



Cases/Questions and Answers

Geriatric Core - PGY 3 Seminar

Cases and Questions with Answers and Preceptor Notes for Discussion

Case 1

84-year-old female from home, where she is generally independent with her IADLs/ADLs, presents to your ED after a ground-level fall. Past medical history includes CAD, hypertension, spinal stenosis, peripheral neuropathy, osteoarthritis, TIA, cataracts and T2DM. Medications include metoprolol, ASA, solifenacin, gabapentin and gliclazide. The triage note states that she fell over in the kitchen while making lunch. On exam, you note a hematoma to the right temple but no focal neuro deficits. Non focal neck pain. Vitals as follows: HR 82, BP 120/70, O2 sats 100%, RR 16, T 37.1

1. What is your differential diagnosis for the cause of her fall?:

- **Atypical presentation of disease** - infections/sepsis, acute abdomen, electrolyte abnormalities, hypoglycemia
- **Cardiac** - dysrhythmia, ACS, orthostatic hypotension, carotid sinus hypersensitivity, CHF/peripheral edema
- **Neuro** - CVA, seizure, hydrocephalus, encephalopathy (e.g. hepatic), movement disorders (Parkinson's), neuromuscular disease, spinal cord compression, peripheral neuropathy, balance issues, slowed reflexes, cognitive impairment
- **Pulmonary** – COPD, pulmonary edema, pneumonia, hypoxia
- **Vascular** – pulmonary embolus, GI bleed, anemia, peripheral vascular disease, dehydration
- **MSK/Rheum** - Chronic pain, arthritis, joint replacements, decreased muscle mass, gait issues, polymyalgia rheumatica
- **Genitourinary** – urinary incontinence, urinary retention
- **Skin** – chronic wounds
- **Medications** – antihypertensives (beta blockers, calcium channel blockers, alpha 2 agonists, diuretics), hypoglycemics (sulfonylureas, insulin), sedatives (benzodiazepines), opioids, muscle relaxants, antidepressants (TCAs, SSRIs) and antipsychotics (atypical antipsychotics cause orthostatic hypotension in addition to sedation)
- **Tox** - alcohol, cannabis
- **Sensory impairment** - vision, hearing, proprioception/vibration
- **Environmental** – inappropriate footwear, poor lighting, loose rugs, mobility aids not being used or ill fitting, pets
- Vasovagal syncope or valsalva syncope (cough, micturition, defecation)
- Avoid term “mechanical fall”

2. What would you ask on history?

- HPI
- Past Medical History (including previous falls)
- Medications – emphasis on recent medication and dose changes
- Before the fall:
 - o Prodromal symptoms
 - o What were they doing just prior to the fall
 - o Review of systems/recent illness
 - o How do they mobilize at baseline, were they using mobility aid, etc.
- During the fall
 - o Witnessed? If so, attempt to obtain collateral
 - o Mechanism
 - o LOC
- After the fall
 - o Post ictal
 - o Able to get up? (Inability to get up and fear of falling are associated with increased future falls)
 - o Able to ambulate?
 - o How long were they down?
 - o Associated injuries

3. What aspects of the physical exam should be considered with an older patient presenting with a fall?

- Full head-to-toe trauma assessment – patient should be in a gown, full exposure
- Assessment of transfers and gait
- Neurological exam
- Orthostatic vital signs
- Consider brief cognitive screen
- Timed up and go (TUG) (*interactive idea- get a resident to do this while you time this as the demonstration)
 - o Meant to assess mobility and predict future falls
 - o Start with patient in chair-> on 'go' stand, walk 10 ft, turn and walk back then sit
 - o >12 s= increased falls risk
 - o Benefit- doesn't need to take any longer than doing a walk test!

4. What common injury patterns might you expect as a result of her fall?

- Head injury:
 - o Systemic review by de Wit et. al. (2020) showed incidence of ICH in older patients presenting to the ED after a fall was approximately 5.2% (majority of studies included patients on anticoagulants).
 - o Any sign of external head injury (e.g. hematoma) is one of best predictive factors for ICH

- IMPACT score (MD calc) can be used to predict mortality and unfavorable outcomes after TBI
- Cervical spine injuries:
 - Twice as common in older trauma patients
 - Higher incidence C1/2 injuries
 - Predisposed to spinal cord injuries without bony abnormalities due to cervical spondylosis (central cord syndromes, brown Sequard, etc.)
- Thoracic and lumbar spine injuries:
 - Compression fractures common. Considered fragility fractures. Significant cause of pain and morbidity.
 - [Jawa et. al. (2017). Spinal fractures occurred in 18% of 4,202 older adult patients admitted following fall <3 ft over a 10-year time period, in the following distribution: 43% cervical spine, 5.7% thoracic, 4.9% lumbar spine, 36% sacrococcygeal, and 9.6% multiple spinal regions.]
- Rib fractures – higher risk with blunt chest trauma
 - High associated mortality with rib fractures. Risk factors for death include age >65 years, ≥3 fractures, underlying CHF, and development of pneumonia. A 10-year retrospective study of younger (18-64) and older (>64) cohorts of patients with comparable injury severity scores found that 17% of the younger cohort developed pneumonia, compared with 31% of the older adults. The mortality rate was 10% for younger adults, and 22% for the elderly (p<0.01). Mortality and rates of pneumonia also increased with the number of fractures. For each additional rib fracture, the odds ratio of pneumonia was 1.16 and for death was 1.19.
 - Pain common cause of delirium
 - High risk, consider transfer to a trauma center if: ≥3 rib fractures or bilateral rib fractures or flail segment (≥3 contiguous ribs # in ≥2 or more place) or any number of rib fractures with significant underlying pulmonary disease
 - ED management goals: Early pain control with multimodal analgesia, access to regional analgesia, and regular pain assessments. This should include assessing pain at rest (static) and pain on deep breathing/coughing (dynamic). Need early mobilization and PT.
- Pelvis fractures
 - More likely to sustain lateral compression fractures of the pelvis associated with pelvic bleeding requiring transfusion and angiography. Consider binding the pelvis early in the resuscitation of the older polytrauma patient with overt or suspected occult hemorrhagic shock.
 - Stable pelvic fractures – consider CT imaging in patients unable to mobilize, as high rates of false negative on x-ray
- Hip fractures
 - Goal of surgical fixation within 24-48 hrs, increased risk of mortality if treated non-operatively. The HIP ATTACK RCT (2020) – accelerated care defined as time to OR < 6hrs vs. usual care, showed a lower rate of delirium (OR 0.72) and

decreased rates of stroke, infection and UTI. However, there were no differences in mortality.

- Strongly consider use of femoral or fascia iliaca nerve blocks for early analgesia

5. What investigations would you order?

- To look for the cause of the fall:
 - ECG, CBC, electrolytes/extended electrolytes, renal function, glucose
 - Consider +/- coags, tox panel, liver function, troponin, BNP, d-dimer, urine, holter depending on history/physical exam findings
- To look for injuries from the falls:
 - Extremity x-rays, CXR, CT head, CT c-spine, etc.
 - Age over 65 years is an independent risk factor for increased mortality in trauma, controlled for the same Injury Severity Score. Have a low threshold to complete CT trauma pan scan

6. What are some factors when considering imaging for potential head injuries in older adults?

- Canadian CT head rules
 - Inclusion
 - Requires head injury <24H + LOC/amnesia/disorientation + initial ED GCS 13-15
 - Medium risk criteria:
 - amnesia 30+ min before impact
 - dangerous mechanism (ped struck, ejection, fall 5+ stairs/3ft)
 - High risk: age 65+, GCS <15 @2H, signs basal skull, suspected open/depressed skull, vomiting 2+
 - Exclusion (highlights)?
 - Bleeding disorder or anticoagulation, focal neuro deficit, unclear hx of trauma as primary event, seizure prior to ED assessment, return for reassessment

* Note: working on developing rules that could apply to older patients

- Factors that increase risk of ICH in older patients – in addition to Canadian CT head rule factors...new neurological symptom, head bruise/hematoma. Additional factors to consider: chronic renal insufficiency, anticoagulation use, antiplatelet use (excluding ASA), age >75, frailty
- Factors that decrease risk of ICH in older patients – age 65-75, concomitant wrist or hip injury, no external signs of head injury

7. What are some factors when considering imaging for potential cervical spine injuries in older adults? What clinical decision rules can we use in our assessment of cervical spine injuries? How do these apply differently to older patients?

- We must thus use caution when applying it as the population studied might not be the same as the population we're applying it to
- Based on previous small studies, elderly patients with c spine fractures often don't have midline tenderness

Stimulus question: Should we CT all patients age 65+ who sustain trauma to head/neck? Why or why not?

- Shared decision-making. Factors to consider often include if patient has reliable caregiver at home to monitor for any changes in mental status, anticoagulation, mechanism of injury, absence or presence of symptoms, injury severity score.
- Healey et. al. (2017) - Of 173 patients age 55 and older with c-spine fractures, 36 (21%) were asymptomatic and reported no neck pain on presentation or on examination. The group without neck pain had higher median injury severity scores, were more likely to have another injured body region (69% vs 42%; $p = 0.004$).
- Strongly consider in any geriatric trauma patient who is undergoing a head CT for trauma should also undergo cervical spine imaging
- For those who are ambulatory, do not meet high risk criteria of the Canadian C-Spine rule, have no signs of trauma above the clavicle, and on reliable examination have no c-spine tenderness or paresthesias, c-spine imaging may be deferred

Stimulus question: What might be some associated risks of placing older patients in a C collar (with the associated delay to clearance)?

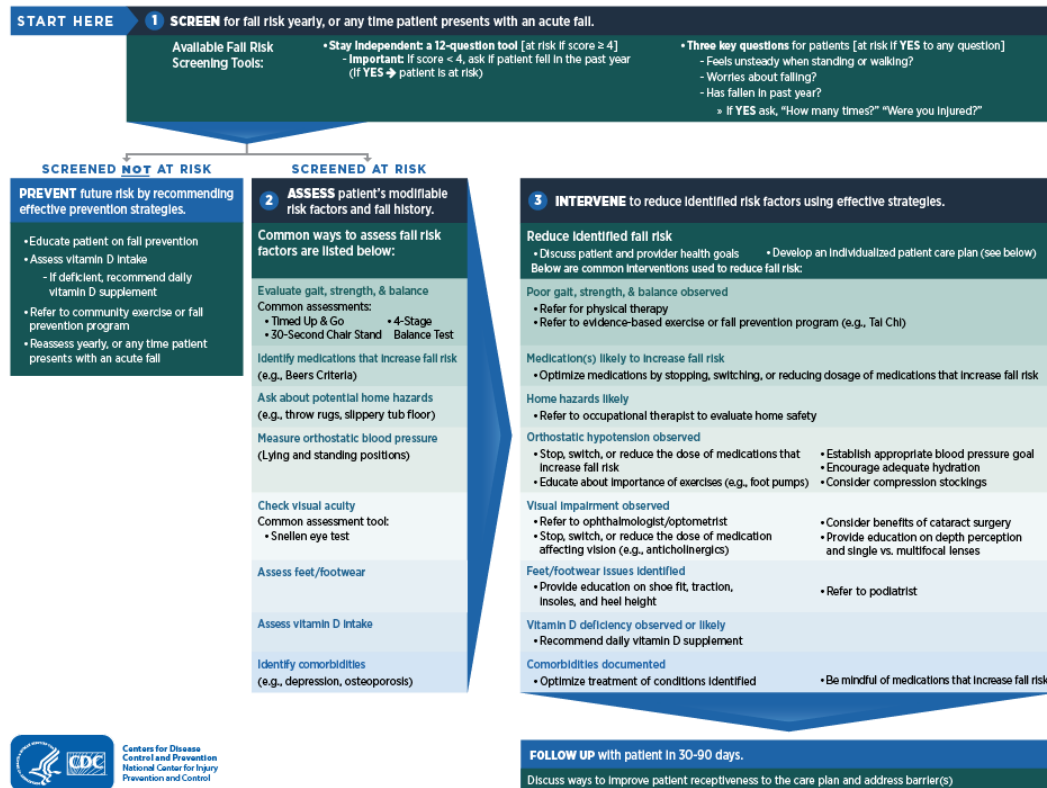
- Pressure ulcers, dysphagia, aspiration, malnutrition, deconditioning, respiratory failure, agitation, and delirium
- Consider changing rigid collar to Aspen or Philadelphia collar. With cervical kyphosis, hard collar creates distortion. If no Aspen or Philadelphia collar, consider sandbags.

8. What can we do in the ED to help prevent future falls? (This can include referrals and involvement of other team members)

- Identify patients with high falls risk – those with previous fall with injury, two or more falls in the past year, gait/balance disturbance, frailty (Clinical Frailty Scale 4-9)
- Medication review, flagging for primary care provider (metoprolol, gabapentin, glyclazide, solifenacin); consider deprescribing
- Provide practical tips - sit for one minute before standing, use gait aid, avoid poor footwear
- Education – home hazards modification (lighting between bedroom and bathroom, avoid loose rugs, etc.), falls alert devices, exercise and balance training
- Safe discharge planning – consider need for additional home care supports, adjustment of home environment/new equipment, assessment of pre-injury ADLs/IADLs
 - Patient must be able to (with or without support) manage meal prep, housekeeping and medications in addition to ADLs for successful discharge
 - Patient must be able to ambulate and transfer independently for successful discharge

- Involve other team members based on the situation: helpful when considering individual patient risk factor assessment, disposition planning and education
 - Pharmacist
 - Physio
 - Home OT referral (or in the ED) for safety assessment/falls risk
 - Liaison, transition supports or community-based care coordinator
 - Focused practice (GEM) nurse
 - Social work
 - Exercise or falls prevention program
- Falls prevention program (looks at balance, hand reaction time, quads strength, proprioception, depth perception) and comprehensive geriatric assessment (med review, function, falls risk, etc.)
 - Osteofit suggested as exercise intervention - basically exercise classes offered at community centers with an aim to improve ability to do day to day activities, reduce risk of falls/fractures
 - Designed at BCWH osteoporosis program
 - Find a class (has all our health authorities):
 - <http://www.bcwomens.ca/our-services/population-health-promotion/osteofit#Find--a--class>
- Example VGH specific - falls clinic
 - Eligibility includes 65+, fall in last year (especially if #), no neuro condition, no dementia, ambulatory (can use gait aid), life expectancy 1 year+, English or has interpreter

STEADI Algorithm for Fall Risk Screening, Assessment, and Intervention among Community-Dwelling Adults 65 years and older



Case wrap-up:

You note multiple potential etiologies for her fall, including medications, vision impairment, neuropathy, spinal stenosis and environmental factors. You obtain a negative CT head and c-spine which shows an odontoid fracture. On further history, she endorses multiple recent syncopal events with no associated prodrome, including while supine. You are concerned for cardiac syncope (noting history of CAD). Cardiology is reluctant to see the patient, but you advocate that she would be a good candidate for intervention (low frailty score and independence). She receives a pacemaker and is discharged home 5 days later with a c-spine collar and additional home care supports in place.

*Note: also important to keep in mind that you may be seeing fragility fracture within the ED- ie fractures resulting from low energy trauma (standing height or less)

- These include vertebral, hip and distal forearm
- If they have a fragility fracture, you have diagnosed osteoporosis- ie a bone mineral density test is not required
- Should counsel exercise, vitamin d if not taking and f/u with family physician for consideration of further therapeutics (e.g. bisphosphonates)

Case 2

79-year-old male presents to the ED after a standing level fall at home. He arrived alone, and was coherent and communicative several hours earlier, but while in the waiting room the triage nurse noted a rapid change in consciousness. He became agitated, non-verbal and was resisting care. He is brought to a monitored bed, and when you see him he is unable to tell you what happened.

PMHx: atrial fibrillation, hypertension, dyslipidemia, generalized anxiety disorder

Meds: warfarin, ramipril, rosuvastatin, lorazepam

NKDA

Exam:

Vital signs at triage – T37C, HR 70, BP 190/125, RR 25, 96% on 2L O2

Neuro – eyes open, looking around, PEARL. Bruise to left temple, no boggiess. Alert but confused. Moving all four extremities.

Cardio & Resp – normal

Abdo – normal

Bloodwork (CBC, lytes, glucose, BUN, creat, CK, troponin, INR) were sent by the triage nurse and are pending.

- 1. What is your initial management plan regarding this patient? What additional investigations do you order?**

The patient's presentation is concerning for a head injury with altered mental status. He is anticoagulated. The main differential at this time is an intracranial event, and this should take priority in regards to investigation, however other differentials should not be ruled out as this patient may have delirium, be intoxicated, etc. Keep a broad differential.

- IV access x 2
- CT head – consider if you will need sedation +/- intubation to complete this safely
- ECG
- CXR
- Add LFTs, tox labs, extended lytes
- BP lowering, presentation concerning for hypertensive emergency – IV labetalol
- Call the family to establish goals of care if MOST status is not previously documented (it is not in this case)

While the patient is away at CT his initial bloodwork comes back – his HgB is 122 and his INR is 2.9.

The resus nurse informs you that the patients family have been contacted and are on their way to the hospital. The family said that they had spoken to their father earlier, and that he mentioned he had a fall while shovelling snow and had a headache.

You are then called to CT as the patient has become combative and is flailing his arms and legs everywhere. He cannot be calmed. The radiology tech informs you that they were able to get most the images of the scan and tells you there is a large ICH without evidence of midline shift or herniation.

2. How do you proceed with the management of this case?

- Return the patient to the resus room. If no family is present and as goals of care are unclear, you decide to intubate the patient using an RSI and neuro-protective strategies.
 - o Preoxygenate if possible without putting patient at risk
 - o Call for RT if not already present
 - o Elevate head of bed to 30 degrees
 - o Ketamine (or propofol or etomidate) + rocuronium
 - o Target PaCO₂ 35, sats >95%
- Reversal of Warfarin – vitamin K and prothrombin complex concentrate
- Control BP (target sBP<180) – use caution when giving an anti-hypertensive prior to intubation if intubation is imminent as in this case, as may impact peri-intubation risk/arrest, significant risk of post-intubation hypotension
- Consult ICU, neurosurgery
- Establish GOC with family ASAP

If not wanting to intubate, can use 3-4 mg midazolam IV to get them through CT scan. Use O₂ sat and end tidal CO₂. Have RT go with you.

3. In your attempts to intubate this patient, what unique anatomical or physiologic factors should you consider and what is your plan to address each of these factors? (be specific)

- Edentulous – put their dentures in while bagging, remove during intubation
 - o If there are no dentures and you can't get a good seal, there is a technique described by Racine et. al. where you slide the BVM up slightly to rest on the lower lips, which may help create a better seal.

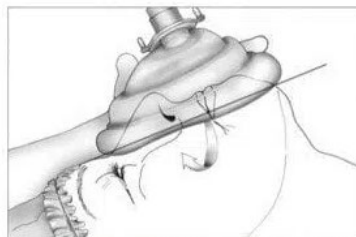


Fig. 1. Illustration of the position of the face mask. The standard face mask ventilation consists of placing the thumb and index finger on the body of the mask, whereas the other fingers move the mandible toward the upper teeth and extend the head. The continuous line represents the plane between the nose and the mandible. The arrow represents air leaks. Only one hand is pictured, and the oropharyngeal airway has been removed to see the position of the mask.

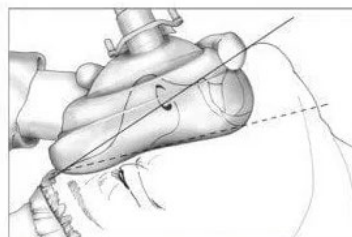


Fig. 2. Illustration of the position of the face mask. The mask was moved in the lower lip placement by repositioning the caudal end of the mask above the lower lip while maintaining the head extension. The continuous line represents the plane between the nose and the mandible. The dashed line represents the contact achieved between the mask and the face. Only one hand is pictured, and the oropharyngeal airway has been removed to see the position of the mask.

Fom Racine SX, et al (2010)

- Decreased mobility of c-spine and temporal mandibular joint - arthritis, degenerative changes, kyphosis, etc. are common and affect your ability to manipulate the airway and neck. We may also not want to do much neck manipulation if there are any concerns about trauma given the high prevalence of fractures. For both of these reasons, having a smaller blade as back up, consider using a hyper-angulated video laryngoscope and a bougie
- Cervical kyphosis, pre-existing neck malignancies or prior surgeries/radiation may distort the normal cervical anatomy, which may make obtaining a surgical airway more challenging
- Friable airway mucosa, especially in patients who are anticoagulated – have suction available
- Difficulty pre-oxygenating and fast desaturation due to:
 - Lung parenchymal changes = impaired gas exchange and diffusion capacity, reduced PaO₂. Baseline lower oxygen saturation potentially.
 - Decreased lung elasticity and increased ventilation-perfusion mismatch due to collapse of small airways, increased physiologic dead space while surface area decreases
 - ↓ vital capacity/lung reserve – decline in maximal inspiratory and expiratory force
 - ↑ incidence of lung disease
 - ↓ cough and gag reflexes
 - ↓ mucociliary clearance
 - Chest wall changes - chest wall stiffens, decreased compliance of ribs
 - Ways of mitigating this include use of a PEEP valve (keeps alveoli open, promotes gas exchange and oxygenation), sit patient upright for pre-oxygenation (helps to recruit posterior aspects of the lung)
- Rates of hiatal hernia increase with age - insufflating the stomach during BVM may increase the risk of aspiration. If you need to bag, consider using an LMA to direct air into the lungs in the patient who will tolerate it
- Older adults rely on maintaining their stroke volume (SV) to maintain their cardiac output (CO), due to more difficulty increasing their heart rate ($CO = SV \times HR$). A critical component of SV is preload and older adults have increased sensitivity to changes in volume. Typically there are increased rates of diastolic dysfunction and less cardiac responsivity to sympathetic stimulation.
 - Resuscitate your patient before you intubate (e.g. fluids, blood, pressors)
 - Consider small fluid bolus, assessment of volume status with POCUS
 - Caution with fluid resuscitation in patients with certain comorbidities – CHF, critical aortic stenosis, pulmonary hypertension, cirrhosis
 - Consider norepinephrine unless patient bradycardic, then consider epinephrine. However, you may not get the same response as with younger patients due to stiffer pump/pipes. And there is also an increased risk of arrhythmias. Good practice is to use the lowest level of vasoactive agent to achieve your target MAP and correct any obvious causes of arrhythmias

- Reduce dose of induction agents to avoid hypotension. If using propofol, consider dose of 0.5-0.75 mg/kg). Consider dose of reduction of ~50% with ketamine and etomidate as well.
- When you use paralytics, the negative inspiratory pleural pressure is taken away, which can quickly drop preload and CO. Because of decreased CO, you will need to increase the dose of your paralytic in order for it to be most effective and increase potential for first pass success. Consider dose of rocuronium 1.2 mg/kg.

The patient's wife and daughter arrive shortly following intubation of the patient.

4. Outline how you will proceed with a goals of care discussion:

- Example: consider SPIKES (setting, perspective/perception, invitation, knowledge, empathy/emotion, summary/strategy) approach for delivering bad news
- Quiet setting, minimize interruptions
- Involve social work if available. Check in if SDM has support person
- Communicate clearly, using short phrases and non-medical jargon
- Ask what they already know
- Use language reinforcing that treatment and care are continuing even if the goals are changing



- Prognosis is best conveyed in ranges, such as hours to days, days to weeks or weeks to months. Prognosis is not static and may change with time and alterations in the patient's condition.
- **Step 1** – determine if GOC discussion is time sensitive
 - o Yes in this case
- **Step 2** – determine if patient is known to have a terminal disease or palliative goals of care already
 - o No in this case
- **Step 3** – prognosticate...would your patient benefit from critical care? Consider the nature of the acute illness, the patient's baseline function and comorbidities, and their overall trajectory of life and function.
 - o In this case, would need more information from neurosurgery, ICU but potentially. Also helpful to ask family what the patient's functional baseline and quality of life is like. He was reported to have been shovelling snow, which would indicate a higher level of pre-morbid function.
- **Step 4** - Speak to the patient/family to understand values and wishes around quality of life
- Some key phrases may be helpful in talking to substitute decision makers:
 - o I am really worried about <the patient>, he/she is really sick
 - o Would you be able to tell me about how things are going at home – what is <the patient's> day like on a good day?
 - o If <the patient> could have this conversation with us, what would <the patient> say about this situation?
 - o I can't imagine how difficult it must be to try to speak for <the patient>
 - o Thank you for being here for <the patient>
 - o Would it be ok for me to share my recommendation as to how to best care for <the patient>?
- **Step 5** – Counsel SDMs. Combine your medical expertise and thoughts around the risks/benefits of CPR, intubation, or other critical care interventions you are proposing to form a recommended course of treatment.
- **Step 6** – Document and set the expectation that this is dynamic and may change as the inpatient teams understand more about the patient's illness

Stimulus Question – What are some barriers to GOC discussion in the ED? What are some advantages?

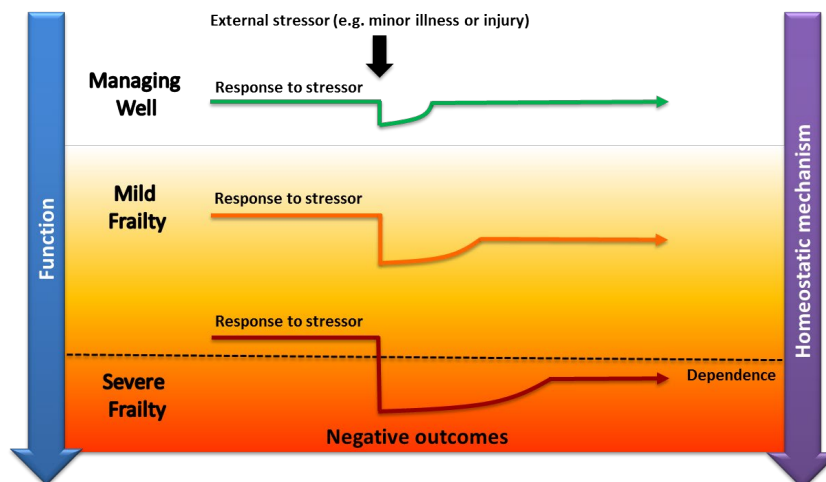
- Barriers – lack of time and appropriate physical space; absence of family or SDM; lack of advanced directive; family disagreements; patient's PMHx not always available; chaotic ED environment; patient/family having difficulty accepting prognosis, having difficulty understanding limits of life sustaining measures; lack of training or physician discomfort
- Advantages – good patient-centered care; reduced LOS, reduction of ICU days, cost reduction, improved patient/family satisfaction

5. What is ageism in healthcare? What negative consequences does ageism have on outcomes for older adult patients? What are some strategies to mitigate this?

- Ageism is defined as stereotyping, prejudice, or discrimination toward people on the basis of age. It is well known to affect the quality and quantity of care older people receive and in turn leads to negative health outcomes
- Assumptions regarding functional and cognitive decline lead to more limited provision of medical information, withholding certain treatment options, and exclusion from clinical trials
- Need to perform individualized, patient-centered approach to care. Avoid standardization of assessment and treatment processes. Take the time to determine accurate pre-morbid function, cognitive baseline and make recommendations that take into account patient's values.

6. What is frailty? How do we objectively screen for it in the ED? What are the implications of a higher frailty score in our patient?

- Frailty is broadly defined as a state of increased vulnerability and functional impairment caused by cumulative declines across multiple systems. Frailty is a geriatric syndrome and may include loss of muscle mass and strength, reduced energy and exercise tolerance, cognitive impairment, and decreased physiological reserve, leading to poor health outcomes and a reduced ability to recover from acute stress. Frailty exists on a spectrum and while it is often chronic and progressive, it is also dynamic and some patients may be able to improve their frail status.



- Can screen for frailty using validated ED tools – ISAR (Identification of Seniors at Risk, score ≥ 2), CFS (Clinical Frailty Scale), interRai ED screener (app)

Identification of Seniors at Risk (ISAR)

1. Before the illness or injury that brought you to the Emergency, did you need someone to help you on a regular basis?	☐ YES ☐ NO	1 0
2. Since the illness or injury that brought you to the Emergency, have you needed more help than usual to take care of yourself?	☐ YES ☐ NO	1 0
3. Have you been hospitalized for one or more nights during the past 6 months (excluding a stay in the Emergency Department)?	☐ YES ☐ NO	1 0
4. In general, do you see well?	☐ YES ☐ NO	0 1
5. In general, do you have serious problems with your memory?	☐ YES ☐ NO	1 0
6. Do you take more than three different medications every day?	☐ YES ☐ NO	1 0

Clinical Frailty Scale*



1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



2 Well – People who have **no active disease symptoms** but are less fit than category 1. Often, they exercise or are very **active occasionally**, e.g. seasonally.



3 Managing Well – People whose **medical problems are well controlled**, but are **not regularly active** beyond routine walking.



4 Vulnerable – While **not dependent** on others for daily help, often **symptoms limit activities**. A common complaint is being "slowed up", and/or being tired during the day.



5 Mildly Frail – These people often have **more evident slowing**, and need help in **high order IADLs** (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



6 Moderately Frail – People need help with **all outside activities** and with **keeping house**. Inside, they often have problems with stairs and need **help with bathing** and might need minimal assistance (cuing, standby) with dressing.



7 Severely Frail – **Completely dependent for personal care**, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.



9 Terminally Ill – Approaching the end of life. This category applies to people with a **life expectancy <6 months**, who are **not otherwise evidently frail**.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

* 1. Canadian Study on Health & Aging, Revised 2008.

2. K. Rockwood et al. A global clinical measure of fitness and frailty in elderly people. CMAJ 2005;173:489-495.

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- In general, frailty is a significant predictor of many adverse outcomes including increased rates of institutionalization and **mortality**. In a retrospective single center observational study, frailty was not associated with mortality following ICH, nor was frailty associated with post-stroke mRS (characterization of functional independence) after adjustment for the Intracerebral Hemorrhage Score. Higher frailty scores were associated with lower rates of surgical intervention, and in those with more extensive

ICH the frailty scores were higher in those who died following withdrawal of care versus those who died despite active management. In those undergoing surgery for spontaneous ICH, frailty was independently associated with higher mortality and poorer long-term neurological recovery 6–8 months after ICH.

7. What is the CTAS frailty modifier?

- Revision of the 2016 Canadian ED Triage and Acuity Scale (CTAS) in order to address concerns that frail patients are more prone to deterioration with long waits to be seen. The frailty modifier was developed to help identify these patients and up-triage them to a CTAS level 3 (from a CTAS 4 or 5) to ensure they don't get missed. Developed in collaboration with CAEP.
- Defined as any patient completely dependent for personal care; who is wheel-chair bound; suffers from cognitive impairment that limits their awareness of their surroundings or ability to appreciate time; is in the late course of a terminal illness; is showing signs of cachexia and general weakness; or is over the age of 80 unless obviously physically and mentally robust

Case 3

80 year-old female presents after a fall at home and is brought in by EMS. EMS reports that the patient fell down a few stairs in her back yard. She has been complaining of right sided upper abdominal pain since the fall and they noted bruising to her right jaw. The patient was able to stand with assistance after the fall and slowly ambulate to the stretcher but is in obvious discomfort. She informed EMS that she had been having intermittent palpitations and dizziness for several days prior to the fall but did not think she lost consciousness around the time of her fall.

Vital signs: T35.6 HR 95 BP 105/55 RR 24 O2 sat 91% on RA

PMHx: atrial fibrillation, previous lacunar stroke, type 2 diabetes, hypertension, COPD

Meds: rivaroxaban, metoprolol, metformin, glimepiride, candesartan, amlodipine, tiotropium bromide, salbutamol

1. What are the Ohio Trauma Triage Criteria for Older Adults?

- Trauma patients age 70 and older with the following criteria are recommended to be transported to a trauma center:
 - Pedestrian struck at any speed
 - Fall from any height including standing falls with evidence of head trauma
 - Trauma in a patient with GCS ≤ 14 with known or suspected head trauma
 - Fracture of 1 or more proximal long bones
 - Injury sustained in 2 or more body regions
 - Systolic blood pressure < 110 mmHg

- Criteria increases the sensitivity for severe injury in geriatric patients by 32%
- Observational studies suggest as much as a 25% reduction in mortality, a reduction in delirium (51 vs 41%, $P = 0.05$) and fewer discharges to long term care (6.5% vs 1.7%, $P=0.03$) when injured older patients are cared for at a trauma hospital

Stimulus question: How might frailty be relevant in predicting morbidity and mortality in geriatric trauma?

- Frailty is an independent predictor of in-hospital complications and adverse discharge disposition in geriatric trauma patients. Frailty indices may be more predictive of death from trauma than initial injuries or vital signs in this population.
- While frailty, age and co-morbidities are risk factors for poor outcomes after trauma, there is no tool or score that can accurately prognosticate the older trauma patient in the first few hours in the ED. Treat every patient with the benefit of life and engage patients and family soon after your initial trauma resuscitation.

2. What aspects of this patient's presentation might indicate higher risk of morbidity and mortality?

- Shock index 0.9. Consider use of age-adjusted shock index ($\text{age} \times \text{HR/sBP}$). If >50 , high suspicion for occult shock. This patient's is 72.
- sBP <110
- Anticoagulation
- Mechanism
- Age

3. What are special considerations in your approach to the primary and secondary surveys in the geriatric trauma? (Think changes in physiology with aging as well as associated medical comorbidities and polypharmacy)

- **Respiratory:** Lower pulmonary reserve with impaired ability to compensate for pulmonary injuries. In non-intubated patients, it is important to follow respiratory rate closely, as these patients are more likely to tire and decompensate as a result of pulmonary injury (e.g. contusion) or aggressive fluid resuscitation. Just the act of immobilizing an older patient flat on the stretcher can impair respiration. Rib/sternal fractures may cause rapid deterioration. End-tidal capnography is highly recommended for older adults if there is concern for underlying lung disease (COPD, pulmonary fibrosis, or pulmonary hypertension), thoracic injury (rib fractures or pulmonary contusions), or if analgesia and sedatives are provided.
 - o RR may be normal while still experiencing hypoxia/hypercarbia
 - o O₂ sat may be lower due to underlying lung disease (think COPD)
- **Cardiac:** Decreased cardiac function – “normal” vital signs are not reassuring in the geriatric population, adjusted parameters for heart rate and blood pressure (HR >90 , SBP <110 mmHg) have been posited to avoid relative hypotension and “occult” hypoperfusion, a finding associated with double the odds of death. In addition to trending vital signs and reviewing past medical records for baseline levels, trending

lactates to assess adequacy of perfusion and resuscitative efforts can serve as a useful adjunct in the medical management of these patients.

- Blood pressure can be affected by antihypertensives. Increased concern with sBP <110 or drop in sBP >40 from baseline.
- Heart rate can be affected by calcium channel blockers, beta blockers, comorbidities such as CHF, ACS. Increased concern with HR >90. CCB and BB in particular can significantly limit physiologic responses to hemorrhagic shock.
- Also important to consider shock index; base deficit – marker of mortality and prolonged ICU stay. Serum lactate (>2) or base deficit (<-6) are associated with major injury and mortality in trauma patients and may be present even in older trauma patients with normal/near normal vital signs and low impact injury (e.g. ground-level fall)
- Narrow window of volume resuscitation, consider placement of arterial line, frequent volume status reassessments clinically and by POCUS
- While blood products are generally favoured over crystalloid in the hypotensive young trauma patient, elderly trauma patients are often fluid deplete at baseline and may be on diuretics that further worsen their volume status. In the elderly trauma patient, it is reasonable to give a small bolus of crystalloid (250-500cc) and reassess their volume status during the initial resuscitation.
- **Hematology:** Bleeding risk increased in patients on anticoagulants. Anticoagulants increase the likelihood of morbidity and mortality when compared to younger patients with similar initial injury severity scores. Always consider need for reversal of anticoagulation - vitamin K with prothrombin complex concentrates for warfarin, protamine sulfate for LMW heparin, praxbind for dabigatran, andaxanet alfa for rivaroxaban and apixaban. Fresh frozen plasma is an alternative to PCCs, but requires longer infusion times and significant infusion volumes, which may not be tolerated in older adults with congestive heart failure, renal disease, or liver disease.
- **Neuro:** GCS is not as good a predictor for severity of injury in older adults as in younger adults, as a good GCS (14-15) does not correlate with severity of injury on CT for older adults. In addition, baseline neurological function can be complicated by comorbid conditions such as underlying cognitive impairment or acute delirium from the injury. Any altered mental status, including amnesia to the event or confusion should be evaluated as a potentially traumatic brain injury. Brain volume loss predisposes to tearing of bridging veins in head trauma and subdural hematoma. Given larger potential space for bleeding patient may be asymptomatic and presentation may be delayed.
- **Skin:** Remove from spinal board ASAP. Full skin exam is important as bruising and lacerations can be easily missed, as can pressure ulcers from prolonged backboard/cervical collar use. Also, the skin exam can give insight into the cause of a fall or inform concern about elder abuse/neglect as causes of injury. Minimize exposure time. Many older adults experience an age-related decline in thermoregulatory capacity and muscle mass. Oral and axillary temperatures can be less reliable (artificially low) in older adults, especially if the person is mouth breathing due to altered mental status, pulmonary disease, or acute injury. Rectal temperature is more accurate.

- **MSK:** Increased risk of osteoporosis and fractures with lower mechanism of injury
- The stable geriatric trauma patient requires a thorough secondary assessment for both causes of the injury and concomitant medical conditions that may contribute to their current presentation. Injuries may be preceded by emergent conditions such as MI, stroke, dehydration, pulmonary embolism, sepsis, and intentional- or accidental- pharmacologic overdose. It is important to consider these precipitants when evaluating these trauma patients to appropriately stabilize and treat them in the hospital, as well as in preventing future falls and injuries.

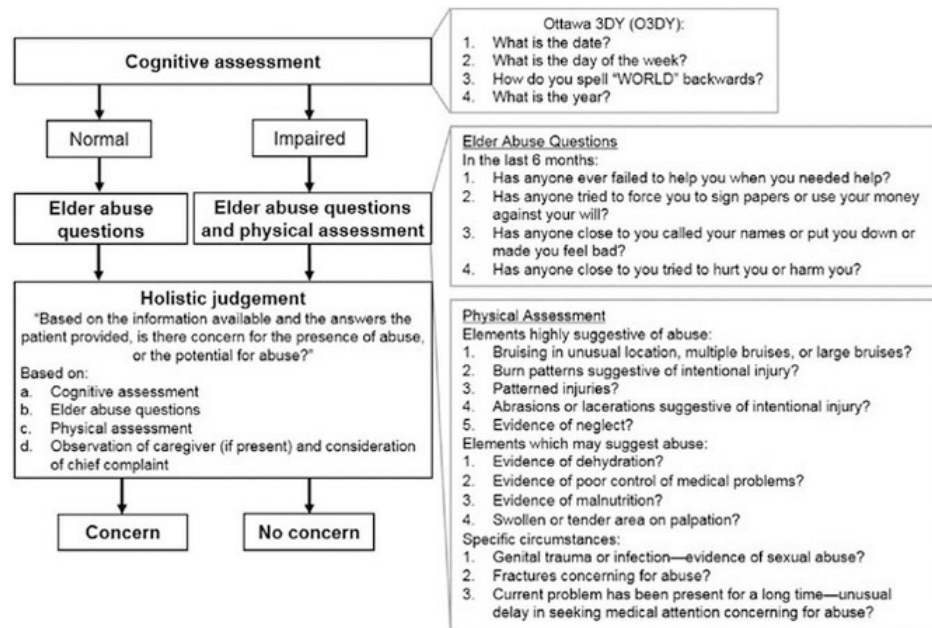
4. What are the benefits of involving a geriatric multidisciplinary team early in the care of the older adult trauma patient?

- Decreased incidence of delirium
- Decreased hospital LOS and rates of discharge to long-term care
- Ability to perform a detailed falls risk assessment with focus on functional status and rehabilitation
- Cognitive assessments
- Comprehensive medication review, including medications that may contribute to falls risk, with appropriate deprescribing
- Safe discharge plan including assessment of ability to perform or has assistance with ADLs, and a discussion with patient and caregivers regarding plan of care, new medications, and follow-up plan

During your assessment of this patient, you note that she looks unkempt. There are multiple bruises of different ages, including the bony and non-bony areas of bilateral arms, upper right side of her abdomen, and right submandibular area.

5. What further questions might you ask the patient once she is deemed to be stable and you have completed your primary and secondary surveys?

- Screening questionnaire for elder abuse. *If time, suggest role playing this out.*
 - o Elder Mistreatment Brief Screen – 3 questions: has anyone close to you harmed you? Has anyone close to you failed to give you the care that you need? Has anyone tried to force you to sign papers or use your money against your will? Further red flags include repeated visits to the ED, frequent or unexplained injuries, history or signs of cognitive impairment, delayed attention to or unmet health needs
 - o ED Senior Abuse Identification tool (ED Senior AID tool) – validated in ED setting. Excellent inter-rater reliability, and had a sensitivity and specificity of 94% (95% confidence interval (CI) 71-100%) and 90% (95% CI 85-93%), respectively.



6. What are potential risk factors for elder abuse?

- Patient-related factors: functional dependence or disability, poor physical health, cognitive impairment, poor mental health, low socioeconomic status, social isolation, previous history of family violence, previous traumatic event exposure, substance abuse
- Perpetrator factors: caregiver burnout, mental illness, substance abuse, financial/housing or other dependence on older patient

7. What are concerning history and exam features that should prompt you to consider elder abuse?

- On medical history: poor living conditions according to collateral; unexplained injuries; past history of frequent injuries; delay between onset of medical illness or injury and seeking of medical attention; recurrent visits to the ED for similar injuries; using multiples physicians and EDs for care rather than primary physician; noncompliance with medications/appointments/physician recommendations; patient or caregiver reluctant to answer questions; strained patient/caregiver interaction; inconsistent history of injury mechanism between the patient and caregiver; patient referred to as "accident prone"; caregiver not able to give details of the patient's medical history or routine medications; caregiver answers the questions regarding the patient; abandonment of the patient in the ED by the caregiver
- Evidence of multiple injuries at the same time—either of the same type (e.g., multiple bruises) or of different types (e.g., bruises and lesions)
- Multiple injuries at different stages of healing. This would be consistent with multiple episodes of abuse over time in contrast to multiple injuries resulting from a single accident
- May display injuries with marks that indicate a specific method and/or instrument(s) of abuse. Examples include: bite or restraint marks; bruising with fingertip patterns,

including on the throat (e.g., strangulation); burns consistent with forced immersion in hot water (e.g., glove pattern for hands, stocking pattern for feet); any injuries that appear in the shape of an object (e.g., bruising in the shape of a shoe tread or belt buckle, burns consistent with a cigarette or curling iron)

- Signs of neglect: Pressure sores or ulcers may be unavoidable under certain circumstances. However, failure to recognize and appropriately treat such wounds suggests neglect. Maceration (skin that feels soft, wet, or soggy) around such wounds is a related red flag. Cachexia/malnutrition, dehydration, poor body hygiene, unchanged diaper, elongated toenails, poor oral hygiene
- May display injuries in specific, and sometimes unusual, locations. Examples include: inner arms, back, ears, neck/throat (e.g., strangulation marks), scalp (e.g., traumatic hair loss), face, including in or around the eyes (e.g., ophthalmic hemorrhages, petechiae) or mouth (e.g., traumatic intraoral soft tissue injuries, traumatic tooth loss).
- Wrist or ankle lesions or scars (suggesting inappropriate restraint)
- Genital, rectal or oral trauma

Stimulus question: What is your responsibility as a physician in a case of elder abuse and what resources are you able to provide her with?

- Mandatory reporting only for adults who do not have capacity or ability to seek help due to a physical restraint, a physical handicap, an illness, disease, injury or other condition that affects their ability to make decisions. Mandatory reporting also for older adults living in institutional care facilities (e.g. LTC)
- **Practical application for practice** – need to determine capacity. If they have capacity and are able to seek help if they choose, provide them with supports, no mandatory reporting.
- All adults are entitled to live in the manner they wish and to accept or refuse support, assistance or protection *as long as they do not harm others and they are capable of making decisions about these matters*. All adults should receive the most effective but the least intrusive and restrictive form of support, assistance or protection when they are unable to care for themselves or their financial affairs. According to these principles, even if an adult seems to be in an abusive or neglectful situation, he/she has the right to decide whether to accept or refuse offers of help if he/she is capable of making such decisions
- If a designated agency receives a report about an adult, that agency has a legal responsibility to look into the situation and to talk directly with the adult, involving him/her as much as possible in addressing his or her situation. The designated agencies in BC are: the five regional health authorities; providence health care society (some hospital settings in Vancouver); and community living BC (for adults who are eligible for these services). Designated agencies work with the adult to give the kind of support that he/she wants and needs. *If the situation cannot be resolved informally, is urgent or dangerous, and the designated agency is concerned that the adult seems unable to get assistance on his/her own due to a physical restraint, physical handicap or an illness,*

disease, injury or other condition that affects his/her ability to make decisions, the AGA gives designated agencies legal tools to protect adults.

- Reference: Part 3 of adult guardianship act in BC: Support and Assistance for Abused and Neglected Adults.

Seniors Abuse & Information Line (SAIL) – 0800-2000 7 days a week (except holidays). Language interpretation available Mon-Fri 0900-1600. Patients are able to call this line directly for support. 604-437-1940 or at 1-866-437-1940 (toll free).

VictimLINK 1-800-563-0808 (toll-free), 24 hour-a-day, seven day-a-week support and referral service.

BC Centre for Elder Advocacy and Support

https://www2.gov.bc.ca/assets/gov/people/seniors/health-safety/eap-kits/responding-to-elder-abuse_brochure_jan21.pdf

Public Guardian & Trustee of BC

<https://www.trustee.bc.ca/news-and-information/Pages/resources-and-links.aspx>

Responding to Elder Abuse & Neglect

<https://seniorsfirstbc.ca/for-professionals/responding-elder-abuse-neglect/>