

Geriatric Trauma

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Who should be a trauma team activation?

- 92 year old woman is found down at the bottom of the stairs. She has a GCS of 14 and is somewhat amnestic to the event. Her arms are covered with bruises of various ages. She tells you to leave her alone and go bother some one else.

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- 76 year old male falls out of his tractor during harvest. No LOC. Says his left chest hurts but he is breathing fine. He also tells you to leave him alone because he has to get his work done.

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Objectives

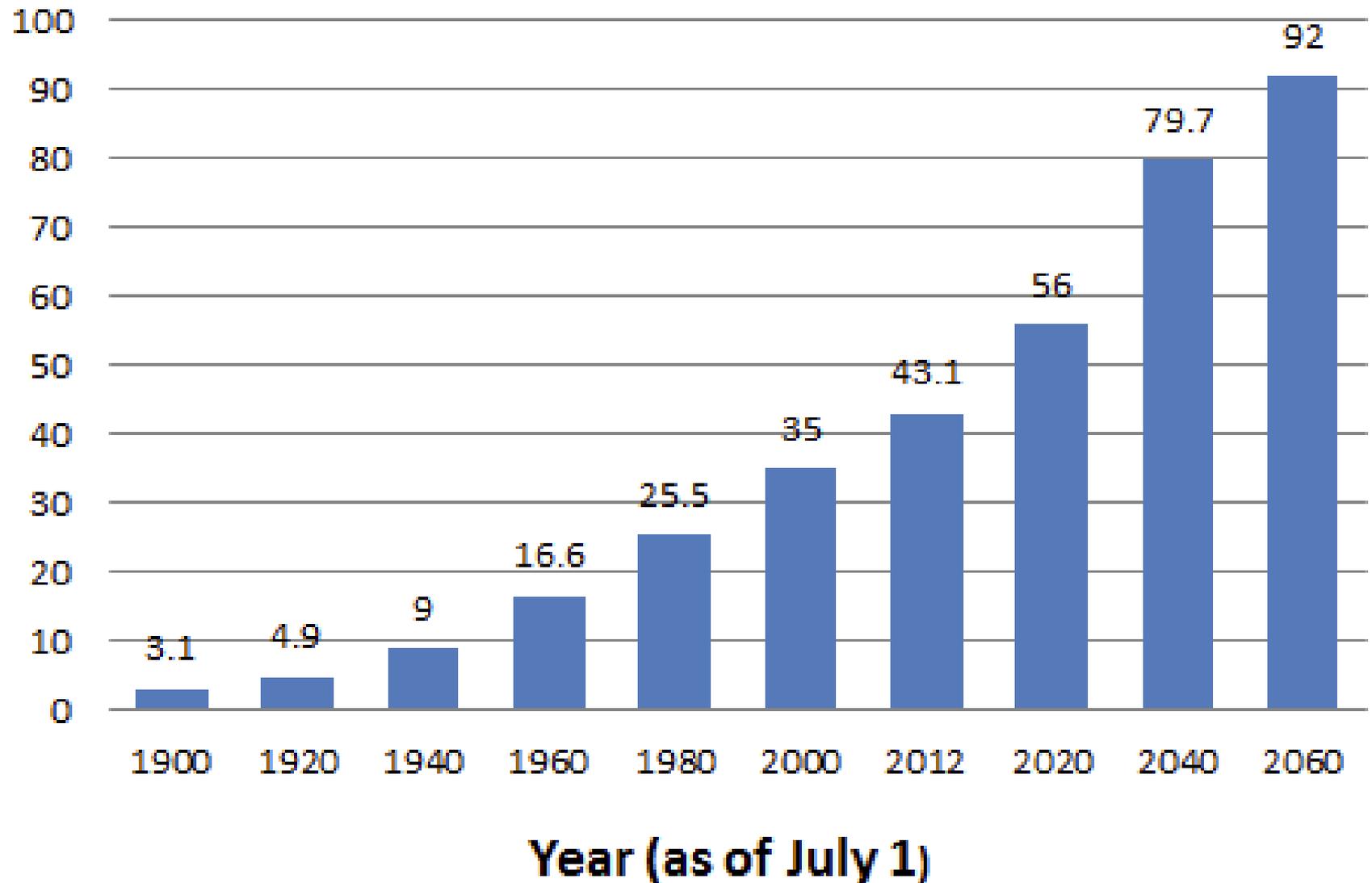
- Review the data surrounding geriatric trauma
- Review the unique aspects of the types of geriatric trauma
- Identify communication issues with an elderly trauma patient
- Discuss physiological differences of geriatric trauma patients
- Discuss the anticoagulants and anti platelets agents relative to the geriatric trauma patient
- Assess how well we do with the triage of the geriatric trauma patient



Data

- The older population
 - 2012 data
 - 65 year or older – 43.1 million
 - 13.7% of U.S. population (1 in every 7)
 - Americans age 45 – 64 increased by 24% between 2002 and 2012
- Message – the elderly will be making up more and more of the trauma population

**Figure 1: Number of Persons 65+,
1900 to 2060** (numbers in millions)



Data

- What is geriatric?
 - Age - 55? 65? 70? 80?
- EAST guidelines
 - For all ISS and body region injured
 - Age 45 – 55
 - Sharp increase in mortality
 - Age 75
 - Doubled mortality

Data

- 10 – 14 % of all traumas victims are > 65
- 33% of all trauma care costs are spent on elderly patients
- Trauma care costs 3 times as much for an elderly person compared to a younger person

Issues with Elder Trauma

- Increased morbidity and mortality across all injuries
- They are old – why try?
 - Many will return to pre-injury status with appropriate management
- Functional status becomes critical outcome measure

Decline in Function with Age

Decreased brain mass →

Eye disease →

- **Decreased depth of perception**
- **Decreased discrimination of colors**
- **Decreased pupillary response**

Decreased respiratory vital capacity →

Decreased renal function →

2- to 3-inch loss in height

Impaired blood flow to lower leg(s)

Degeneration of the joints →

Decreased total body water

Nerve damage (peripheral Neuropathy)



Decline in Function with Age



- Diminished hearing**
- ↓ Sense of smell and taste**
- ↓ Saliva production**
- ↓ Esophageal activity**
- ↓ Cardiac stroke volume and rate**
- Heart disease and high blood pressure**
- ↓ Gastric secretions**
- ↓ Number of body cells**
- ↓ Elasticity of skin, thinning of epidermis**
- 15 – 30% body fat**

Forms of Trauma

- Falls
- Motor vehicle crashes
- Auto vs Pedestrian
- Suicide
- Burns
 - Oxygen use and smoking
- Assaults (elder abuse)

Falls

- 1 in 3 adults age 65 and older will fall each year
- Leading cause of injury deaths
- Most common cause of non-fatal injuries
- \$30 billion – direct medical cost of falls (2010)
- Most common height – ground level



Falls

- Men are more likely than women to die from falls.
- Death rate 30 – 35% higher for men compared to women
- People age 75 and older are 4-5x more likely than those age 65 to 74 to be admitted to long term care facility

Falls

- 25% due to underlying medical problem
- Determine cause of fall
 - May be more important
 - Syncope/near-syncope
 - AAA
 - CVA
 - Hypovolemia (AAA, GIB, dehydration)
 - Medication
 - Elder abuse
 - Alcohol ingestion

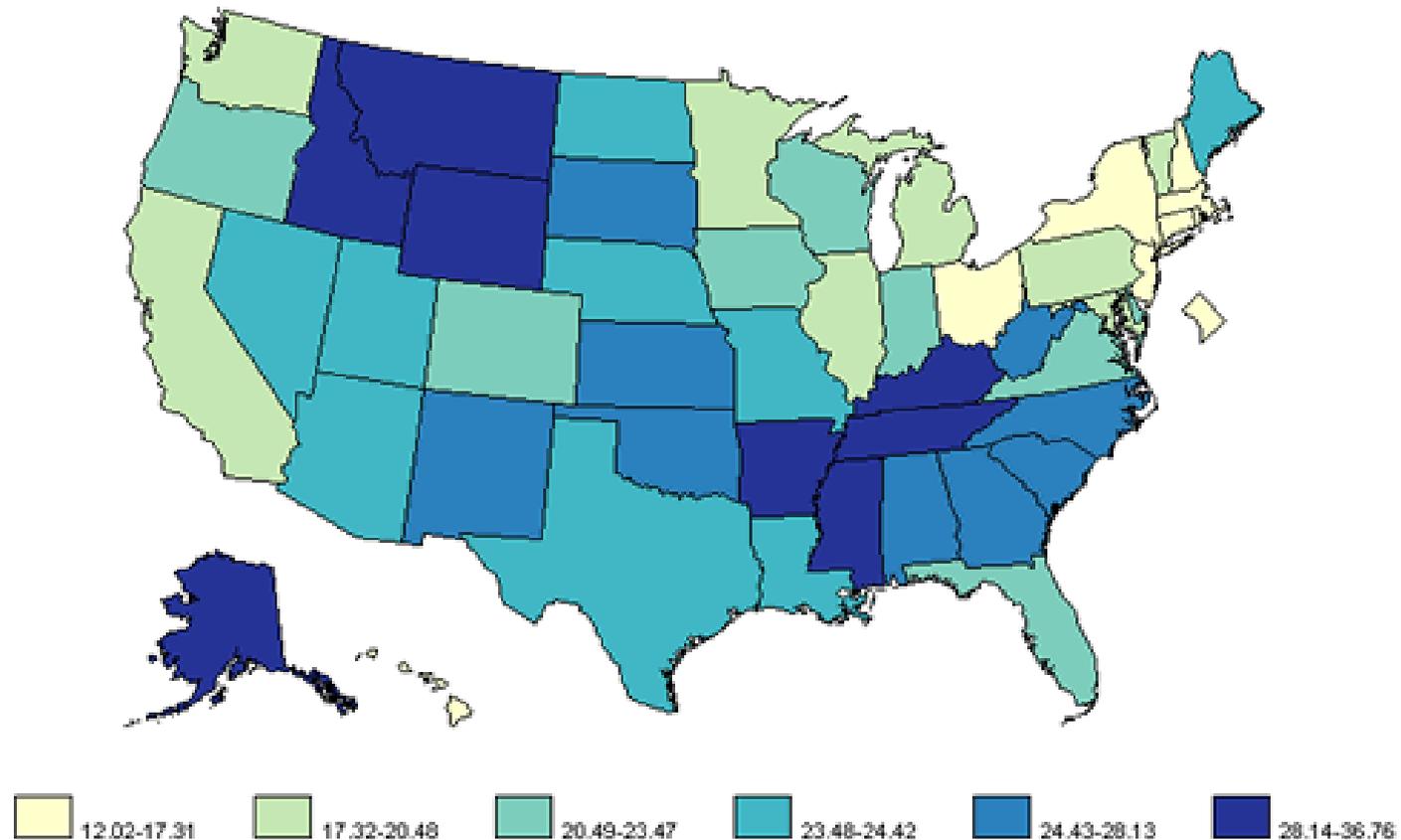
Motor Vehicle Crashes

- 33 million licensed older drivers in 2009
 - 23% increase compared to 1999
- Factors
 - Vision decline
 - Cognitive function
 - Physical changes
 - Medications

2000-2006, United States

Death Rates per 100,000 Population

Motor Vehicle, Overall, Unintentional, All Races, All Ethnicities, Both Sexes, Ages 65-85+ Years
Annualized Crude Rate for United States: 20.74



Reports for All Ages include those of unknown age.

* Rates based on 20 or fewer deaths may be unstable. States with these rates are cross-hatched in the map (see legend above). Such rates have an asterisk.

Produced by: Office of Statistics & Programming, National Center for Injury Prevention & Control, CDC

Data Sources: NCHS National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.

Motor Vehicle Crashes

- Approximately 30% of all trauma in the elderly
- Fatality rate – 21%

Auto vs. Pedestrian

- 9-25% of trauma cases
- Fatality rate
 - 30-55%
 - Most common lethal mechanism



Suicide

- Older citizens make up 12% of population but account for 18% of all suicide deaths
- Suicides may be underreported by up to 40%
 - Overdose, self-starvation or “accidents”
- Murder – suicide situations

Burns

- Decreased awareness
- Medications
- Oxygen and smoking



Abuse

- External signs
- Sudden changes in financial situation
- Belittling, threats and other uses of power by spouses
- Bedsores, unattended medical needs, poor hygiene and unusual weight loss



The Interview

- What happened?
- How are you doing?
- What medication do you take?
- Do you want to go to the hospital?

Communication Issues

- What can be some barriers?
 - Impaired or loss of vision
 - Macular degeneration
 - Impaired or loss of hearing
 - Lower sensitivity to touch

Communication Issues

- Talk directly to the patient
 - Face the patient when speaking
 - Be patient for responses in high stress situations
- Stay in middle of field of vision
- Avoid terms like
 - *Sweetie*
 - *Hon*
 - *Dear*
 - *Pops*

Good Communication

- Family
 - Try to get the story from the patient
- Use family members or neighbors as available or needed
- Obtain a sense of truth in the story
- Sense of abuse or neglect

Medications

- What to ask about?
 - Anticoagulation
 - Beta blockers
 - Pain medication
 - Sedatives



“I don’t want to bother anyone”

- Minor injuries → Major injuries
- May have to probe for significant complaints or symptoms
- Chief complaint may be trivial or non specific
- Patient may not volunteer information
- Why might they not want to go?
 - Financial loss
 - Nursing home
 - Care of spouse

Physiology

- ABC's of the trauma patient assessment
- How are these “primary survey” elements different in the elderly trauma patient?

A - airway

- Priorities are the same
- Decreased cardiopulmonary reserve may require early intubation
- Airway adventures
 - Dentition or lack of
 - Fragile nasopharyngeal mucosa
 - Anticoagulants
 - Cervical arthritis



B - breathing

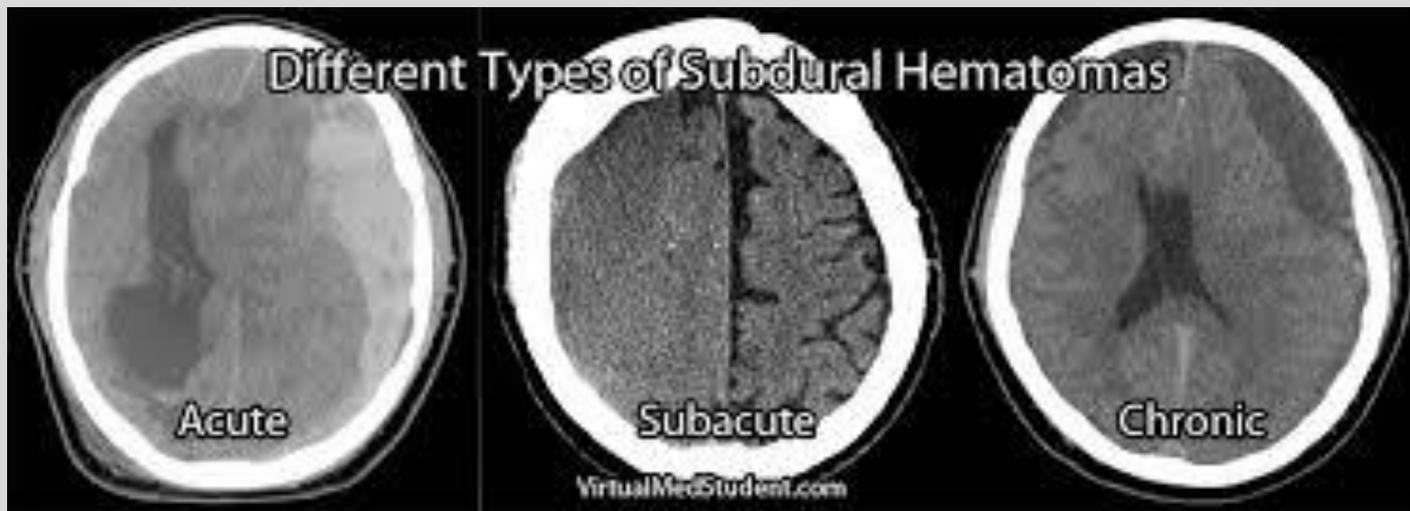
- Chest wall and lungs not as compliant
- Respiratory muscles are weaker
 - Fatigue early and quicker
- Loss of alveolar surface area leads to impaired gas exchange
- COPD
- Chest injuries poorly tolerated
 - Rib fractures at least double mortality

C - circulation

- “Stiff” hearts
 - Myocardial cells replaced by fatty infiltration and amyloid deposits
- Decreased Beta receptors and sensitivity to catecholamines (decreases rate and contractile force)
- Beta blockers
- Pacemakers

Neurologic issues

- Acute and chronic subdural hematomas



- Altered sensorium secondary to cerebral atrophy, hypoperfusion and medications

Neurologic problems

- Spinal osteoarthritis – leading to frequent spinal column and cord injuries



Musculoskeletal Issues

- Most frequent cause of morbidity
- High cervical fracture (C1 and C2) more common in the elderly and can occur with minimal mechanism
 - Treatment options for high cervical injuries
 - Halo vs surgery vs collar
- Osteoporosis

Musculoskeletal Issues

- Preexisting deformities complicate evaluation



- Immobility complicates rehab



Care Issues

- Kyphosis
- Skin integrity



Care Issues

- Spine immobilization
- Splinting



Medications

- Coumadin (warfarin)
- Plavix (clopidogrel)
- Aggranox (ASA/dipyridamole)
- Xarelto (rivaroxaban)
- Arixtra (fondaparinux)

Coumadin

- Vitamin K
- Four factor prothrombin complex concentrates (PCC)
 - Rapid reversal of vitamin K antagonists
 - Plasma derived products
 - Kcentra, CSL Behring
 - Expensive (single dose of Kcentra for 80 kg patient - \$5,080)
 - Effects can wear off
- Fresh frozen plasma

Plavix (clopidogrel)

- Inhibits function of ADP associated with platelet activation
- Most literature associated with ICH
 - Platelets transfusion
 - Desmopressin (DDAVP; promotes VWF as well as Factor VIII)
 - Some discussion of steroids
- No great answer

Aggrenox (aspirin/dipyridamole)

- Inhibits platelet aggregation
- Reversal
 - Not much for anti coagulation effects
 - Consider platelet transfusion

Xarelto (rivaroxaban)

- Selective inhibitor of Factor Xa
- No direct effect on platelet aggregation
- Indirectly inhibits platelet aggregation induced by thrombin
- Half life – 11-13 hours in the elderly
- Affects global coagulation tests (PT & aPTT)
 - PT may be most useful
 - Measurement of anti-Factor Xa levels (difficult)
- No specific reversal agents
 - Consider FFP and PCC
 - Hematology consultation

Arixtra (fondaparinux)

- Half life: 17-21 hours
- Labs: Anti-factor Xa
- Reversal
 - Factor VIIa (limited evidence of effectiveness)

Prevention

- Falls
 - Exercise regularly
 - Review medications
 - Vision assessments
 - Home safety
- MVC
 - Involvement of PCP and family
 - Time and location of driving
 - Seatbelts

Under Triage

- Growing trend toward under triaging the elderly patient
- Physiologic status and underlying comorbidities
- No referral to trauma center
- No trauma activation

Under Triage

- *JACS 2013* - Stanford University study
 - 6,015 patients
 - Age 55 and older
 - Called 911 and admitted to hospital
 - Records reviewed
 - Mortality rates
 - Trauma center – 5.7%
 - Nontrauma center – 9%
 - 32.8% met criteria for referral to trauma center (ISS > 15)
 - Less procedures performed at nontrauma centers
 - 1 day less in the trauma center

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Who should be a trauma team activation?

- Case 1 (Fall and bruises)?
- Case 2 (Fall and chest pain)?
- Case 3 (MVC, abdominal pain and perfect ticker)?

Conclusion

- Trauma in the elderly present a complex mixture of issues
- They are involved in several types of trauma
- Underlying physiology can play a significant role
- Chronic medical conditions and medications may influence care
- Elderly patients are being under triaged at a increasing rate

Questions ?



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