



GERIATRIC TRAUMA

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OBJECTIVES

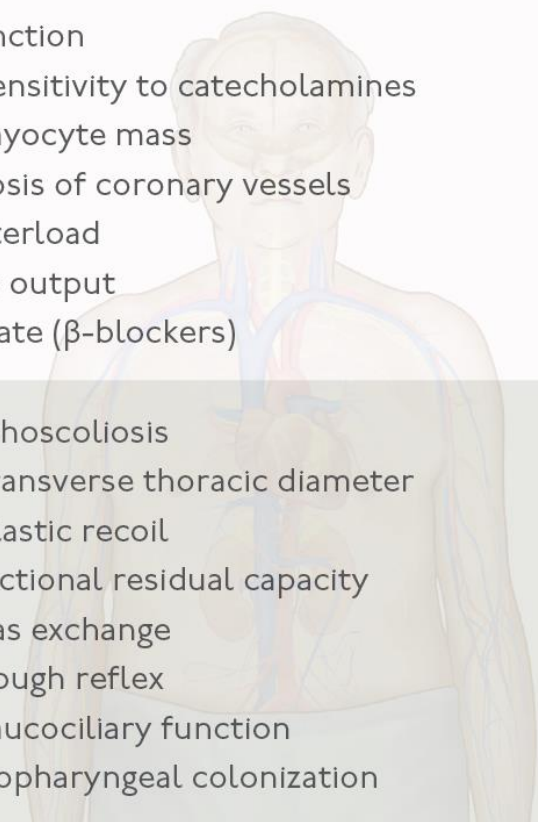
- 1. physiological changes
- 2. mechanisms of injury
- 3. primary survey, resuscitation, management of critical injuries
- 4. unique features of specific types of injury
 - (rib fractures, traumatic brain injury, pelvic fractures)
- 5. common causes and signs of elder maltreatment,

INTRODUCTION

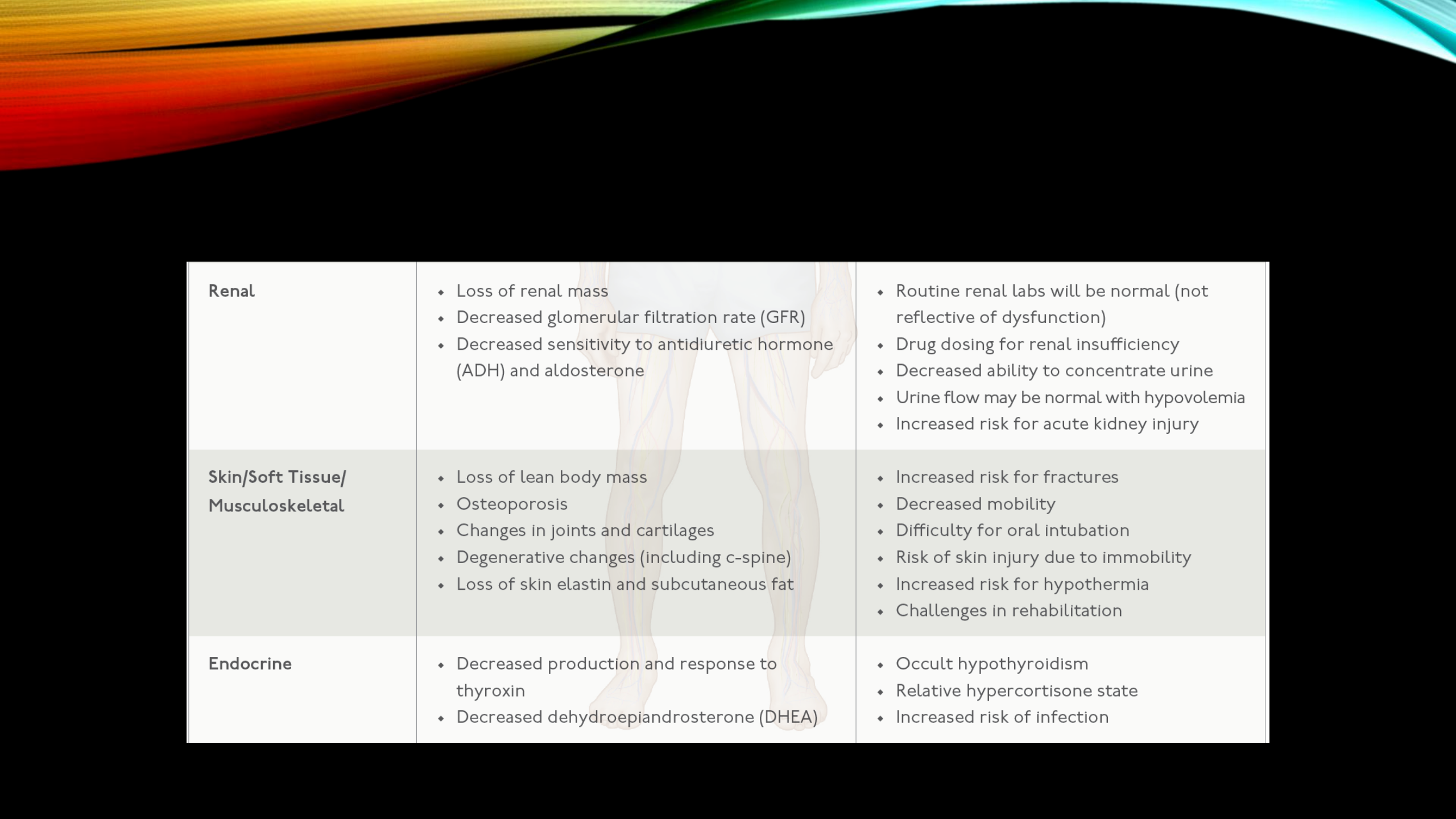
- growth in the proportion of older people
- increased mortality
- failure to triage
- Senescence organ systems (anatomically and physiologically)
- preexisting disease
- Frailty
- Depression
- Substance abuse
- maltreatment

EFFECTS OF AGING AND IMPACT OF PREEXISTING CONDITIONS

- decreased physiologic reserve
- cirrhosis, coagulopathy, chronic obstructive pulmonary disease (COPD), ischemic heart disease, diabetes mellitus



Cardiac	<ul style="list-style-type: none">◆ Declining function◆ Decreased sensitivity to catecholamines◆ Decreased myocyte mass◆ Atherosclerosis of coronary vessels◆ Increased afterload◆ Fixed cardiac output◆ Fixed heart rate (β-blockers)	<ul style="list-style-type: none">◆ Lack of “classic” response to hypovolemia◆ Risk for cardiac ischemia◆ Increased risk of dysrhythmias◆ Elevated baseline blood pressure
Pulmonary	<ul style="list-style-type: none">◆ Thoracic kyphoscoliosis◆ Decreased transverse thoracic diameter◆ Decreased elastic recoil◆ Reduced functional residual capacity◆ Decreased gas exchange◆ Decreased cough reflex◆ Decreased mucociliary function◆ Increased oropharyngeal colonization	<ul style="list-style-type: none">◆ Increased risk for respiratory failure◆ Increased risk for pneumonia◆ Poor tolerance to rib fractures



Renal	<ul style="list-style-type: none">◆ Loss of renal mass◆ Decreased glomerular filtration rate (GFR)◆ Decreased sensitivity to antidiuretic hormone (ADH) and aldosterone	<ul style="list-style-type: none">◆ Routine renal labs will be normal (not reflective of dysfunction)◆ Drug dosing for renal insufficiency◆ Decreased ability to concentrate urine◆ Urine flow may be normal with hypovolemia◆ Increased risk for acute kidney injury
Skin/Soft Tissue/ Musculoskeletal	<ul style="list-style-type: none">◆ Loss of lean body mass◆ Osteoporosis◆ Changes in joints and cartilages◆ Degenerative changes (including c-spine)◆ Loss of skin elastin and subcutaneous fat	<ul style="list-style-type: none">◆ Increased risk for fractures◆ Decreased mobility◆ Difficulty for oral intubation◆ Risk of skin injury due to immobility◆ Increased risk for hypothermia◆ Challenges in rehabilitation
Endocrine	<ul style="list-style-type: none">◆ Decreased production and response to thyroxin◆ Decreased dehydroepiandrosterone (DHEA)	<ul style="list-style-type: none">◆ Occult hypothyroidism◆ Relative hypercortisone state◆ Increased risk of infection

MECHANISM OF INJURY

- Falls
- Motor vehicle collisions
- Burns
- Penetrating injuries

PRIMARY SURVEY WITH RESUSCITATION

- Airway
- Breathing
- Circulation
- Disability

AIRWAY

- ◆ Arthritic changes in mouth and cervical spine
- ◆ Macroglossia
- ◆ Decreased protective reflexes

- ◆ Edentulousness
- ◆ Use appropriately sized laryngoscope and tubes.
- ◆ Place gauze between gums and cheek to achieve seal when using bag-mask ventilation.
- ◆ Ensure appropriate dosing of rapid sequence intubation medications.

- Reduce the doses of barbiturates, benzodiazepines, and other sedatives to between 20% and 40%

BREATHING

- ◆ Increased kyphoscoliosis
 - ◆ Decreased functional residual capacity (FRC)
 - ◆ Decreased gas exchange
 - ◆ Decreased cough reflex
 - ◆ Decreased mucociliary clearance from airways
- ◆ Limited respiratory reserve; identify respiratory failure early.
 - ◆ Manage rib fractures expeditiously.
 - ◆ Ensure appropriate application of mechanical ventilation.

CIRCULATION

- ◆ Preexisting cardiac disease or hypertension
- ◆ Lack of a “classic response” to hypovolemia
- ◆ Likelihood of cardiac medications

- ◆ Look for evidence of tissue hypoperfusion.
- ◆ Administer balanced resuscitation and blood transfusion early for obvious shock.
- ◆ Use advanced monitoring as necessary and on a timely basis.

systolic blood pressure of 110 mm Hg to be utilized as threshold for identifying hypotension in adults over 65 years

Use serum markers such as lactate and base deficit to evaluate shock instead of vital signs
Warm crystalloids are first line treatment for shock

DISABILITY

PHYSIOLOGICAL CHANGES WITH AGING

- ◆ Cerebral atrophy
- ◆ Degenerative spine disease
- ◆ Presence of preexisting neurological or psychiatric disease

MANAGEMENT CONSIDERATIONS

- ◆ Liberally use CT imaging to identify brain and spine injuries.
- ◆ Ensure early reversal of anticoagulant and/or antiplatelet therapy.

EXPOSURE

PHYSIOLOGICAL CHANGES WITH AGING

- ◆ Loss of subcutaneous fat
- ◆ Loss of skin elasticity
- ◆ Arthritic skeletal changes
- ◆ Nutritional deficiencies

MANAGEMENT CONSIDERATIONS

- ◆ Perform early evaluation and liberate patients from spine boards and cervical collars as soon as possible.
- ◆ Pad bony prominences when needed.
- ◆ Prevent hypothermia.

SPECIFIC INJURIES

- rib fractures(pain control and pulmonary hygiene)
- traumatic brain injury(Falls are the most common cause of TBI)
- pelvic fractures

MEDICATIONS

- Beta blockers
- Anticoagulation, antiplatelet therapy, direct thrombin inhibitors
- **Rapidly identifying the type of drug and then instituting a reversal agent**

ELDER MALTREATMENT

- ◆ Contusions affecting the inner arms, inner thighs, palms, soles, scalp, ear (pinna), mastoid area, buttocks
- ◆ Multiple and clustered contusions
- ◆ Abrasions to the axillary area (from restraints) or the wrist and ankles (from ligatures)
- ◆ Nasal bridge and temple injury (from being struck while wearing eyeglasses)
- ◆ Periorbital ecchymoses
- ◆ Oral injury
- ◆ Unusual alopecia pattern
- ◆ Untreated pressure injuries or ulcers in non-lumbosacral areas
- ◆ Untreated fractures
- ◆ Fractures not involving the hip, humerus, or vertebra
- ◆ Injuries in various stages of evolution
- ◆ Injuries to the eyes or nose
- ◆ Contact burns and scalds
- ◆ Scalp hemorrhage or hematoma



REFERENCES:

ATLS 10th edition

ROSEN'S Emergency Medicine 2018