



Geriatric Critical Care Transport

They are not just old kids

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Disclosures

- None
- Nada
- Nein
- Nyet

Goals for today

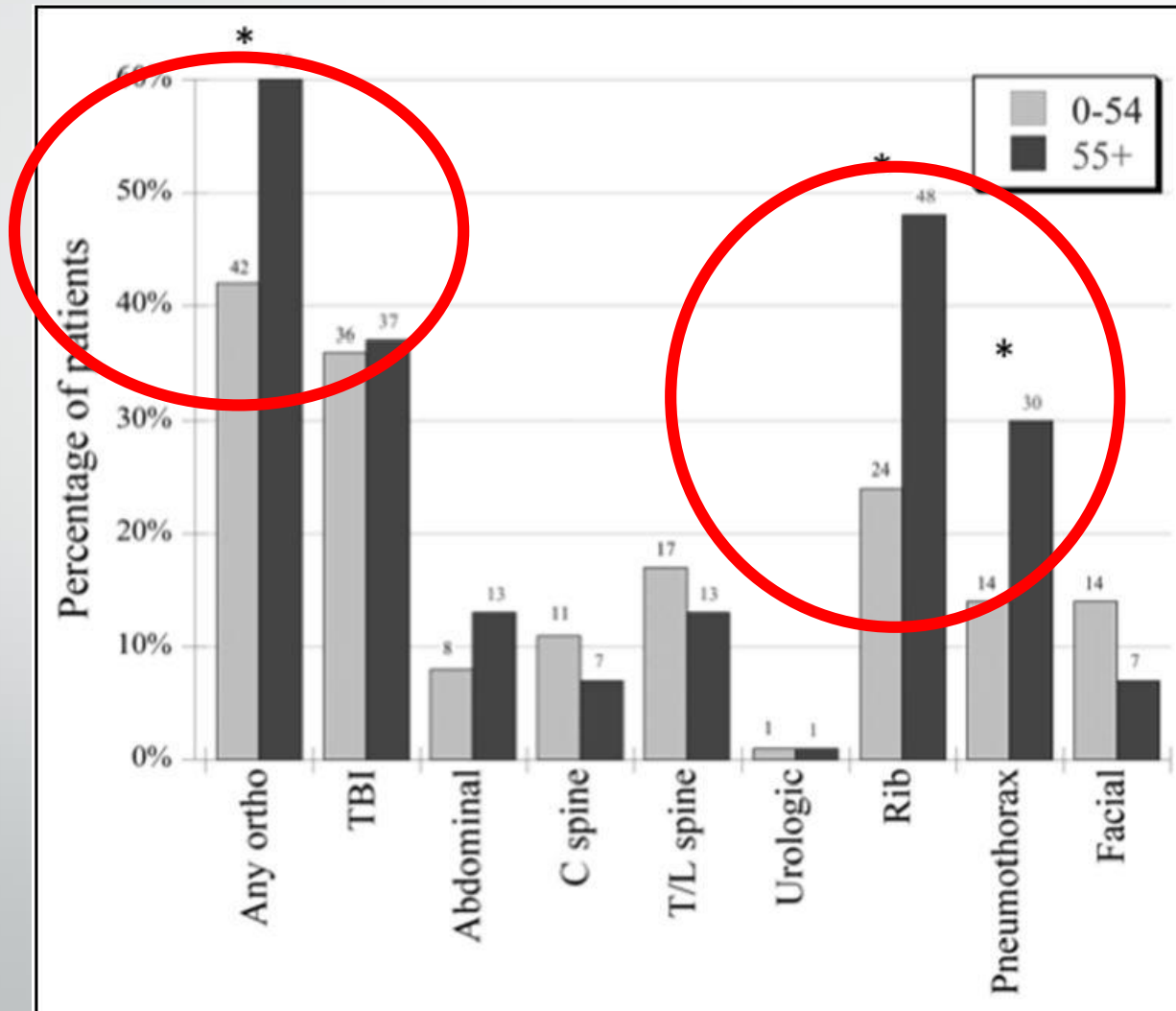
- Safely transport/treat us old guys/gals
- Understand the physiologic changes of aging that make #1 difficult
- Avoid the pitfalls we will throw in your pathway
- Be able to take good care of us without necessarily using all the high tech “fun” stuff
- Deal with more “ethical” issues

Why are we talking about this????

- Older patients make up 12% of the population and rapidly growing
- They account for way more of the “sick” patients and that is growing
- United States, approximately 42% to 52% of ICU admissions are geriatric patients
- largest increases in trauma deaths were in patients in their 5th and 6th decades of life
- Why? Because medicine has gotten very good at “fixing” acute killers
- Degenerative/chronic diseases are getting more common
- So we are transporting lots more “acute exacerbation of>>>>”
- Even when it is a “trauma” case is affected by the chronic underlying conditions

Trauma?

- Riding into the golden years: injury patterns and outcomes of advanced-age motorcycle trauma Muratore Am J Surg 2016



So Why are the “age enhanced” difficult??

- No 1 of course
- “The good die young”
- Changes in physiology
- Co Morbidities increase
- Medications they are on

Aging

- Has actually 2 aspects
 - Chronologic
 - Physiologic
- Both of these affect both:
 - Presentation of and
 - Response to treatment of Everything
- Finally the elderly are more prone to complications of both trauma, illness and treatment

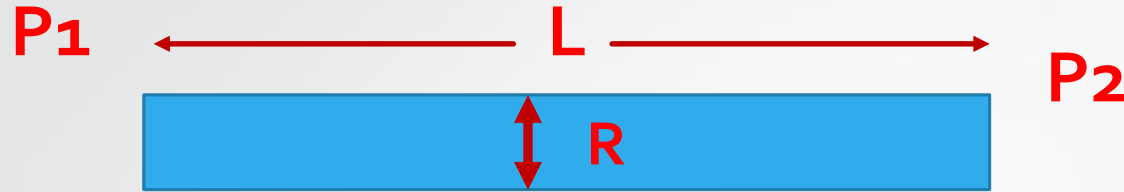
Effects of Aging

- “immunosenescence” waning of the ability to prevent infections and response to those infections.
- The ageing immune system is characterised by a decline in stem cells, alterations in T lymphocyte production, blunting of the B-cell led antibody response and reduced phagocytic activity of neutrophils, macrophages and natural killer cells
 - Prevention:
 - Skin becomes “fragile” portal of entry
 - Immune cells are old and less responsive

Response:

- Aging decreases the tachycardic response
- Blood pressure response is blunted as well
- heart becomes less responsive to sympathomimetics
- Increasing diastolic failure
- More dependence on atrial “kick”
- Blood vessels become “stiff” so more dependent on BP for flow

Blood Flow



$$\text{Flow} = k(P_1 - P_2) L / R^4$$

Young people increase flow by increasing R

Old folks can't increase R so have to increase P₁

Co-morbidities

- Aging is associated with:
 - Increasing incidence diabetes
 - Increasing cardiac problems especially a-fib
 - Increasing incidence of Mental decline/ dementia (mild to severe)
 - Decreased lung function/More COPD

OMGTML

- Oh My Gosh The Med List
- Elderly patients are on multiple medications
- The number of patients and medications is increasing
- Some of these will totally screw your exam/evaluation
- Some of these will worsen whatever is wrong with your patient
- All of these will interact with your medications



When you give almost any medicine to Elderly

- **You are performing a one of a kind interaction study**

Anticoagulation Antiplatelet drugs

- Increase bleeding
- Increase mortality in trauma (and that includes trauma from procedures) but may be only in head injuries??
 - Wojcik R, Cipolle MD, Seislove E, Wasser TE, Pasquale MD. Preinjury warfarin does not impact outcome in trauma patients. J Trauma 2001;51:1147-51
- Increase risks of other medications

Antiarrhythmics

- A Fib is increasingly common as get older hence more patients on “rate or rhythm” drugs.
- Many cardiac drugs change/decrease ability to increase heart rate
- Many (if not all) also mess with your ability to increase your BP
- Most are also proarrhythmic
 - Reason we stopped treating “asymptomatic PVCs”
- ie: Totally screw your ability to monitor the patient.

Blood pressure meds?

- Many drugs lower blood pressure by blunting the ability to vasoconstrict.
 - I.e. when start going into shock can't compensate
 - Don't know what "starting" blood pressure was
 - Many are the same "antiarrhythmics" we discussed last slide
- Elderly like infants have trouble increasing stroke volume to compensate

How about some evidence??

- Takao et al Early predictors for massive transfusion in older adult severe trauma patients Injury, Int. J. (2017)
 - Compared ABC, TASH, and PWH scores for massive transfusion risk
 - Found worked well for younger but lousy for older (>64) patients
 - Primarily because VS and SI did not work well
 - Conclusion
 - Have a lower threshold for intervention
 - Injuries more predictive than scores
 - FAST results, unstable pelvic fracture, and long bone open fracture of the lower limbs.
 - Pre-injury anticoagulant or antiplatelet agent use and lactate levels were risk factors

Joyce et al, Critical Care and Trauma Considerations in the Geriatric Patient

- Nice review of the literature
- Suggests that age alone is not a risk factor
- “frailty” may be a better predictor
- Better correlation between Frailty and physiology than age & physiology

Frailty?

- Measure of “overall decline” or general multi organ
- Several scores most are somewhat complex and hard to perform in trauma
- Online calculators
- Simplest is the “timed-up-and-go test (TUGT)”.
- Which of course can't do in most (all) trauma

Delirium

- A killer in critically ill patients
- Worse in Elderly
 - More start out delirious
 - More develop it
- Prevention is best
- Interventions that have been shown to be effective
 - noise reduction,
 - reorientation,
 - cognitive stimulation,
 - return of vision and hearing aids,
 - Proper hydration,
 - avoidance of sleep deprivation, and
 - pain control

Treating Elderly?

As you get older you have:

- Decreased drug clearance
- Decrease level of proteins
- Decreased protein binding
- Decreased lean and increased fat body mass
- Decreased circulating blood volume

So what to do?

- Be aware that your VS may not be reliable except for
- The one you don't really measure?
- RR may be the most reliable indicator of physiologic stress
- If of course not intubated paralyzed

What to do?

- Decrease that noise
 - Head sets may be even more important
- Treat pain aggressively but carefully
- Monitor ETCO₂ as hyperventilation may be first warning sign of bleeding/shock
- ETCO₂ will also warn of respiratory decline
- Get off the backboard fast
 - watch for skin breakdown
 - Watch for respiratory compromise
 - Increased risk of aspiration
- Be sure hearing aids glasses come with patient hearing aids mixed blessing in flight but probably better if in and patient can hear

What to do

- Understand that your drugs may work better or worse in this population
- Anticoagulation/antiplatelet is always a consideration
- Drug interactions should always be on your mind
- Drugs (prescribed and non prescribed) may be contributing
- Be careful to manage fluids closely
 - Too little may be as bad as too much (or worse)
- Manage Oxygen carefully
- Watch out for arrhythmias

AGITATION!!

- First second and third be sure not a “medical” problem.
 - Hypoxia
 - Blocked Foley
 - Pain
 - Restrain/strap too tight
 - Delirium
 - Etc etc etc

Sedation?

- Intubated patients
 - Use pain medication (fentanyl/ketamine etc.) ideal fent drip
 - Avoid Benzos if possible
 - Use propofol/dexmedetomidine if need sedation
 - Avoid sedation that is deeper than needed
 - Use a scale such as RASS
- Non intubated
 - Be sure not anything on previous slide
 - Probably still should avoid benzos
 - Haldol or if lucky droperidol



CAN OF
WORMS
AHEAD

OK now what?

- You are getting ready to load and the family/paramedic hands you some papers
- MOLST or POLST etc whatever your state uses
- Now what do you do?

MOLST POLST

- MOLST/POLST:
- These are **M**edical (or **P**hysician) **O**rders for **L**ife **S**ustaining **T**reatment
 - These are actual orders signed by a physician approved to operate by
 - Problem is they are often confusing and contradictory
 - Clemency et al J post acute and long term care (JAMDA) 2016 Decisions by Default: Incomplete and Contradictory MOLST in Emergency Care

Advance Directives

- Advance directives are something patient wrote or told someone or checkboxes on a form and then got notarized to guide medical treatment
 - These are NOT medical orders but “guides” to produce medical orders
 - Require a doctor to order them (medical control?)
 - Again are often confusing or “don’t fit”

DPOA

- DPOA (**D**urable **P**ower **O**f **A**ttorney) is a legal document that gives decision making capacity to another person **IF PATIENT IS INCAPACITATED**
- Generally accompanied by advance directive to help the DPOA.
- Surrogate is generally/always appointed by a court due to incompetence (a legal term). Has complete decision making capacity for patient.

What now?

- As the population ages and chronic diseases become more common
- These (hopefully) become more common
- Probably need a “plan” for dealing with these.

DISCLAIMER!!!!

- I have no answers to the questions that follow

Scenarios

- 75 y/o with moderate-severe COPD who decides if heart stops doesn't want CPR/intubation but would like antibiotics and NIPPV presents with pneumonia to small community hospital
- Lives at home and has been doing well on home O₂
- Falls in bath hitting chest having severe pain with breathing
- VS BP 100/89, P 70 RR 33 SAO₂ 90% tender chest with compression pain
- Has been going downhill more SOB
- Do you fly DNR patients?
- Would you fly this DNR?

Scenario 2

- 90 y/o lady no significant history fell and then complained of headache and passed out.
- Exam responds to painful stimuli only VS BP 195/120 HR 85 RR 20 SAO₂ 95%,
- EMS presents you with a advance directive that says No CPR advanced procedures or surgery BUT antibiotics and fluids OK
- Family at scene says "DO EVERYTHING"

Conclusions

- There are more of us every day
- We are a tricky group and will bite you if not careful
- VS (except maybe RR) are unreliable for lots of reasons
- We have multiple co-morbidities and take multiple medications to make your life difficult
- We are often on medications that keep us from clotting
- We don't respond as well as we should to the medications you use to make us better

On the other hand

- If you treat us right we can do surprisingly well
- We can go on to see our great grandkids etc.
- We will be those challenging patients you always wanted
- Oh yes we will challenge your ethical thinking as well as your medications (and there's no app for that)
- We and our families will be grateful
- And most of us understand that the best of you can't make us 25 again.

Finally

- You will all get to be an Older child someday

Questions?

- Remember a good question is one I know the answer to