



Special patient population:

# Elderly

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NWC EMS System

Remember any policy you create you must follow!




Turn to SOP p. 8

ELDERLY PATIENTS (65 and older)	
<p><b>Key points:</b> The number one challenge for EMS is recognizing that patients are very fragile.</p> <ul style="list-style-type: none"> <li>• Don't do too much or pump too fast to avoid hypotension. Consider signs/symptoms of different levels of hypotension.</li> <li>• Assessment should be focused on the vital signs. If vital signs are abnormal, do not delay transport.</li> <li>• There is no use of transport for patients to be treated unless you are sure they will require transport.</li> <li>• Advise the patient to be transported to the hospital to receive the care they need.</li> <li>• Pre-existing conditions always impact ability to compensate for Shock and other conditions.</li> <li>• If a patient is not able to be transported, provide the best care you can until they are able to be transported.</li> <li>• Provide appropriate care to the patient until they can be transported to the hospital.</li> </ul>	<ol style="list-style-type: none"> <li>1. <b>ABCDE Special considerations:</b> Rapid airway control with manual ventilatory support.             <ul style="list-style-type: none"> <li>• Use PEEP, avoid suction if available. Prior prepositioned portable humidifier to humidify.</li> <li>• Pulmonary system: Prior to ventilatory failure (1) Lung compliance, (2) ability to breathe deeply, and (3) OCR.</li> <li>• Consider need for PEEP, intubation and/or ventilation w/ PEEP, FiO<sub>2</sub>, and/or NIFV to ventilate.</li> <li>• Clothing organization and transportation status are first and major damage and prevent complications.</li> </ul> </li> <li>2. <b>Head:</b> Brain is fragile. Do not hyperextend. Do not do head tilts. Handle gently. Prior control bleed to ventilations.             <ul style="list-style-type: none"> <li>• Always hyperextend (COPD). Manage ventilatory failure w/ acute rise. advise family.</li> <li>• Assess for signs of stroke, altered mental status, altered LOC, vomiting, or head trauma. Do not move patient until you are sure they are stable.</li> <li>• Assess for signs of stroke, altered mental status, altered LOC, vomiting, or head trauma. Do not move patient until you are sure they are stable.</li> </ul> </li> <li>3. <b>Heart:</b> Pay attention to signs &amp; symptoms of cardiac arrest during transport. Risk of cardiac &amp; respiratory arrest.             <ul style="list-style-type: none"> <li>• Assess for signs of stroke, altered mental status, altered LOC, vomiting, or head trauma. Do not move patient until you are sure they are stable.</li> </ul> </li> <li>4. <b>Assessment:</b> for hearing, visual, cognition, memory, perception, orientation, and vital abilities.             <ul style="list-style-type: none"> <li>• Carefully assess and provide education about patient condition for family.</li> </ul> </li> <li>5. <b>ADL management:</b> Review signs of Fallure. May be more susceptible to adverse effects, e.g. respiratory depression &amp; CO<sub>2</sub> levels. Always use proper technique for moving patient.             <ul style="list-style-type: none"> <li>• All vehicles must have OELAC contact from home prior to receiving patient.</li> </ul> </li> </ol>
<p><b>Physiologic changes in the elderly</b></p> <p><b>Oxidative:</b> Increased consumption of maximum O<sub>2</sub> (maximal VO<sub>2</sub>) during exercise. Cardiac output does not increase (due to a lower heart rate) in response to increased O<sub>2</sub> needs. Compensatory rise in arterial oxygen saturation and stroke volume to maintain "adequate cardiac output" and is a result of a combination of changes.</p> <p><b>Cardiac:</b> A decreased heart rate with stroke volume is approximately 25% compensation. Cardiac output with age 1 to 1.2 L and stroke volume, not from age 1 to stroke volume. Stroke volume and stroke volume may not be the "total response" to metabolic requirements of work. Stroke volume is not the "total response" to metabolic requirements of work. Stroke volume is not the "total response" to metabolic requirements of work.</p> <p><b>Pulmonary:</b> Lung volume and lung compliance, lung elasticity, lung compliance. Residual volume does not decrease with age. Lung compliance, lung elasticity, lung elasticity. Residual volume does not decrease with age. Lung compliance, lung elasticity, lung elasticity.</p> <p><b>Blood:</b> Prior medical conditions, (2) generation alteration rate.</p> <p><b>Neurological:</b> Decreased response to hypoxia, (3) response to hypoxia, (4) poor perception (older people) ability to respond to hypoxia. Check lung.</p>	

Geriatric patient

≥ 65 years  
Baby boomers (born 1/1/46 – 12/31/64) entering retirement

By 2040, this group will make up >20% of US population



Year	Pre-Retirement (48-64 years old)	Retirement (65+ years old)
2002	~100,000,000	~50,000,000
2004	~100,000,000	~50,000,000
2006	~100,000,000	~50,000,000
2008	~100,000,000	~50,000,000
2010	~100,000,000	~50,000,000
2012	~100,000,000	~50,000,000
2014	~100,000,000	~50,000,000
2016	~100,000,000	~50,000,000
2018	~100,000,000	~50,000,000
2020	~100,000,000	~50,000,000

New technologies increase life expectancy, not life span

Need to know unique qualities

May have significant co-morbidities & limited physiologic reserves

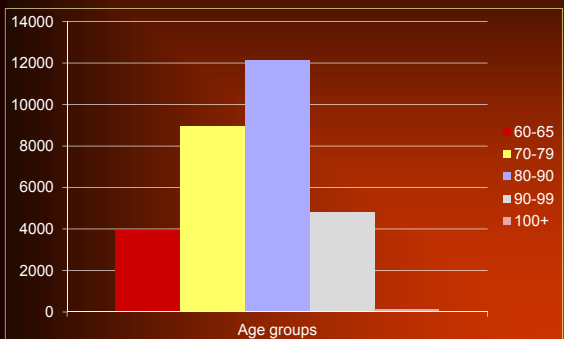
Tailor care to their needs



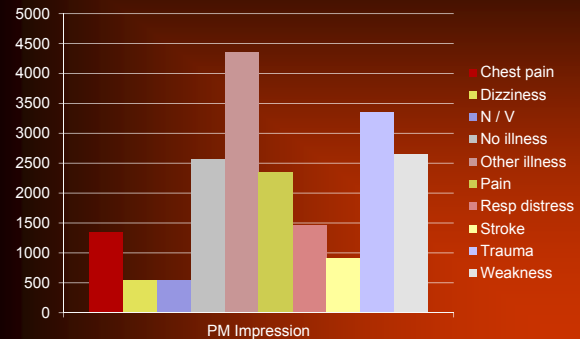
2 X more likely to be transported by EMS  
3 X more likely to be admitted  
2 X as likely to be triaged as critical



So, what elderly age group do we see the most?



What PM impression do we see the most?



*What biases do we bring to caring for the elderly?*

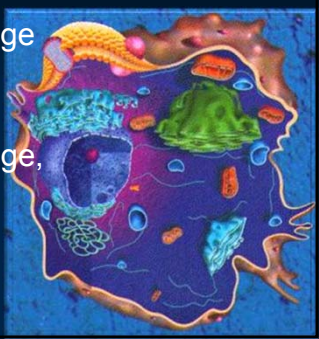
Biology of aging

We age differently at different rates  
Chronological vs biological age



It starts in the cells...

All cells sustain changes as they age  
Normal cells have mechanisms to repair minor damage, but this ability declines with age



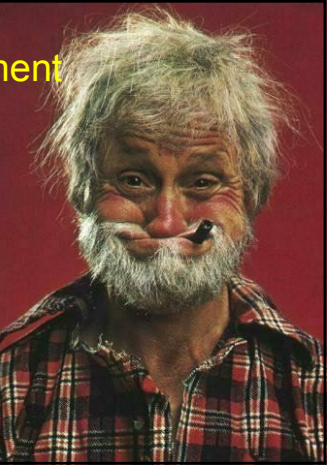
Determinants of aging

Influenced by genetics, disease, cultural, environmental, occupational, socio-economic factors  
Health behaviors: diet, exercise, tobacco, alcohol/drugs, rest, stress, attitudes




**Elderly assessment**

Determine what complaints constitute a medical/trauma emergency, a disease process, or are a normal part of "aging"



**Disease**

Interruption in physiologic function that causes harm to the individual  
Not a natural part of aging



**Normal aging**

Natural loss of function & reserve capacity that occurs as one gets older

- 1% rule over 30
- Cannot tolerate body stress well
- Longer to recover



**Disease assessment**

Which organ system is involved?  
Degree of impairment?  
Threat to:

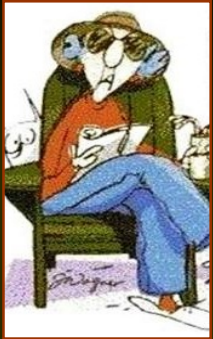
- Life?
- Daily activities?

At what level does this pt usually function?



**Specific age-related changes**

According to Maxine –“the” Change has come...



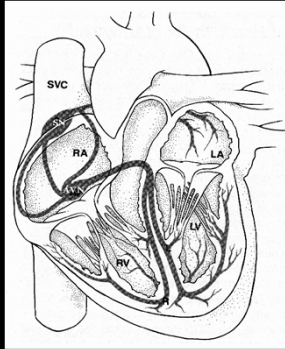
**Cardiovascular system**

Heart disease remains leading cause of death among older adults  
CAD is #1 culprit



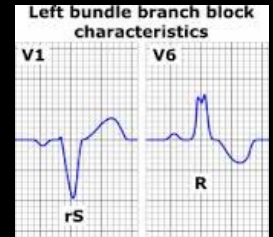
### CV changes: HR & Rhythm

Fewer SA node cells  
 Younger hearts: 50% myocytes  
 Older: 10% myocytes  
 Slower HR  
 Less responsive to ANS stimulation



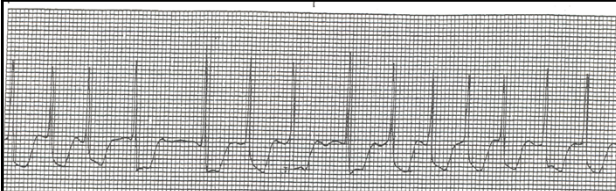
### AV node/BB function changes

Distal LV conduction delay - leftward axis deviation on ECG  
 Left shift accelerated due to HTN or ischemic heart disease  
 Delay can progress to L anterior hemi-block or LBBB  
 RBB usually assoc w/ pulmonary HTN



### Rhythm disturbances

Conduction defects & cardiac dysrhythmias more common, even if no significant CV dx  
 ~1/3 may have AF- Conduction changes in SA node make heart more susceptible to AF



### Hemodynamics

SV & HR reduced after 40 d/t myocardial "stiffening"  
 Diastole impaired as relaxation occurs more slowly  
 Ventricular stiffening + delayed diastole cause underfilling of ventricles (LV)  
 Balancing of supply & demand -  
 ↓ CO + ↓ O<sub>2</sub> demand  
 d/t reduction in lean body mass



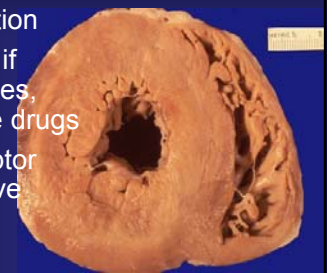
### Hemodynamics cont.

Significant volume loss masked (no tachycardia)  
 Impaired blood flow to lower legs



### Vessel stiffening

Media stiffens; calcifications in arteries  
 ↑ afterload; ↑ SBP; thickening LV wall →  
 Loss of vasoconstriction  
 Postural vertigo esp. if on anti-hypertensives, nitrates, vasoactive drugs  
 Catecholamine receptor sites less responsive



### Cardiovascular changes

#### Valve incompetency



### Caveats in elderly care

- ↑ risk of ACS & pump failure in response to physiologic stress, shock, trauma
- Less responsive to ANS stimulation; impaired baroreceptor response
- Less reflex vasoconstriction or tachycardia
- Meds may limit HR



### CV caveats cont.

- Early/aggressive Rx - treat occult shock, optimize CV functioning to prevent end organ damage
- IVF alone does not always ↑ O<sub>2</sub> delivery
- Inotrope and vasopressor support may be needed to provide perfusion/vasoconstriction
- Hypotension has higher mortality rate - late and unreliable sign of hemorrhage

### CV caveats cont.

- ↑ risk of AMI & stroke d/t atherosclerosis
- Need ↑ perfusion to brain & CA during prolonged or severe hypotension
- Elderly w/ trauma & HR >90 or SBP < 110 candidate for trauma center



### Pulmonary changes

- Most respiratory parameters ↓ with age
- Thoracic cage stiffens; rigidity leads to ↓ lung compliance
- ↑ WOB
- Reduced flexibility major concern in chest trauma d/t ↑ risk of rib fx




### Exaggerated curvature of spine: kyphosis




### Pulmonary changes

- Less respiratory muscle strength
- ↑ O<sub>2</sub> demands, ↑ WOB dramatically
- Diaphragm flatter; inhalation less complete & weaker due to shape
- ↓ Respiratory reserve  
Limits compensation




### Pulmonary changes

- ↑ dead space; ↓ ciliary activity = infections
- Lungs lose inward elastic recoil
- Diffusion deficiencies; V/Q mismatch  
4 mmHg/decade d/t closure of small airways
- ↓ PaO<sub>2</sub> (SpO<sub>2</sub>)
- No changes to EtCO<sub>2</sub>
- ↑ rate, ↓ depth



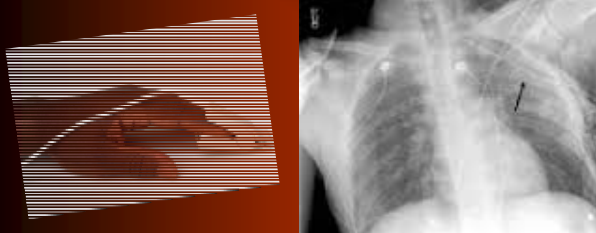
### Pulmonary vulnerability

- Cough may be ineffective
- Changes in thorax & pulmonary function  
↓ ability to resist infections & compensate for injury
- Response to hypoxia, hypercarbia, & acidosis blunted



### Caveats: Pulmonary System

- ↑ WOB more dramatic w/ pulm contusion
- ↑ risk for rib fractures
- More prone to ventilatory failure (✓ EtCO<sub>2</sub>)




### GI changes

- ↓ gastric acid production  
Difficulty with digestion
- ↓ Intestinal motility
- ↓ Saliva  
Difficulty chewing & swallowing



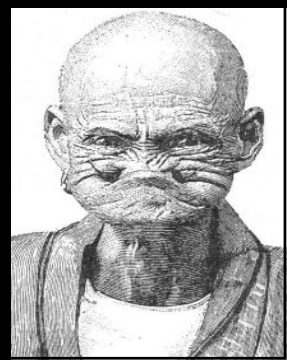
### GI changes

- ↓ Thirst sensation  
Dehydration
- ↓ Taste buds
- Gum atrophy
- ↓ Liver size & function



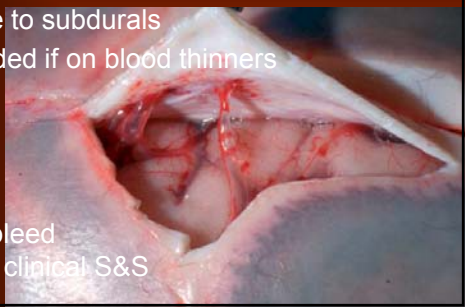
### Net effects on GI System

- Difficulty with digestion
- Feel full early
- Dry mouth
- ↓ appetite, enjoyment
- Tooth loss
- Risk of toxicity (drugs, alcohol)
- Diminished clotting



### Brain changes

- Dura connected to skull
- Brain degeneration stretches bridging veins
- Vulnerable to subdurals
- Compounded if on blood thinners



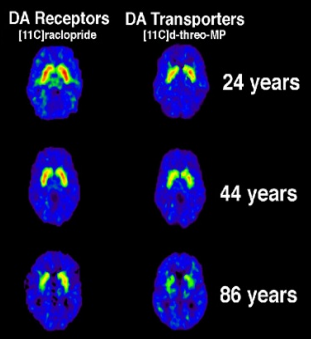
Space to bleed  
Delayed clinical S&S

### What do you think?

85 y/o woman in a collision  
 No seat belt; thrown into windshield  
 No loss of consciousness; mild bruising; not hospitalized  
 1 month later; family notice changed behavior; fluctuating confusion, tends to drag L foot  
 Alert, oriented to person; misses dates, normal language, mild drooping of L lower face  
 Mild weakness L leg

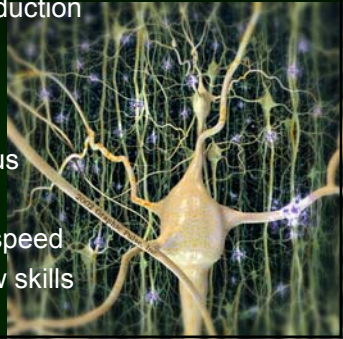
### CNS changes

- ↓ cortical cell count
- Language comprehension
- Word retrieval
- ↓ complex learning



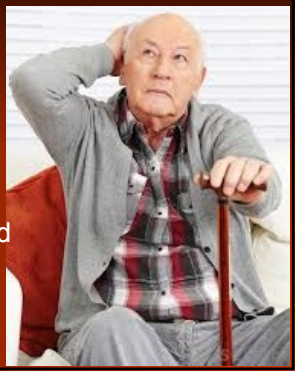
### Cognition changes

- Prolonged nerve conduction velocity
- ↓ attention
- ↓ vigilance
- ↓ ability to shift focus
- ↓ multitasking
- Delayed processing speed
- Difficulty learning new skills



### Memory

- Mildly impaired
- Remote memory tasks remain intact
- Logically unassociated tasks difficult
- At 70-80: Language comprehension & word retrieval deficits occur



**Decreased sense of smell and taste**

**Eyes / Vision**

Vision changes

Smaller pupil size; decreased response

- ↓ depth perception
- ↓ Color discrimination

**Eyes / Vision**

Clouding of lens: Cataracts

Arcus senilis: normal in elderly

**Hearing**

Ossicle degeneration

Atrophy of auditory meatus

Atrophy of cochlear hair cells and auditory neurons

Affects communication

High tones lost 1<sup>st</sup>

**Impacts to mobility**

Skin receptors reduced

Slowed nerve conduction

Changes in touch & vibration; impairs information from muscles & joints

Posture changes

**Parkinson's video**

<http://www.youtube.com/watch?v=IHDFQf mkKlq>



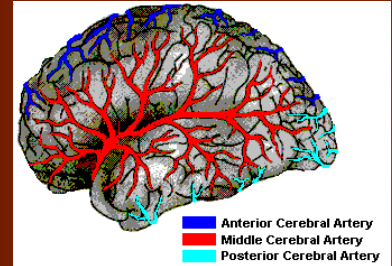
### At risk for hypothermia

- Impaired thermoregulation
- Reduced fat stores
- Slow metabolic rate
- Caution: AMS & AF may suggest hypothermia w/o thermometer



### Cerebrovascular

- Impaired autoregulation
- ↓ Cerebral blood flow
- ↓ CPP



### Be careful...

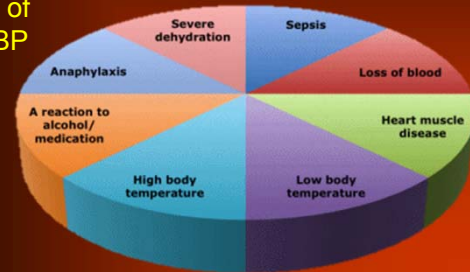
- Don't make false assumptions
- Confusion is not normal
- Look for cause: Drugs; hypothermia; sepsis, hypoxia, hypoglycemia, stroke, trauma, etc...



### Beware hypotension!

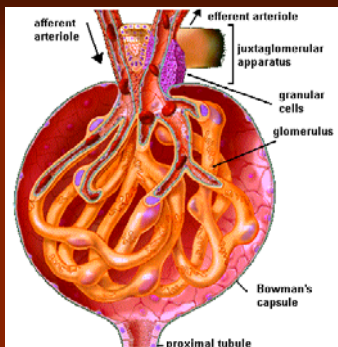
↑ risk of cerebral anoxia/ischemia during hypotension, especially if Hx of HTN

#### Causes of abrupt BP drop



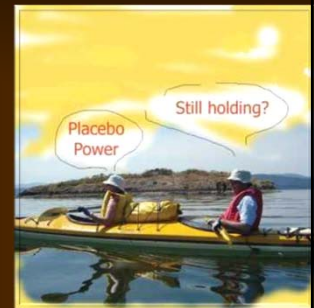
### GU System

- ↓ renal mass
- 1.5% / year decline
- ↓ renal clearance
- ↓ blood flow
- ↓ GFR 1 mL/min/yr



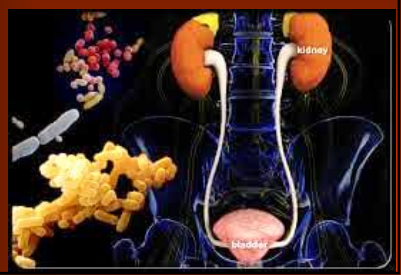
### GU system

- ↓ ability to reabsorb Na and secrete H & K
- ↑ Fluids needed to produce same amount of waste
- ↓ bladder capacity (50%) and control
- ↑ prostate size



### Net effects ~ Renal System

- ↑ Toxicity from drugs
- ↑ Infections – frequent cause of sepsis



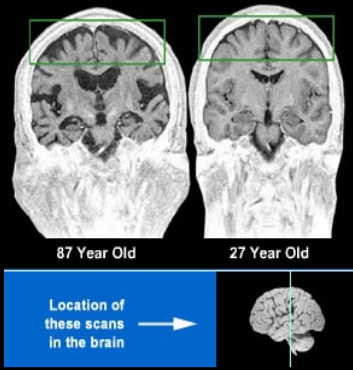
### Body composition

↓ Total body water  
 Body weight is 50% water (or less...) → dehydration



### Body composition

↓ in body cell mass  
 Most organs ↓ in size by 50% by age 70  
 Except lungs, heart and prostate



### Body composition

Fat often increases  
 Fat distribution more central



### Skin changes

- Poor elasticity
  - Wrinkles
  - Poor turgor
- Loss of collagen
  - Wrinkles
  - Thin skin
- Sweat glands shrink  
 Loss of temperature regulation



### Skin changes

- Pigment deposition:
  - Age spots
- Fragile capillaries:
  - Bruising
- Hair follicles atrophy:
  - Balding



### Endocrine

- ↓ thyroid, ovarian, and testicular function
- ↓ Glucose tolerance
- ↑ resistance of insulin receptors



### Net effects ~ endocrine system

- ↓ energy and metabolic rate
- ↓ heat/cold tolerance
- ↓ reproductive function; ED
- Predisposed to hyper or hypoglycemia (T2D)
- Less likely to develop fever



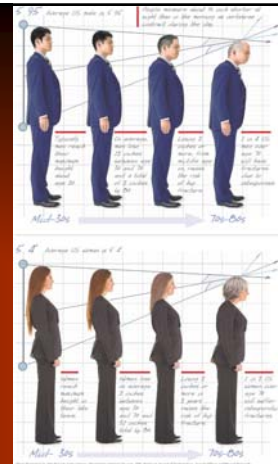
### Musculoskeletal System

- ↓ muscle mass (Sarcopenia)
- Narrowing of intervertebral discs
- Bone demineralization
- ↑ joint tenderness



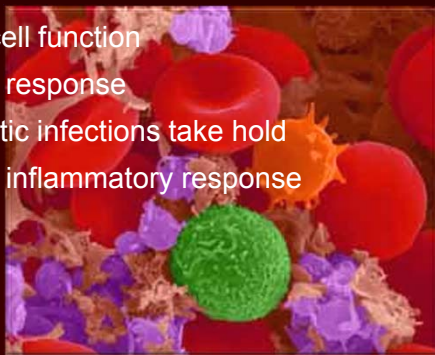
### Net effects

- Loss of strength
- Loss of flexibility
- Loss of bone strength
- Height reduction
- ↑ risk of trauma, falls, fractures
- Change center of gravity



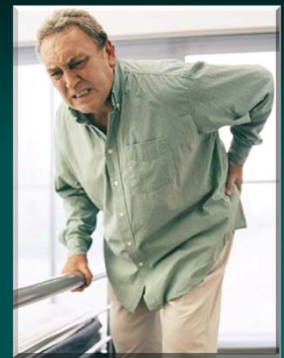
### Immune System

- Loss of T-cell function
- Decreased response
- Opportunistic infections take hold
- Decreased inflammatory response



### Immune system changes

- Infections present differently
- UTIs common
- Sepsis
- Indwelling medical devices increase risk for infection

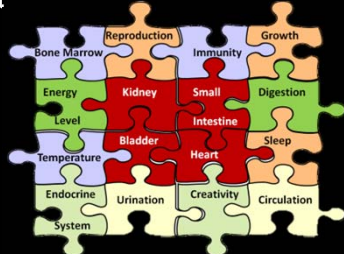


### Functional reductions

Physiologic Measurement	% reduction from age 30 to age 80
Resting CO	30%
Vital capacity	50%
Renal blood flow	50%
Maximum breathing capacity	60%
Maximum O2 uptake	70%

### Interdependence of function

All organ systems need to function in synergy  
 Loss of one results in dysfunction of another  
 PMH very important



Elderly Assessment & Mgt

### Assessment

Assume some functional loss in every organ  
 Assess & reassess; *what you see is not what you get!*

- High index of suspicion for:
- ACS; stroke
  - Hypovolemia/dehydration
  - Acute renal failure; UTI
  - Pneumonia; syncope



### Establish rapport

- Be professional
- Do not use terms of endearment (grandma, honey)
- Use their last name
- Do not be overly familiar - may offend



Establish if patient can see and hear you and whether they can speak  
 Insert their dentures when appropriate



**Effective communication is key**

- Do not raise voices
- Need quiet background
- Minimize distractions
- Clear speech
- Face patient



**Hearing deficits**

- Ask one question at a time
- Use simple language
- Listen to pt – speak into good ear
- Hearing aids



**Hearing accommodation**



**Bring glasses to hospital**



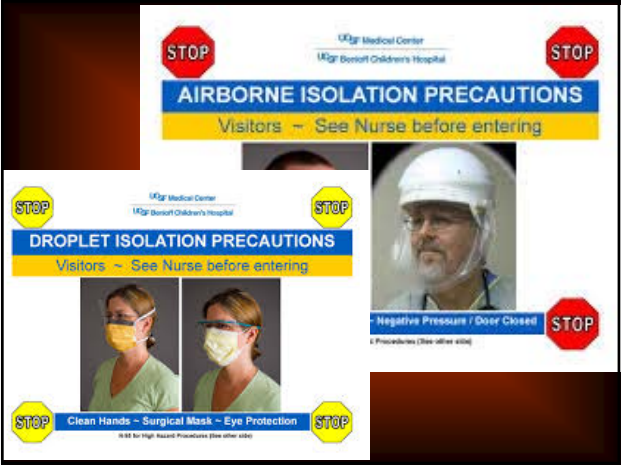
**Communication Principles**

- Clarify what patient is telling you
- Use APPROPRIATE touch
- Reassure with calm / respectful tone of voice
- Do not assume slow answers indicate lower intelligence



**Scene size up**





### COPD

Respiratory failure devastating  
 BVM: Eliminate only excess CO<sub>2</sub> of failure  
 If ET placed and hyperventilated to pCO<sub>2</sub> of 35-40,  
 may suffer lethal dysrhythmias from Ca binding  
 Slowly ↓ PaCO<sub>2</sub> (not more than 5 mmHg/hr)

### IV Fluids

Hypotension dangerous  
 Support CV status  
 May appear "stable" yet have perfusion deficit  
 due to low cardiac output  
 Control bleeding before  
 lg amounts IVF  
 Give fluids if needed  
 Don't volume overload

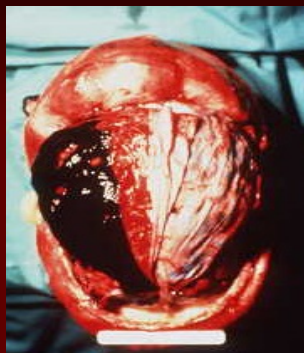


## Neuro assessment

Confusion and AMS  
NOT normal

Causes:

- Stroke, TIA
- IC Bleeding
- Hypoxia
- Hypothermia
- Sepsis, dysrhythmia
- Drugs



Don't assume awake pt is OK



Investigate all restlessness

## Pad well



## Pain assessment

Is pain acute, chronic, or acute on chronic?  
Affecting ADLs?  
Explore severity

Abbey Pain Scale Use to assess pain in people with dementia who cannot verbalize Score each as Absent 0; Mild 1; Moderate 2; Severe 3				Score
Vocalization: Whimpering, moaning, groaning, crying				
Facial expression: Looking tense, frowning, grimacing, looking frightened				
Change in body language: Fidgeting, rocking, guarding part of body, withdrawn				
Behavioral Change: ↑ confusion, combativeness, refusing to eat, alteration in usual patterns, difficulty sleeping, increased wandering, decreased social interactions				
Physiological change: T, P, or BP outside normal limits, perspiring, flushing or pallor				
Physical changes: Skin tears, pressure areas, arthritis, contractures				
0-2 No pain	3-7 Mild	8-13 Moderate	14+ Severe	Total:

## Fentanyl dosing

Elderly (≥ 65) or debilitated: 0.5 mcg/kg (max single dose 50 mcg) IVP/IN/IM/IO.

All additional doses require OLMC: 0.5 mcg/kg q. 5 min up to total of 3 mcg/kg (300 mcg) if indicated

May be more susceptible to SE:  
Resp depression & CV effects  
Monitor EtCO<sub>2</sub> & BP

Age-related kidney impairments  
result in lower clearance rates



## Chief complaint

Good Hx gives right impression 80% of time

Complaints often vague (fatigue/weakness)

PMH usually extensive and confusing due to changes in story or combination of acute and chronic conditions

May deny Hx but be taking meds for it

### Psychological



Depression common

- Loss of physical function
- Loss of family, friends
- Loss of social support

### Polypharmacy



### Polypharmacy

Use of multiple meds concurrently  
 Too many drugs, drugs taken for too long, exceedingly high doses

5 Rx meds/day  
 3 OTC drugs



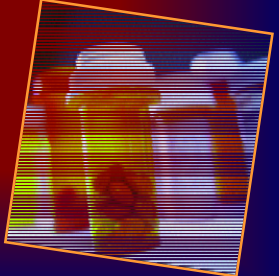
### Risks for polypharmacy

- # and severity of illnesses
- Placement in long term health facilities
- Number of physicians seen
- Number of pharmacies used
- Incorrect self-administration
- Poor vision



### Other factors

- May stop taking meds due to side effects
- Take another's drugs
- OTC medications may interact with Rx






### Prevention

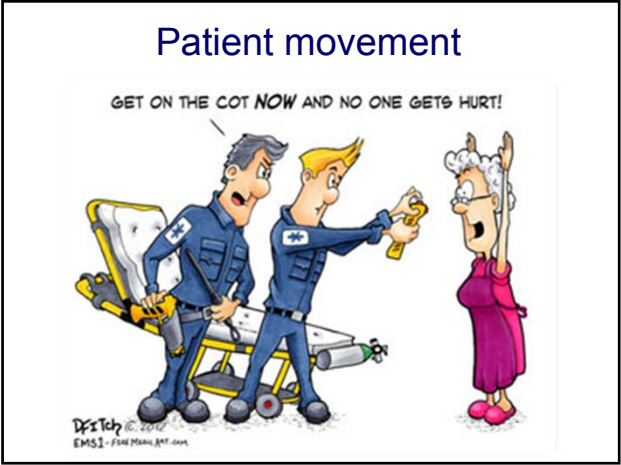
- Coordination between physicians
- Frequent review of meds/ supplements
- Compliance/drug levels
- Behavior/sleep complaints





### Poor med choices for elderly

	Valium
	Phenobarbital
	Amitriptyline



### Concerns

- Transport w/o making current condition worse and no new injuries
- Frail skin, bone density losses
- Ensure comfort
- Use moving devices
- Avoid skin tears & injuries
- Visual check before adjusting cot



### Plan path

### Care for all GU devices

- Maintain closed system
- Make sure tubing is never kinked!!!
  - Autonomic hyper-reflexia
  - Infection
- Make sure drainage bags are below level of bladder
- Don't place bag between patient's legs
- Don't let bag lay on floor



## Patient disposition



Selection of receiving hospital  
All refusals must be called in



## Environmental (risk) assessment if patient is stable

See handout p. 15

**Pair & share** – what have you seen that puts seniors at risk?




### Frailty Score<sup>SM</sup>

Patient receives one point for each criterion (0-5)

Frailty Criteria	Definition																								
Weight loss	Unintentional weight loss ≥10 pounds in the past year.																								
Decreased grip strength (weakness)	Grip strength in the lowest 20th percentile by gender and BMI. Three trials are performed with a hand-held dynamometer and the average value is used. <table border="1" style="width: 100%; margin-top: 5px;"> <thead> <tr> <th colspan="2">Men</th> <th colspan="2">Women</th> </tr> <tr> <th>BMI</th> <th>Kg Force</th> <th>BMI</th> <th>Kg Force</th> </tr> </thead> <tbody> <tr> <td>&lt;24</td> <td>&lt;29</td> <td>&lt;23</td> <td>&lt;17</td> </tr> <tr> <td>24.1-26</td> <td>≤30</td> <td>23.1-26</td> <td>≤17.3</td> </tr> <tr> <td>26.1-28</td> <td>≤30</td> <td>26.1-29</td> <td>≤18</td> </tr> <tr> <td>&gt;28</td> <td>≤32</td> <td>&gt;29</td> <td>≤21</td> </tr> </tbody> </table>	Men		Women		BMI	Kg Force	BMI	Kg Force	<24	<29	<23	<17	24.1-26	≤30	23.1-26	≤17.3	26.1-28	≤30	26.1-29	≤18	>28	≤32	>29	≤21
Men		Women																							
BMI	Kg Force	BMI	Kg Force																						
<24	<29	<23	<17																						
24.1-26	≤30	23.1-26	≤17.3																						
26.1-28	≤30	26.1-29	≤18																						
>28	≤32	>29	≤21																						
Exhaustion	For the following two statements: 1. "I felt that everything I did was an effort." 2. "I could not get going." The patient is asked: "How often in the last week did you feel this way?" 0 = rarely or none of the time (<1 day) 1 = some or a little of the time (1-2 days) 2 = a moderate amount of the time (3-4 days) 3 = most of the time The criterion is met if patient answers 2 or 3 to either statement.																								
Low physical activity	Weekly energy expenditure, determined with the short version of the Minnesota Leisure Time Activities Questionnaire in the lowest 20th percentile by gender. Men: <383 kcal/week. Women: <270 kcal/week.																								
Slowed walking speed	Walking speed in the lowest 20th percentile by gender and height. Time is measured for a distance of 15 feet at normal pace. The average of three trials is used. <table border="1" style="width: 100%; margin-top: 5px;"> <thead> <tr> <th colspan="2">Men</th> <th colspan="2">Women</th> </tr> <tr> <th>Height</th> <th>Time</th> <th>Height</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>≤173 cm</td> <td>≥27 sec</td> <td>≤159 cm</td> <td>≥27 sec</td> </tr> <tr> <td>&gt;173 cm</td> <td>≥6 sec</td> <td>&gt;159 cm</td> <td>≥6 sec</td> </tr> </tbody> </table>	Men		Women		Height	Time	Height	Time	≤173 cm	≥27 sec	≤159 cm	≥27 sec	>173 cm	≥6 sec	>159 cm	≥6 sec								
Men		Women																							
Height	Time	Height	Time																						
≤173 cm	≥27 sec	≤159 cm	≥27 sec																						
>173 cm	≥6 sec	>159 cm	≥6 sec																						

### Assessing Gait and Mobility Impairment and Fall Risk in Ambulatory Patients<sup>10,12</sup>

Timed Up-and-Go Test (TUGT)

Patients should sit in a standard armchair with a line 10 feet in length in front of the chair. They should use standard footwear and walking aids and should not receive any assistance.

Have the patient perform the following commands:

1. Rise from the chair (if possible, without using the armrests)
2. Walk to the line on the floor (10 feet)
3. Turn
4. Return to the chair
5. Sit down again

Interpretation of TUGT

Any person demonstrating difficulty rising from the chair or requiring more than 15 seconds to complete the test is at high risk for falls. Consider preoperative referral to physical therapy for more detailed gait assessment.

Frailty Score: Operational Definition <sup>10</sup>	
Criteria	Definition
Shrinkage	Unintentional weight loss ≥10 pounds in past year
Weakness	Decreased grip strength
Exhaustion	Self-reported poor energy and endurance
Low physical activity	Low weekly energy expenditure
Slowness	Slow walking

Interpretation of the Frailty Score

The patient receives 1 point for each criterion met.

0-1 = Not Frail  
 2-3 = Intermediate Frail (Pre-frail)  
 4-5 = Frail

ACS Trauma Quality Improvement Program (TOIP)

Frail patients are at much higher risk of adverse health outcomes. Intermediate frail patients are at elevated risk (less than frail ones) but are also at more than double the risk of becoming frail over 3 years.

## Case study – p. 26

An 81 y/o female found down on icy parking lot of local supermarket. PMs find elderly woman lying face down between two parked cars. A bystander put her head on a rolled-up sweater. He reports that he saw the woman "shaking and twitching".

Her eyes open when you start talking to her and she is looking around as if very confused and agitated. She initially withdraws her left arm when you touch her hand.

There is a language barrier, she does not remember what happened, her address, or phone number, but is able to communicate that she has had a stroke in the past, has a headache presently (8/10), feels dizzy, and is on Plavix.

*What's the GCS?*

There is a bag of groceries, a purse, and car keys on the ground between the cars. The keys open the car door next to the patient.

**Exam**

Large, tender hematoma just above left ear. She won't let you touch it. Blood present in her hair in that area. No blood or drainage from that ear.

You note a dent on the rear bumper of one of the cars with some hair on it. Hair matches patient's.

Able to follow simple commands

Pupils round, equal, midpoint, and both react to light; Smile is symmetrical and both eyes close tightly

c/o of pain and tenderness to palpation in her midline back near the bottom of the rib cage

Moving extremities X4 but RA has pronator drift (unclear if new or residual from previous stroke).

No reported sensory deficits. Glucose 180.

VS: BP 150/92; P 72 and irregular; R 18; SpO2 98%; EtCO2 35, square waveform, ECG: Atrial fib

What is your primary impression of this patient's condition/injury?

What are the treatment priorities in sequence?

Does she require selective spine motion restriction?

How should that be accomplished?

What role does her age and medical history play in her current condition?

Is this a time-sensitive patient? Why?

Where should she be transported and why?

**Outcome:**


This woman is injured

Apparently, she was able to drive and buy groceries earlier in the day

Neuro status continued to worsen in ED  
Became unresponsive and required ETI

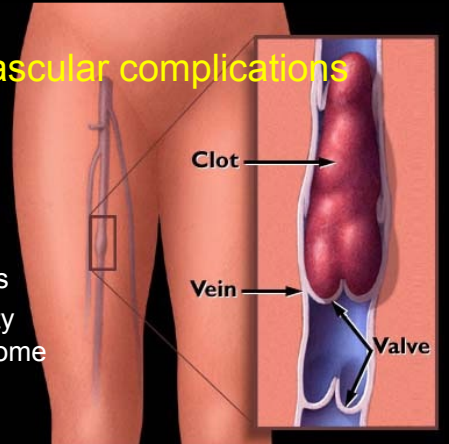
CT scan revealed massive subdural hematoma – EMS (in real case) focused on stroke, did not consider trauma – needed Level I TC

**What factors increase mortality in the elderly?**



- Hypotension
- Blunt trauma
- # of chronic conditions
- # of failing organs
- Intra-abdominal bleeding
- Severe burns; head trauma

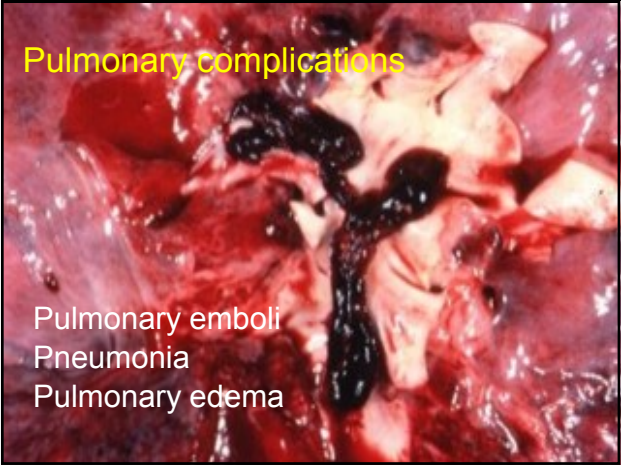
**Cardiovascular complications**



Risk for AMI  
Deep vein thrombosis  
Early mobility reduces some risks

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**Pulmonary complications**



- Pulmonary emboli
- Pneumonia
- Pulmonary edema

**How can these complications be prevented?**

- Hypoxia/hypercarbia
- Fluid and electrolyte imbalances
- Under-resuscitated shock, hypotension, pain
- Nosocomial infections
- Skin tears, pressure sores
- Adverse drug reactions



**Geriatrics can be fun!!!**



Older adults can be interesting  
Simple attention can make them feel better  
They understand that not everything can be cured  
Complex & challenging diagnoses  
More likely to say, "Thank you."

**Medical Emergencies**



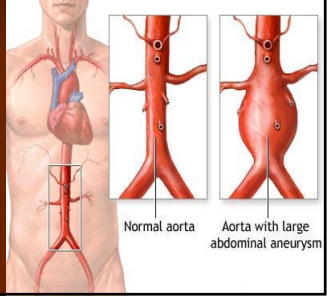
### Acute abdomen



Serious complaint  
Pain may not always be a clue  
Peritonitis may not be evident  
↓ inflammatory response

### Abdominal Aortic Aneurysm

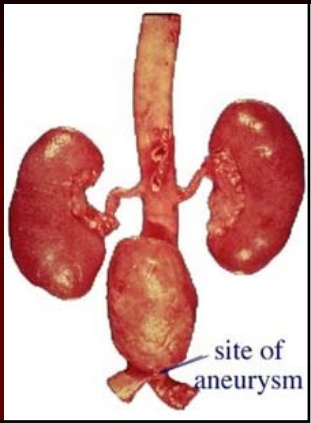
1-4% of population over 50  
Atherosclerosis;  
elastin & collagen loss  
PMH: any cardiac or vascular disorder



Normal aorta      Aorta with large abdominal aneurysm

### Presentation

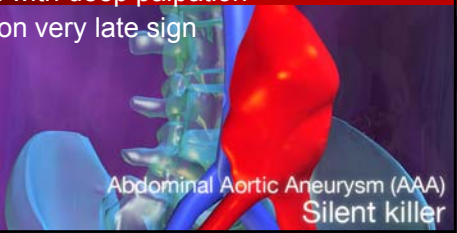
- Poor circulation to legs
- Urologic complaints
- Dull flank complaints
- Back pain
- Leg complaints
- Peripheral ischemic syndrome



site of aneurysm

### Pitfalls in the Elderly

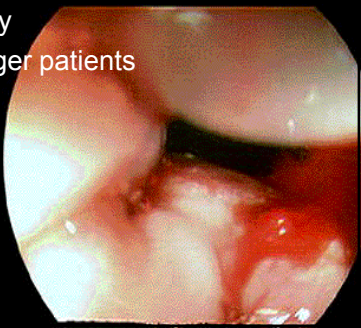
- Tachycardia may be blunted
- Femoral pulses may be = if aneurysm higher
- Pulsating mass may not be visible or only detected with deep palpation
- Hypotension very late sign



Abdominal Aortic Aneurysm (AAA)  
Silent killer

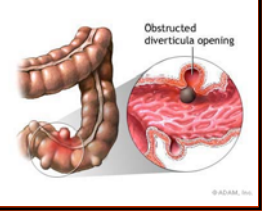
### GI Bleed

- Common in elderly
- Get thorough history
- S/S similar to younger patients



### GI Bleed Complications

- Can't compensate for blood loss
- Less likely to feel symptoms
- More likely to take ASA, NSAIDs
- More likely to be on blood thinners
- High risk for diverticulitis



Obstructed diverticula opening

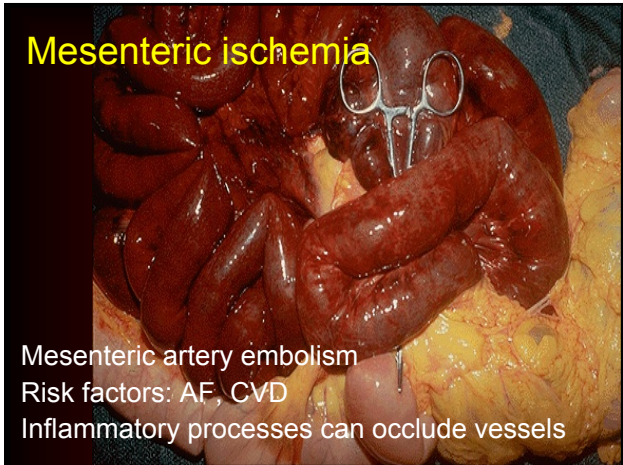
### Ruptured viscus

Rupture of organ into abdominal cavity  
Abdominal symptoms, N / V, fever,  
constipation, diarrhea, pain  
*Time sensitive*



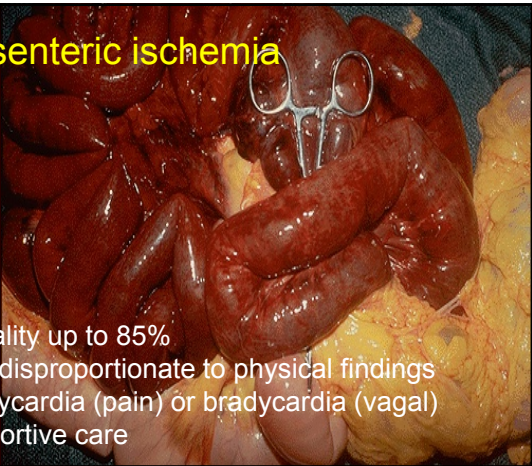
### Mesenteric ischemia

Mesenteric artery embolism  
Risk factors: AF, CVD  
Inflammatory processes can occlude vessels



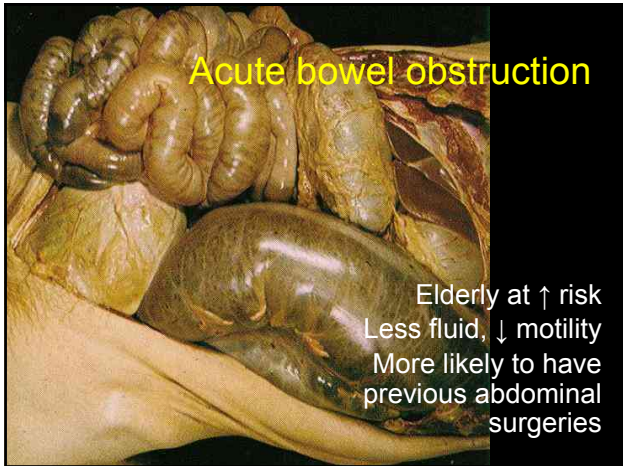
### Mesenteric ischemia

Mortality up to 85%  
Pain disproportionate to physical findings  
Tachycardia (pain) or bradycardia (vagal)  
Supportive care



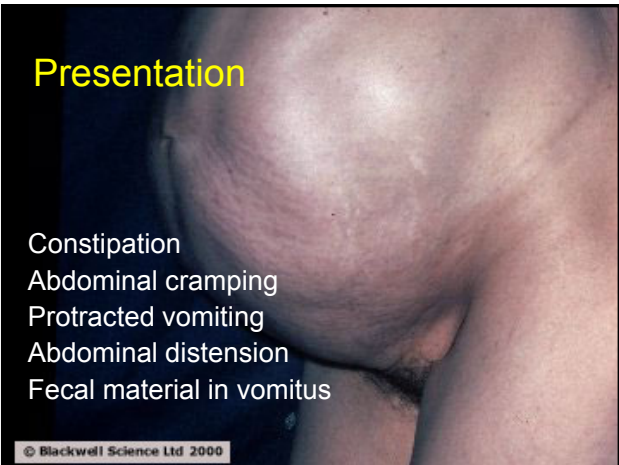
### Acute bowel obstruction

Elderly at ↑ risk  
Less fluid, ↓ motility  
More likely to have  
previous abdominal  
surgeries



### Presentation

Constipation  
Abdominal cramping  
Protracted vomiting  
Abdominal distension  
Fecal material in vomitus



### Treatment

Supportive care  
May be severely dehydrated  
Can lead to hypovolemic shock  
Time sensitive patient



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### Other causes of abdominal pain

- Renal colic
- Acute cholecystitis
- Peptic ulcer disease
- Diverticular disease: 50% over 70 years have diverticulosis

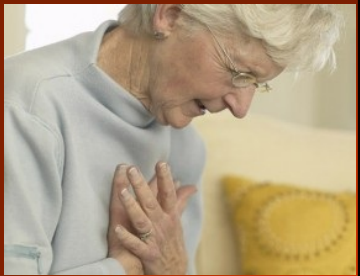


### Increased mortality risk

- 4x ↑ in mortality rate
- Silent ischemia
- ↓ pacemaker cells = ↑ dysrhythmias
- Less sensitive to natural catecholamines
- Delay in seeking treatment
- Decreased # of muscle cells
- Diminished CO

### Presentation

- Dyspnea
- Diaphoresis
- AMS
- GI complaints
- Syncope
- Weakness
- HF



### Respiratory complaints



### Common etiologies

- |             |                          |
|-------------|--------------------------|
| COPD/Asthma | Lung cancer              |
| HF          | Pulmonary embolism       |
| ACS         | Tuberculosis             |
| Pneumonia   | Occupational lung damage |

## Pneumonia

Leading cause of infectious disease deaths  
1.2 million cases  
Overall mortality 15%  
Common EMS call



## Risk factors

Reduced immunity  
Other chronic diseases  
Invasive tubes  
GI distress (aspiration)



## Presentation

Subtle or obvious signs  
Less likely to have productive cough, chest pain, fever  
Crackles may not be present due to dehydration  
Delirium!!!



## Bad signs

Rate >30  
Ventilatory support  
Bilateral lungs  
50% of 1 lung  
SBP < 90  
Diastolic BP < 60  
Urine output < 20 mL per hour

## Treatment

Oxygen if hypoxic  
If wheezing, contact OLMC for albuterol  
Encourage coughing  
Suction if necessary

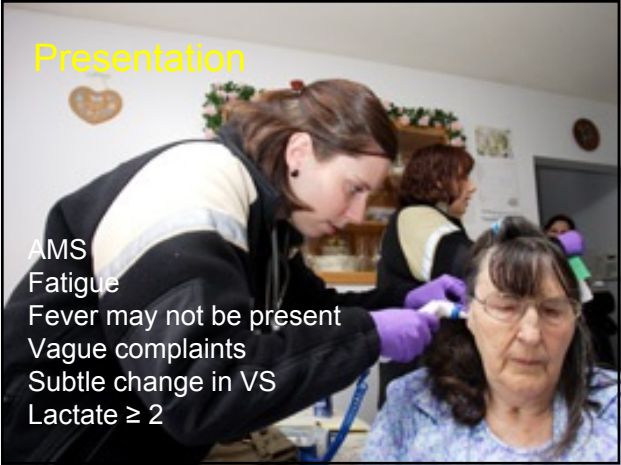
## Sepsis

Usually due to UTI, pneumonia  
Mortality up to 81%  
Usually gram negative bacteria (worse than gram positive)





### Presentation



AMS  
 Fatigue  
 Fever may not be present  
 Vague complaints  
 Subtle change in VS  
 Lactate  $\geq 2$

### Treatment

Optimize oxygenation  
 Fluid challenges 30 mL/kg  
 Dopamine (vasopressor) may be necessary

### Headaches


Temporal arteritis

- Inflammatory response
- Unilateral pain, dull,  $\uparrow$  at night
- Scalp pain

Subdural hematoma  
 Tension headache: Most common type

### Burns

3<sup>rd</sup> leading cause of traumatic death  
 Burns  $\geq 15\%$  BSA have mortality up to 80%  
 Prevention is key




### Alcohol abuse

17% of those > 60  
 1.5 million alcoholics over 65  
 High incidence DUI  
 Mgt of alcohol withdrawal very difficult



Higher risk for rib fractures  
 Predisposed to ARDS  
 Prone to ventilatory failure  
 Aggressively control airway and breathing



**Geriatric TRAUMA**

### Geriatric trauma

5<sup>th</sup> leading cause of elderly death  
Up to 40% of all trauma  
Up to 88% require long term care afterwards  
Falls most common MOI: 1/3 of elderly



### Trauma triage in elderly (SOP)

Advanced age should lower threshold for field triage directly to a TC if injured

#### Recommendations:

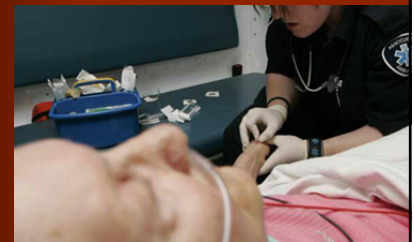
- Advanced age is NOT by itself a predictor of poor outcomes & should NOT be used as the sole criterion for denying or limiting care
- Pre-existing conditions adversely affect outcomes. This effect becomes progressively less pronounced with advancing age.

### Trauma triage in elderly cont.

≥ 65: GCS ≤ 8 associated w/ poor prognosis  
Geriatric pt w/ TBI & GCS <15 = same mortality as adult w/ GCS <10  
Post-injury complications negatively impact survival  
Implement therapies to prevent and/or reduce complications

### Trauma triage in elderly cont.

Unless moribund on arrival, resuscitate aggressively as majority will return home and return to independent function



### Trauma triage in elderly

≥ 65: RTS < 7 &/or RR < 10 assoc w/ 100% mortality  
≥ 55 at increased risk for under triage to trauma centers even when they meet triage criteria

Jacobs, D.G. et al. (2001). Practice management guidelines for geriatric trauma. *East Practice Management Guidelines*.

### Trauma

Complete history important  
Assume normal organ deterioration  
Early detection is key for their survival  
Aggressive resuscitation

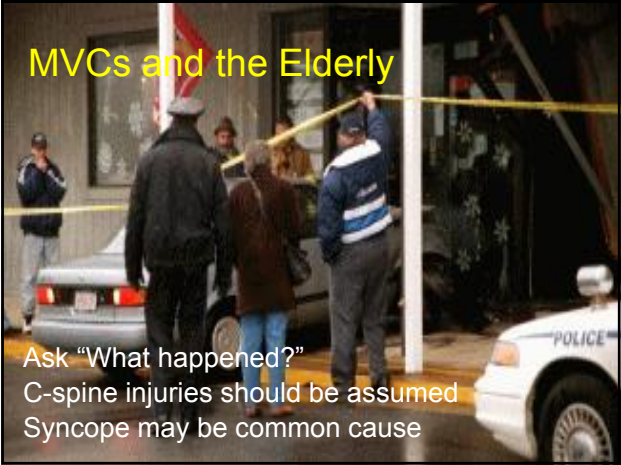


### MVCs involving older adults

- 25-50% trauma deaths
- Higher risk for crashes than teenagers
- High incidence vehicle vs. pedestrian
- Passengers at risk for pelvic & extremity fx
- Pelvic fx 20-50%



### MVCs and the Elderly



Ask "What happened?"  
 C-spine injuries should be assumed  
 Syncope may be common cause



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The End

"He's complaining of chest pain, shortness of breath, cramps and dizziness. Do you sell earplugs?"