Module 2: Trauma and Falls in the Elderly — Mrs. Harvey

Date Created: November 2006 (case adapted for high-fidelity medical simulation from cases originally developed in 2005 by the Society for Academic Emergency Medicine Geriatric Task Force)

Target Audience: Emergency Medicine Residents PGY 1-4
Medical Students

Objectives

1. Demonstrate the use of the domain management geriatric emergency care model (DMM)
2. Demonstrate the use of the Identification of Seniors at Risk (ISAR) Questionnaire
3. Define elder abuse and neglect
4. Describe various presentations and scenarios in which elder abuse and/or neglect could be a component
5. Define intervention strategies for suspected elder abuse and neglect
6. Discuss the demographics of trauma and injury in the elderly population
7. Discuss the important issues in prehospital assessment and care of these patients
8. Understand the impact of aging on initial trauma assessment, stabilization, diagnostic evaluation, treatment, and disposition
9. Understand the impact of aging on the cardiovascular response to shock
10. Discuss the impact of aging on patterns of injury and on injury location, extent, and severity
11. Discuss why transfer and hospitalization are more often a necessary disposition in the management of the injured elderly patient

Core Competency Objectives (see Critical Actions Checklist)

1. Medical knowledge
2. Patient care
3. Interpersonal and communication skills
4. Systems-based practice
5. Professionalism
6. Practice-based learning

Readings


Aschkenasy M, Rothenhaus TC. Trauma and falls in the elderly. Emerg Med Clin N Am. 2006;24:413-432.

Environment and Equipment

- Level 1 trauma center
- Female street clothes
- Cervical collar
- Backboard
- Wrist dressing and sling
- IV and normal saline set-up
- Scalp hematoma moulage
- Medication list or bottles from home
Personnel
- Patient/sim operator: 75-year-old woman
- Husband
- Nurse

Case Summary: Patient is a 75-year-old woman with a presumed fall from standing, although history is initially unclear. Both patient and husband are retired historians. Husband states he heard a noise that woke him up and he found his wife at the bottom of 2 to 3 steps to the living room. The son calls EMS and brings the husband into the ED. Initial vital signs are relatively normal. The patient is stable through initial assessment and then rapidly has a decline in vital signs secondary to a tension pneumothorax. Final diagnoses will include atrial fibrillation, alcohol intoxication, minor closed head injury, multiple rib fractures with hemopneumothorax, and a wrist fracture. Contributing issues include prehospital management, general issues in trauma assessment and resuscitation, impact of physiologic aging on response to injury, potential complications of preexisting medical conditions, and concerns regarding domestic abuse by the son.

Case Narrative: At 16:00 Mrs. Harvey, a 75-year-old woman, is brought to the ED by EMS with an EMS report of a fall from standing of unknown cause. On arrival the patient is supine and secured to a backboard with a cervical collar in place. Her left wrist is wrapped in gauze and the arm is immobilized in a splint. EMS has established a 20-gauge IV line in the right forearm and infused 250 cc of normal saline. Her speech is intelligible but she is slow to speak and appears somewhat confused, repeating the same questions over and over again. She is unable to provide her medical history or medication list and says to ask her husband for her med list. He has not yet arrived in the ED and is being brought in by the son. When he arrives he is able to provide a handwritten list of medications. If EMS is asked, they found the patient at the bottom of 2 to 3 steps into her living room. It is unclear where she was going and how she got there. The house was unkempt and on the cool side. The patient and her husband seemed to be wearing extra clothes to stay warm. She was found alert lying on her back complaining of back pain. Her husband called EMS when he said he heard a thump and found his wife on the floor. Her total down time was approximately 30 minutes after the fall.

Past Medical History
- Hypertension
- Atrial fibrillation
- NIDDM
- COPD

Meds
- Glucophage
- Coumadin
- Metoprolol
- “Inhalers”

Family and Social History: Lives at home with 78-year-old husband, who suffers mild dementia. She is his primary caretaker. She has one son who lives next door and two children who live out of state.

Physical Exam
- Patient is alert and verbal but confused to place and time, asks repetitive questions
- Airway is secure
- Skin is cool and dry
- HEENT: Small scalp hematoma
- Neck is nontender with no step-off
• Chest tender to palpation over left posterior chest wall; breath sounds are distant but equal bilaterally; normal heart sounds but tachycardic and irregular
• Abdomen nontender with normal bowel sounds
• Extremities: left wrist wrapped, but if unwrapped there is obvious “dinner-fork” deformity
• Back and spine are nontender
• Pelvis is stable
• Neuro: no focal deficits; speech slow; follows commands but not oriented to place and time and unable to give details of fall or medical history; GCS 13–14

Labs and Imaging
• Trauma labs: CBC, T&Cs, chem. 7, ETOH, CK, troponin, UA 10 RBC, 6 WBC
• EKG: rapid atrial fibrillation
• C-spine: limited secondary to DJD and patient unable to do open mouth
• CXR: 3 fractured ribs with effusion
• Pelvis: normal
• Head CT: normal with age-appropriate atrophy
• Wrist films: Colles’ fracture left wrist
• Ultrasound FAST exam: normal, no free fluid

Scenario Flow of the Case

Initial vital signs: T 96.8, Pulse 120 and irregular, RR 28, BP 110/60, POX 95% on 2L

1 minute: Primary survey should be initiated and completed. IV access should be established and EKG should be obtained. Initial labs and imaging studies should be ordered. Initial C-spine, CXR, and pelvis films will be obtained but not available yet.

5 minutes: After the primary survey the husband arrives in the emergency department and is able to give additional medical history and information. He is quite flustered and very concerned to know what is going on. If the participant asks to speak to the son, the patient gets very upset and says she doesn’t want him there because he gets very upset when she has to go to the hospital. If they attempt to find the son he has already left the ED after dropping off his father and is not reachable.

While talking to the husband the patient rapidly decompensates, becoming less responsive and dropping her blood pressure to 80/40 with a decrease in oxygen saturation to 90%. She continues to complain of left back pain. The initial CXR, if reviewed, shows a pneumothorax on the left. A repeat primary survey should be performed with the discovery of diminished breath sounds on the left with crepitus over the chest wall. A bedside FAST should be ordered. A D-stick should be obtained. Rapid needle decompression should occur with the subsequent placement of a chest tube. With needle decompression and chest tube placement the patient’s vital signs stabilize and she becomes increasingly more responsive.

If the participant decides to intubate the patient without discussing with the husband or completing a needle decompression or chest tube, the patient will further decompensate. The husband points out that the patient has a living will indicating that she is DNR/DNI and gets very upset.

15 minutes: The patient’s vital signs remain stabilized. A repeat CBC, if sent, shows a 2-gram drop in hemoglobin. A total of 500 cc of blood has drained through the chest tube. All imaging ordered becomes available. The patient should be appropriately triaged to the trauma ICU. Once the patient has been stabilized, the participant should speak with the husband and screen the patient’s home safety/risk. They should also screen for elder abuse and neglect by the son and contact the Department of Elderly Affairs.
Case Debriefing Points: Domain Management Model

I. Medical/Surgical Issues

**Why do we care how long the patient was down on the ground?** Geriatric patients are at risk of accidental hypothermia. Financial limitations may lead to inappropriate heating in the home.

**The patient’s presentation is frequently complex.** Common diseases present atypically in this age group.

**Trauma, especially from falls, is a frequently cause of death in the elderly.** Trauma is the 5th leading cause of death in patients >65 years old, who account for 12% of the trauma population but 28% of deaths. Often the cause of death is not the direct trauma but complications of the management. For each year over 65 the odds of dying from trauma increases 6% per year. Survivors often require long-term care. Injuries occur with the transmission of less kinetic energy than in younger adults, and the incidence of fractures is higher. Most commonly injured are the head and face, followed by the extremities. Alcohol and other drugs often contribute to trauma. Some studies suggest trauma team activation for any patient over 75 years with any trauma.

- The most common reason for trauma in the elderly is falls (60%). Falls occur in one third of independent persons >65 years old. Complications from falls are the leading cause of death from injury in men and women >65. Mortality is about 11%. Injuries of geriatric patients from falls are greater than in younger patients from similar falls.

- Intracerebral hemorrhage (ICH) can occur in patients with minor head trauma who are neurologically intact in the ED. This incidence increases in patients on antiplatelet agents or Coumadin. In a subset of the National Emergency X-Radiography Utilization (NEXUS) trial, 12.5% of patients >65 years were found to have ICH versus 7.9% in patients <65. Older patients also have twice the risk of C-spine fracture compared with younger patients, even after falls from a low height. Patients >65 are excluded from Canadian C-spine rules. Elderly patients were included in the NEXUS trial and 15% were found to have been intoxicated. Spinal cord injury without fracture is also common in the elderly: central cord or Brown-Séquard syndrome.

- Elderly patients with rib fractures have twice the mortality of younger patients (12% with 1–2 rib fractures, 40% with 7 or more fractures).

**The confounding effects of comorbid diseases must be considered.** Decrease in heart rate response to catecholamines, aging of the conduction system, and the use of beta-blockers blunt the cardiac response to trauma. Compensatory tachycardia to hypovolemia may be absent. EKG is mandatory in all trauma work-ups, to look for both a cause of the trauma and secondary consequences of trauma such as demand ischemia.

**Normal aging affects the airway.** Occult instability is common, airway reflexes are decreased, and the ventilatory response to hypoxia and hypercarbia is blunted. Pharmacologic therapy for RSI (not neuromuscular blockers) — reduce dose to prevent hypotension; a priming or defasciculating dose of paralytics may cause loss of the airway.

**Polypharmacy is common and may be a factor in presentation, diagnosis, and management.** Over 80% of patients evaluated after accidental fall are found to be on medications easily implicated in contributing to the fall: antidepressants, neuroleptics, sedatives, beta-blockers, diuretics, etc.

**Some diagnostic tests may have different normal values.**
### II. Mental Status/Emotions/Coping

Recognition of the possibility of cognitive impairment is important.

Health problems must be evaluated for associated psychosocial adjustment.

Fear of falling can inhibit social and functional status.

**Elder abuse is underreported and likely rising.** Only 16% of cases are reported. Risk factors include: female gender, age > 80, and physical and mental frailty. The perpetrator is often an adult child who is financially dependent on the victim and may have a substance abuse history and a prior history of violence. Look for bruises in multiple stages of healing, unexplained fractures, and signs of neglect such as dehydration, malnutrition, and bedsores.

Screening for elder abuse:
- Does anyone at home hurt you?
- Has anyone touched you without your consent?
- Has anyone made you do things you don’t want to do?
- Has anyone taken things away from you without asking?
- Has anyone ever scolded or threatened you?
- Are you afraid of anyone at home?
- Have you gone without food, medicine, or aids such as glasses?

### III. Physical Functioning

The likelihood of decreased functional reserve must be anticipated.

**A knowledge of baseline functional status is essential for evaluating new complaints.** Ask EMS: Does the patient live alone? Did it appear that the patient was unable to care for him/herself? Does it appear they were on the ground for a long period of time? Is there evidence of substance abuse? Do you have their meds? Was there a wheelchair or walker? Is the house safe?

Most deaths occur in the first 24 hours of admission and survivors suffer severe functional decline.

### IV. Living Environment

Social support systems may not be adequate and patients may need to rely on caregivers.

The emergency department encounter is an opportunity to assess important conditions in the patient’s personal life.
### Critical Actions Checklist

<table>
<thead>
<tr>
<th>Critical Action</th>
<th>Yes</th>
<th>No</th>
<th>Time</th>
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<tbody>
<tr>
<td>1. Uses 6 item cognitive screen</td>
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<td>2. Asks EMS for information about the scene of injury</td>
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<td>3. Performs age appropriate assessment and treatment Primary trauma survey is completed</td>
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<td>4. Removes patient from board as soon as possible and takes steps to warm patient</td>
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<td>5. Establishes cause of injury</td>
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<td>6. Obtains accurate temperature</td>
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<td>7. Determines impact of trauma on functional status</td>
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<td>8. Makes appropriate disposition</td>
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<td>9. Screens for elder abuse and notices old bruises and looks for old records</td>
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<td>10. Contacts social work for husband’s home care</td>
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<td>11. Assess risk of further injury</td>
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### RIHMSC Global Competency Scale

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<tr>
<td>Immediate critical EM actions</td>
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<tr>
<td>Appropriately targeted H&amp;P</td>
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<tr>
<td>Recognizes &amp; manages disease process</td>
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<tr>
<td>Considers differential diagnosis</td>
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<td>Communication skills</td>
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<td>Case synthesis</td>
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<td>Degree of expertise &amp; leadership</td>
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<td>Crisis management behaviors/Teamwork</td>
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<td>Safety Behaviors</td>
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## Description of Elements in RIH MSC Global Rating Scale

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<thead>
<tr>
<th>No.</th>
<th>Competency</th>
<th>Descriptor</th>
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| 1   | Immediate emergency medicine actions            | - IV, O2, monitor  
                                             - Immediate stabilization dependent on case                                                                                                                                                           |
| 2   | Appropriately targeted history/physical exam    | - History and physical based on case                                                                                                                                                                  |
| 3   | Recognizes & manages disease process            | - Completes all critical actions based on checklist in appropriate sequence and timeframe                                                                                                                |
| 4   | Considers differential dx                       | - Avoids premature diagnostic closure                                                                                                                                                                  |
| 5   | Presentation skills/Interpersonal relations     | - Quality of verbal presentation (assessment-oriented)\(^1\) = data content, expression, organization of medical decision-making, assessment-oriented presentation (patient ID, assessment & mgmt/therapeutic plan, limited justification based on H&P)  
                                             - Respectful interaction with patient  
                                             - Works effectively with ED staff                                                                                                                                                                      |
| 6   | Case synthesis/Cognition                        | - Recognizes diagnosis  
                                             - Appropriately dispositions patient  
                                             - Obtains all appropriate consults/follow-ups  
                                             - Recognizes unresolved issues  
                                             - Avoids common cognitive errors\(^2\)                                                                                                                                                                 |
| 7   | Degree of expertise/Leadership\(^3\)            | - Fluency: does the activity run together in an integrated and uninterrupted sequence with a minimum of pauses/hesitations?  
                                             - Automaticity: can practitioner deal appropriately with a situation even when not concentrating on or expecting it?  
                                             - Simultaneity: ability to complete several tasks at one time  
                                             - Rapidity: the ability to make an appropriate response quickly  
                                             - Knowledge base                                                                                                                                                                                      |
| 8   | Crisis management behaviors/Teamwork\(^4\)      | - Anticipation and planning  
                                             - Awareness and utilization of all available resources  
                                             - Distribution of workload and mobilization of help  
                                             - Routine reevaluation of the situation  
                                             - Awareness and utilization of all available information  
                                             - Triage and prioritization  
                                             - Efficient management of multiple patients  
                                             - Effective coping with disruptions/distractions  
                                             - Can add BARS assessment/MedTeams\(^5\)                                                                                                                                                                |
| 9   | Safety behaviors                                 | - Safe medication ordering (asks about allergies; knows indications/contraindications for therapy; communicates dose, route, and timing; knows patient weight)  
                                             - Any potentially harmful behaviors should be noted                                                                                                                                                     |
