after their injury.[23] Historically, there has been controversy surrounding observation, repeat neurologic examinations, and repeat head imaging. Current data suggest head computed tomography (CT) at the time of presentation is sufficient for patients with a normal neurologic examination, patients with therapeutic/subtherapeutic international normalized ratio (INR) (if on warfarin), and for those taking novel oral anticoagulants.[24] For those patients with a supratherapeutic INR, further observation likely is necessary; however, there remains no consensus on whether serial neurologic examinations are sufficient or if repeat imaging is warranted.

If there is an acute intracranial hemorrhage, the patient should be resuscitated as needed and evaluated by a neurosurgeon, and reversal of anticoagulation (if present) should be initiated. If the head CT is unremarkable and the patient otherwise is safe for discharge, the EP frequently is tasked with the decision on whether to continue or hold anticoagulation, particularly in patients with frequent falls. There are studies suggesting that patients with frequent falls do not have an increased risk of major bleeding, thus making it safe to continue anticoagulation.[25] Other studies show that there are increased rates of intracranial hemorrhage in patients with frequent falls; however, there are no differences between patients on warfarin and those on aspirin only. Additionally, within this study those in the warfarin group showed that the drug was protective against stroke, intracranial hemorrhage, myocardial infarction (MI), and death.[26] Finally, there are data to suggest that patients on warfarin would need to fall 295 times in a year for the risk of fall-related intracranial hemorrhage would outweigh the benefit of the warfarin itself.[27]

Although these data suggest that continuing anticoagulation is safe for patients, in particular those with multiple stroke risk factors, it is prudent for EPs to evaluate each patient individually. This can be done by considering the underlying pathology being addressed with warfarin and making a calculated risk-benefit assessment using previously validated clinical decision rules when possible. The CHA_2DS_2-VASc score assesses the risk of stroke for patients with atrial fibrillation, a common reason for anticoagulation in the geriatric population.[27] The risk of stroke given by this score can be weighed against the risk of major bleeding while taking anticoagulation, which can be calculated by the HAS-BLED score.[28] If the risk of stroke exceeds the risk of major bleeding, then anticoagulation may be favored, even in light of fall risk.

Spinal Injuries

Geriatric patients are more likely to have baseline spinal pathology, such as arthritis, osteoporosis, stenosis, or disk disease, than younger patients. These comorbidities predispose patients to more severe cervical (C)-spine injuries from lesser impact trauma. Although young patients have the highest risk of C-spine injury at C4-7 (the most mobile portion of the C-spine), geriatric patients have increased spinal rigidity and are more likely to suffer from injuries to odontoid and C2.[29] Therefore, C-spine imaging often is warranted in geriatric patients with blunt trauma that may have affected

the C-spine.[2] Notably, 50% of C-spine injuries in geriatric patients are unstable, so the risk of missing this diagnosis, particularly after a low-impact trauma, is very high. Many radiologists recommend that any geriatric trauma patient who has a mechanism or findings severe enough to consider a head CT also should undergo cervical spine imaging.[29]

Evaluation of C-spine injuries in geriatric patients generally should be done with cross-sectional imaging as opposed to plain films. When using clinical decision-making tools to determine whether these patients need a C-spine CT, EPs often look to Canadian C-spine and National Emergency X-Radiography Utilization Study (NEXUS) rules (**Box 1**). Based on the Canadian C-spine rule, patients 65 and older are not considered low risk enough to forego imaging; therefore, limiting the utility of this tool in geriatric patients. On the other hand, the NEXUS criteria do not include age as a risk-stratifying factor, allowing its usage in older adults.[30] A subgroup analysis of approximately 3000 older adults included in the original NEXUS study reveals a sensitivity of 100% (CI, 97.1%–100%) in older adults for clinically significant C-spine injury.[31] Given the lack of a robust external validation of NEXUS, however, specifically in geriatric patients, some clinicians are hesitant to utilize this tool in older adults and prefer liberal imaging. For those patients who do receive a CT scan, EPs may be challenged with having to "clear the C-spine" after the negative imaging in patients with cognitive impairment. There is literature suggesting that magnetic resonance imaging (MRI) to evaluate for occult C-spine injury in blunt trauma can change management up to 6% of the time[32]; however, other data suggest that the incidence of occult C-spine injuries in this setting is as low as 0.12%, even in obtunded patients.[33] This likely is due to the high quality of modern CT scanners. Furthermore, another systematic review recommends removing the C-collar after negative high-quality CT scan alone (a guideline put forth by the Eastern Association for the Surgery of Trauma).[34] None of these studies addresses older adults in particular, which may make this information unclear, and the decision to remove a C-collar without confirmatory MRI a difficult one. Further issues surround the use of C-collars, which have been shown to cause discomfort, tissue breakdown, increased aspiration risk, and worsened delirium.[35] It is helpful to involve the family in the discussion around the removal of the C-collar after CT scan alone versus obtaining an MRI as well as to consider the patient's wishes, underlying functional status, and goals of care. Finally, if a patient must be sedated for MRI, the EP needs to consider the risks of sedative administration versus the likelihood of advanced imaging changing management.

Box 1
National Emergency X-Radiography Utilization Study criteria: cervical spine imaging recommended unless all criteria met

C-spine imaging is recommended unless all the following criteria are met:

No posterior midline C-spine tenderness

No evidence of intoxication

Normal level of alertness

No focal neurologic deficit

No painful distracting injuries

Data from Hoffman JR, Mower WR, Wolfson AB, et al. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. National emergency X-radiography utilization study group. N Engl J Med 2000;343(2):94–9.

Vertebral fractures are some of the most common osteoporotic fractures in geriatric patients. They are most common from T10 down into the lumbar spine. Recent studies suggest that most of the fractures are nonoperative and that spine immobilization can lead to worse outcomes. Therefore, early ambulation with a supportive brace often is indicated for vertebral fractures without neurologic compromise in geriatric patients.[36,37]

Thoracic Injuries

Geriatric patients who suffer from blunt trauma often sustain rib fractures. Age is one of the strongest predictors of mortality after rib fractures.[38] Rib fractures are a surrogate for major trauma, because 90% of patients with rib fractures have other traumatic injuries.[39] Geriatric patients with rib fractures have double the mortality rates of young patients with rib fractures and this number increases proportionally with each additional rib fracture.[40] Additionally, the risk of pneumonia, hypoventilation, pneumothorax, and respiratory failure increases with the number of fractured ribs in geriatric patients.[39] In older patients who suffer from rib fractures, up to 34% subsequently develop pneumonia, which significantly increases risk of mortality.[16] As a result of this, geriatric patients with multiple rib fractures usually benefit from inpatient management.

Multiple studies have demonstrated that appropriate analgesia lowers the risk of poor outcomes in geriatric patients with rib fractures, and many trauma centers have specific "rib fracture protocols" to manage pain (**Table 2**).[13] These protocols include multimodal analgesia in addition to pulmonary therapy, such as incentive spirometer. One study in 2005 found that epidural analgesia reduces mortality in patients with multiple rib fractures.[41] Although rib fractures in geriatric patients historically have been managed conservatively, there has been recent advocacy for operative management, particularly for rib plating. Studies on rib plating and fracture fixation thus far have demonstrated lower mortality, decreased posttraumatic complications, and shorter rehabilitation periods than patients managed conservatively.[42]

Abdominal Injury

Geriatric patients who suffer from abdominal trauma have a lower likelihood of operative management, but those who undergo surgery have worse outcomes than younger patients. Identifying intraabdominal injuries early can allow for maximal medical management and many clinicians have a lower threshold to image geriatric patients than younger patients. For patients who suffer from splenic injury, age predicts overall mortality rates.[43] Geriatric patients are more likely to have underlying

Table 2
Sample rib fracture protocol[13]

Intervention	Dosing
Nonopiates	Acetaminophen scheduled dosing Ibuprofen scheduled dosing Lidocaine patch 5%
Regional	Nerve blocks (serratus anterior plane) Consider catheter placement by anesthesiology for continuous administration
Opiates	Morphine or hydromorphone, as needed Consider patient-controlled analgesia for severe refractory pain
Nursing	Frequent incentive spirometer use Pulmonary toilet

liver and kidney disease, which can make obtaining certain diagnostics more challenging. Previously it was thought that patients with poor baseline renal function could sustain acute kidney injuries from intravenous contrast administration; however, there is a growing body of literature suggesting that this is untrue.[44,45] Considering the recent literature, trauma patients undergoing abdominal imaging with high suspicion for injury should receive intravenous contrast for better results, because the risk profile is lower than previously thought.

Orthopedic Injuries

As discussed previously, geriatric patients have higher incidence of osteoporosis and sarcopenia (loss of muscle mass), increasing the likelihood of bony injury after trauma. The most common orthopedic injury in this population is forearm fractures, followed by hip fractures. Sarcopenia, in general, increases the likelihood that geriatric patients need rehabilitation and possible prolonged hospitalization after injuries.[13,46]

There are several common types of fractures sustained at the hip or proximal femur, and older adults are particularly susceptible to these injuries. Fractures of the femoral neck are intracapsular injuries in which the 1-year mortality increases with associated medical comorbidities, such as chronic renal failure and congestive heart failure.[47] Intertrochanteric fractures occur between the greater and lesser trochanter and typically occur in an older age group than those with femoral neck fractures. Clinically, a patient's leg usually is shortened and externally rotated. Finally, subtrochanteric femur fractures occur in the region 5 cm distal to the lesser trochanter. Low-energy mechanisms should increase suspicion for pathologic fractures and further work-up.

Despite the frequency of hip fractures in older adults, the true emergent nature of a hip fracture in a geriatric patient often is underappreciated. The overall 1-year mortality of an older adult after a hip fracture is 21.2%, on par with the mortality of 24% in adults over age 65 with acute MI.[48,49] Surgical intervention is recommended in most geriatric hip fractures, except in patients who are nonambulatory or have multiple medical comorbidities that preclude surgery. The urgency in which the fracture should be repaired is underappreciated as well. In geriatric patients undergoing operative repair of a hip fracture, pulmonary complications were decreased if the surgery was performed within less than 24 hours.[50] Other studies suggest that repair within 12 hours has improvement in 30-day mortality compared with those repaired after 12 hours.[51] Delays to surgery are associated with increased 30-day mortality, 1-year mortality, and incidences of pulmonary embolisms, MI, and pneumonia. Delays in operative interventions were more likely seen in those that presented to academic institutions and during nights and weekends.[52]

Similar to those with hip fractures, geriatric patients with pelvic fractures also have a higher likelihood of developing complications and have higher overall mortality rates than younger patients. Older patients more frequently sustain lateral compression fractures, which can have associated vascular injury necessitating invasive procedures.[53] Missed pelvic and hip fractures may lead to increased nonunion, avascular necrosis, and morbidity.[54] It is important to maintain a high level of suspicion for pelvic and hip fractures and to obtain further imaging studies, such as CT or MRI, in patients who have significant pain or difficulty ambulating in the setting of a nondiagnostic radiograph. MRI has been shown to have greater sensitivity for fractures of the pelvis and proximal femur compared with CT; however, CT available is more widely.[55]

Polytrauma

Overall, polytrauma carries a mortality rate of 36% for geriatric patients. Polytrauma patients often have complicated hospital courses. One study found that the most

common complications were delirium, pneumonia, and electrolyte abnormalities.[56] Fatalities directly from trauma in geriatric patients most likely are related to neurologic damage from TBIs and exsanguination.[56]

MANAGEMENT

Trauma Activation and Consulting Services

There is evidence suggesting geriatric patients who experience trauma have better outcomes if they present to a trauma center that serves a higher proportion of older trauma patients. One study shows such patients were 34% less likely to die if cared for at a higher-volume trauma center.[5] Access to a trauma team plays a large role in the outcomes of trauma patients. Trauma team activation at trauma centers often is a crucial component of adequate trauma care, yet geriatric trauma patients are more likely to be under-triaged and not have all trauma resources utilized in their care.[57] Geriatric trauma patients who have comprehensive trauma evaluations by a trained trauma team on arrival ultimately have fewer complications and stay in the ED and hospital for less time.[58] Not every geriatric patient who falls can be seen at a trauma center, so this patient population likely is encountered in all practice environments. The EP can mitigate the lack of a trauma team with early recognition of traumatic injuries and aiming for early, thorough evaluation of all geriatric trauma patients. This includes timely radiographic diagnostics and involving consulting services to improve outcomes and decrease patient length of stay (LOS).[59] One level 1 trauma center opted to activate the trauma team for any trauma patient greater than age 70 and found that doing this resulted in both a decreased ED LOS and overall improvement in mortality.[60]

Because it is important to have access to an equipped trauma team for geriatric trauma evaluations, it is also important to have resources for a comprehensive assessment of geriatric patients overall. Having a geriatrician available for consulting on trauma patients has been shown to improve outcomes in these patients and decrease hospital LOS.[8] Specifically, geriatricians help reduce hospital-acquired complications, such as falls, functional decline, and delirium, while also evaluating new and existing medical conditions.[61] A formal comprehensive geriatric assessment improves outcomes for medical and surgical geriatric patients alike and is strongly recommended for trauma patients. Additionally, the early involvement of a palliative care team can strongly benefit patients with a high chance of accelerated death (such as those over age 80 suffering a hip fracture and geriatric patients with multiple rib fractures, TBI, or polytrauma), in addition to benefiting their families and the hospital system as a whole.[62,63] Early palliative care consultation, even initiated from the ED, can decrease patient pain and suffering, decrease family anxiety, improve patient/family understanding of goals of care, decrease hospital LOS, decrease ICU admissions, and decrease hospital system costs.[13,64]

Pain Management

Pain control can be difficult in geriatric patients. Physiologic changes that occur with aging can influence the effects and metabolism of pain medication. For example, having a lower overall plasma volume, decreased muscle mass, and increased body fat can give lipid-soluble medications, such as fentanyl, a longer duration of action. Medications with lower lipid-solubility, such as morphine, can have a much more potent effect than desired.[65] Additionally, many geriatric patients are on multiple home medications, and polypharmacy can present a risk when prescribing acute doses of opioid pain medications. Many well-intended physicians prioritize the risks of acute pain

management while dosing geriatric trauma patients, which can lead to the undertreatment of pain in these patients.[66,67] Undertreating pain is a frequent cause of delirium, but over-medication, particularly with opioids, also can contribute to delirium, exacerbation of dementia, or sedation.

There are several options for acute pain management in geriatric patients. Acetaminophen has relatively few side effects and contraindications.[68] Nonsteroidal anti-inflammatory drugs (NSAIDs) have a higher risk profile and can cause renal dysfunction and gastrointestinal bleeds. In the acute setting, however, topical NSAIDs have similar effectiveness to oral ones and have lower systemic effects.[69] Ketamine can be considered for acute management if trying to avoid opioid analgesia; however, the data for ketamine safety in older adults are sparse. Ketamine also is noted to cause psychogenic side effects that may be difficult to mediate; thus, it is recommended to use a low-dose ketamine infusion if necessary.[70] If using opioids, it is recommended to use a low dose (25%–50% less) for a short duration, primarily in the setting of failure of other pain management techniques.[71,72]

Regional anesthesia, including local or epidural blocks, also can provide pain relief to patients and is considered superior to opioid analgesia. Epidural analgesia has been associated with a reduction in mortality for patients with multiple rib fractures.[41] Peripheral nerve blocks act faster and last longer in geriatric patients, with fewer systemic side effects than oral or parenteral pain management options.[73] It is increasingly common to see a variety of ultrasound-guided nerve blocks performed in the ED. Overall, considering a multimodal approach to pain management can help minimize risks of use of any 1 method, while increasing pain control for patients.

DISPOSITION CONSIDERATIONS

Geriatric patients with traumatic injuries have a high likelihood of being admitted to the hospital. Ideally, they are admitted to a trauma service with a geriatrics consult, so that their specific injuries can be addressed while also receiving a holistic evaluation of their medical condition. In many academic hospitals, patients with isolated orthopedic injuries and multiple comorbidities are admitted to the internal medicine service for management. Admitting these patients to internal medicine can increase their LOS significantly, particularly for those with hip fractures.[74] Hip fracture patients have a similar number of postoperative complications, whether admitted to medicine or orthopedic services.[75] Regardless of the arrangement, it is helpful to draft interdepartmental protocols for common injuries, such as hip fractures.

When discharging older adults, there are several barriers that should be considered (**Box 2**). Whether the patient is coming from home or a nursing facility, it is important to consider elder abuse or neglect. If the patient lives alone, assessment is needed to see if they can care for themselves or if they have family support. This is important particularly in terms of medication administration, activities of daily living (ADLs), and ambulatory function. Finally, and importantly, employing rehabilitation services in the ED to ensure safe disposition is gaining acceptance.

Medications often are prescribed after ED visits; however, this is a major opportunity for improvement in the care of older adults. Careful review of a patient's medication list is prudent, and avoidance of polypharmacy has important safety implications. Many older adults have several prescribers, and as a result it becomes easier to unintentionally create unsafe medication interactions. Polypharmacy is a major cause for falls in older adults, and it has been documented that up to 37% of geriatric patients are on anticholinergic medication.[76] To ensure safety in prescribing medications to the geriatric population, a list of dangerous medications (Beers Criteria) has

Box 2
Disposition considerations in geriatric patients

Safe discharge plan
- Ability to perform/has assistance with ADLs
- Discussion with caretaker regarding plan of care, new medications, follow-up plan

Screen for elder abuse for example, Elder Abuse Suspicion Index[82]

Occupational therapy evaluation or ability to perform ADLs

Vision/ability to safely take appropriate medications

Physical therapy evaluation or ambulatory assessment

Cognitive assessment

Medication reconciliation/review of Beers Criteria

been compiled by the American Geriatrics Society (AGS).[77] Some institutions have incorporated clinical support tools, such as medication order sets, which have shown substantial reduction in inappropriate prescribing.[78] ED-based pharmacists also can be a valuable resource.

Regarding falls, the AGS has recommended that all older adults who fall get a risk assessment. This includes, but is not limited to, medication review, visual acuity, ambulatory/gait evaluation, and assessment for postural hypotension.[3] This does not necessarily need to occur on the index ED visit. A patient's caregiver or primary care physician should be notified to ensure expeditious follow-up because up to 30% of patients fall again in 1 year, and up to 12% fall multiple times.[79] Although not possible in all EDs, a physical therapy evaluation when available can reduce ED revisits significantly.[79,80] Recently, a randomized controlled trial centered around a fall prevention program showed a number needed to treat of 3 to prevent revisits, 6 to prevent recurrent falls, and 9 to prevent a hospitalization. This program was centered around EP, pharmacist, and physical therapist evaluation.[81]

SUMMARY

In summary, there are several considerations in the care of the geriatric trauma population. Recognition of physiologic and vital sign differences, prompt evaluation and diagnostic imaging, and timely consultations for definitive management decrease the mortality of the geriatric trauma patient. Finally, a comprehensive evaluation of medication safety, ambulatory function, and appropriate follow-up all are imperative and improve clinical outcomes.

CLINICS CARE POINTS

- EPs should familiarize themselves with the age-related physiologic changes common among older adults. Special consideration should be given to vital signs and medications that affect them.
- Early evaluation of the geriatric trauma patient, even with seemingly benign mechanisms, can save lives.
- Discharge after normal noncontrast head CT is sufficient for anticoagulated patients who are neurologically intact, have a therapeutic INR, or are on direct oral anticoagulants. Those with a supratherapeutic INR require at minimum further observation.
- Cessation of anticoagulation likely is unnecessary following an ED visit for head injury. Consideration should be given to the reason for the patient being anticoagulated and the risk/benefits of cessation versus bleeding from future trauma.

- C-collars should be removed after negative C-spine CT in the alert, neurologically intact patient. For patients with dementia, or other mental status changes, the data are less clear. The authors recommend discussion with the family regarding patient's wishes and risks/benefits of sedation for MRI versus diagnostic yield, if necessary.
- EPs should familiarize themselves with the list of medications to avoid in the elderly (Beers Criteria).
- Physical therapy evaluation of the geriatric patient after a fall, whether in the ED or on follow-up, is vital for the prevention of further injury.

DISCLOSURE

The authors have nothing to disclose.

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