GERIATRIC TRAUMA

PATIENTS >65yrs REPRESENT 10-14% OF ALL VICTIMS, BUT THEY ACCOUNT FOR ~30% OF TRAUMA-RELATED HEALTH CARE DOLLARS!

EPIDEMIOLOGY:

- Most common cause of trauma in elders
  - Falls
  - MVA
  - Pedestrian vs car
  - Assaults

Descending frequency

- Falls:
  - Account for 40% of cases
  - Risk factors are multiple --> meds, cognitive/visual impairment, CVA, arthritis
  - 25% occur as a result of medical problem --> syncope, CVA, hypovolaemia
  - Fractures occur in 5-10% victims
  - **Up to 10% may be seriously injured**
  - If on anticoagulants --> up to 16% have trauma-related abnormalities on head CT (1 in 50 requiring neurosurgery)
- MVA:
  - Older drivers are more likely to be killed or hospitalized because of an MVA
  - Single vehicle crash should raise suspicion of medical cause
- Pedestrian vs car:
  - Highest fatality rate

PRINCIPLES OF DISEASE:

- ALTERED PHYSIOLOGY AND PATHOPHYSIOLOGY ARE KEY CONSIDERATIONS
  - These affect mechanisms of trauma, injury patterns, approach to resuscitation and prognosis
  - More severe injury response, with exacerbation of underlying medical problems is common
- CARDIOVASCULAR SYSTEM:
  - Reserve decreases with age
  - Response to hypovolaemia is ↑'d SVR rather than ↑HR
  - Less response to circulating catecholamines released in response to shock --> HENCE EARLIER DECOMPENSATION
  - Medications (CCB, β-blockers, digoxin) affect capacity to mount a tachycardia in response to shock
  - Higher rates of CAD ↑'s risk of ischaemia in response to hypotension
- RESPIRATORY SYSTEM:
  - ↓ PaO2, ↓ FEV1, ↓ vital capacity
  - Lungs less compliant and muscles weaken
  - Chest wall is more brittle/rigid
  - Hence chest wall injuries quickly lead to respiratory failure

- CENTRAL NERVOUS SYSTEM:
    - Dura mater adheres to periosteum of skull --> hence extradurals are more rare than contusions and subdural (large bridging veins, atrophied and hence mobile brain)
- SKELETAL SYSTEM:
    - Osteoporosis is common, leading to higher fracture rates after minor trauma
    - Spinal stenosis raises rates of cord injury, even without fracture
- SKIN:
    - Skin thins with age, making it more susceptible to traumatic injury
    - Difficult to repair and may require debridement of devitalized tissue

SPECIFIC DISORDERS AND INJURIES OF ELDER PATIENTS:

SPINAL INJURIES:

- Predisposed to injuries of both spinal column and spinal cord
- Osteoporosis and degenerative joint disease (DJD) makes bones more likely to fracture
- Spinal stenosis ↑'s risk of SCI due to cord contusion (even without fracture)
    - Most commonly after hyperextension and leads to *central cord syndrome* (upper limbs > lower limbs with sensory deficit predominating)
- Because of relative immobility of cervical spine due to DJD, most common level of injury is C1-C3
    - Most common fracture is type II odontoid

HEAD INJURIES:

- MOST COMMON CAUSE OF MORTALITY DIRECTLY RELATED TO TRAUMA IN ELDER PATIENTS
- Extradurals rare due to dural adherence
    - Contusions and SDH much more common
- Mortality from head injury is double that of younger patients (with SDH, mortality 4 times higher!)

CHEST INJURIES:

- Rigidity of chest wall related to DJD and osteoporosis make chest wall injuries more common in elders
- Rib fractures are the most common injury
    - Very serious due to ↓'d reserve --> respiratory failure ensues
    - High frequency of atelectasis, pneumonia and ARDS
- With meticulous care, up to 90% may regain full function

ABDOMINAL INJURIES:

- **MORTALITY MUCH HIGHER** (4-5X compared with younger patients)
- Abdominal exam unreliable

EXTREMITY INJURIES:

- Musculoskeletal system is the MOST COMMONLY INJURED ORGAN SYSTEM IN ELDER PATIENTS
- Rarely life-threatening, but impact significantly on ADLs
- Upper extremity:
    - Distal radius # most common
        - followed by proximal humerus, then elbow injuries
- Lower extremities:
    - Pelvic fractures account for 25%
        - If pubic rami --> analgesia and physio alone
        - If open book --> 80% mortality
    - Hip fractures are the most frequent lower extremity fracture and the most common cause of admission for elder trauma patients
        - Early mortality rate of 5%
        - Risk of death 13-30% in first year after the injury

SOFT TISSUE INJURIES:

- Skin fragility makes these injuries both more common and more difficult to manage (debridement often required)
- Many elder patients are not up to date with Tetanus --> consider both active and passive immunization

BURNS:

- Particularly devastating --> Higher rates of mortality
- Because of solo living and decreased reaction times, deeper and more extensive burns may occur in this age group

DIAGNOSTIC STRATEGIES:

- LAB evaluation relates to common sense
- Radiology considerations:
    - Plain films of C-spine difficult to interpret because of baseline degeneration, hence *higher need for CT*

MANAGEMENT:

- AIRWAY/BREATHING:
    - Supplemental oxygen to all as pulmonary insufficiency may develop rapidly
    - Airway management may be particularly difficult
        - ↓'d mouth opening/neck movement make intubation more difficult
        - Edentulous patients difficult to ventilate
- CIRCULATION:
    - Normotension in the normally hypertensive patient may be a subtle sign of haemorrhage. Hypotension is OMINOUS
    - Fluid and blood resuscitation is difficult as underlying CHF may be exacerbated by aggressive circulatory resuscitation
    - Elder patients who go to OT before haemodynamic stabilization have extremely high mortality rates
- LOWER YOUR THRESHOLD FOR ADMISSION