

# The "Tric's" of Trauma:

## Assessing Pediatric & Geriatric Patients

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# Assessment of Injured Patients



- **Airway with**  
C-spine stabilization
- **Breathing**
- **Circulation**
- **Disability**
- **Exposure**
- **Full vital signs**
- **Give comfort**
- **Head to toe**
- **Invert**

# What about pediatric & geriatric trauma assessment?

Some is different, some the same





Trauma can be caused by same  
MVC's  
Bicycles  
Pedestrian  
Falls



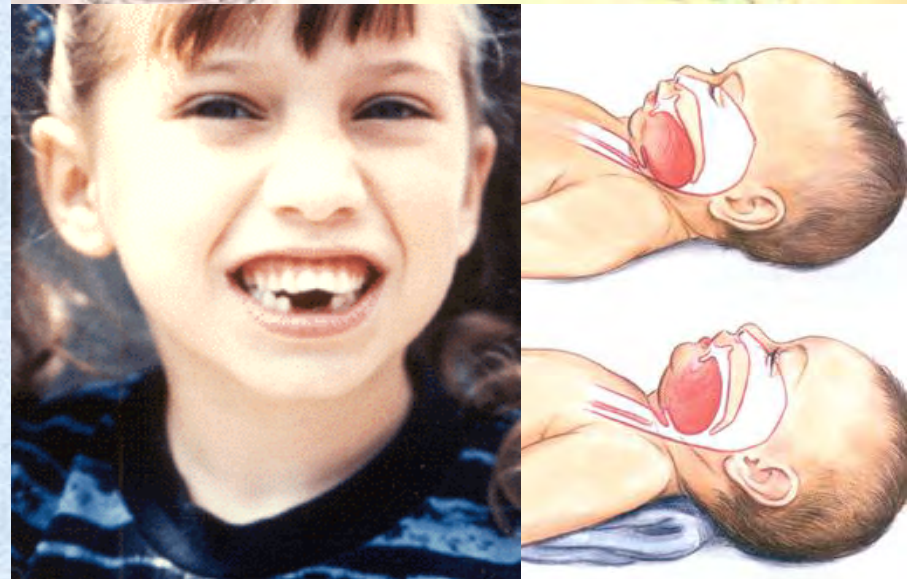
# Assessment will be the same - but differences found!

- Airway with C-spine
- Breathing
- Circulation
- Disability
- Exposure
- Full vital signs
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- Head to toe
- Invert

Pediatric & geriatric patients are assessed in the *same sequence* as adults. But there will be differences in findings.

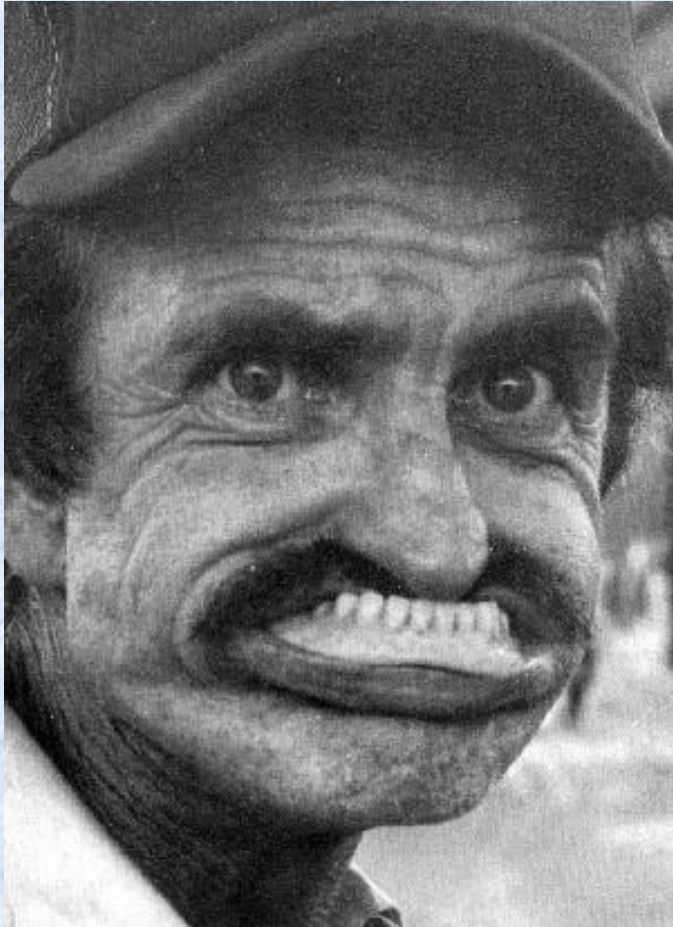
# Airway ~ Kids

- **Smaller diameter & space** - occludes faster (wet stuff, swelling, objects)
- **Teeth** - yes/no/ previously missing/ newly missing?
- **Big tongue & tracheal flexibility**
- **Obligate nose breathers** - (up to age 2-3 months)





# Airway ~ geriatrics



- Floppy tracheal structures (↑ aspiration)
- Dentures/partial
- Decreased sensation in mouth  
(dentures/stroke, etc)
- Hard to align airway due to curved spine



# Cervical spines - Kids



- Lax ligaments/neck muscles
- **BIG** head (momentum)  
& (alignment)
- **SCIWORA** (may not have step off, deformity, only ↓ motion/sensation)
- Don't like/fear laying flat
- Hard finding right sized equipment





# Cervical spines ~ geriatrics

- Curvature of spine
- Arthritis of bones  
~ boney fragments
- Fragility of vertebral bones
- Fall from standing is enough to injure boney structures
- Flat is not an option sometimes



# Breathing ~ kids

- Slide scale on rate ~ generally faster (12-60)
- Ribs less protective (flexible)
- Belly breathers
- Weaker muscles - tire quickly
- Lung sounds - hard to differentiate
- Smaller alveoli/volume
- ↑ toxic inhalation



# Breathing ~ geriatrics



Assisting  
ventilation  
must be done  
carefully

- Ribs less protective (brittle)
- Weaker muscles - tire quickly - hard to cough
- Less alveoli & more fragile
- Often hypoxic, but don't look/feel it
- ↓ HGB to carry O<sub>2</sub> & run lower O<sub>2</sub> sats normally
- Lung sounds - more baseline noise
- COPD/CHF - Oxygen toxic easier
- Lungs do not tolerate fluids as well



# Circulation ~ kids

- Heart rate -

sliding scale (60-200) consider fear factor

- Vessels ~ super-constrict

- Volume ~ 90 cc/kg

10kg = 900cc 20kg = 1600cc

30kg = 2400cc

- Lose 25% volume & still compensates

- Heart works faster not harder

- Central vs. distal pulses

- BP ~ age x 2 + 70 (lowest)

- Capillary refill (2 seconds)





What does fear do to heart rate?

# Circulation ~ geriatrics



- **Heart rate** - varies, often irregular, meds/ pacemaker can affect it, Go into atrial fib with rapid response if dry, cannot pump harder
- **BP** ~ meds affect it? "low" for pt.?
- **Stiff pipes** - don't constrict plus drugs prevent → mask shock
- **Renal failure & CHF** if fluid overloaded, but many are dehydrated to start
- **MI, stroke, as part of shock?**



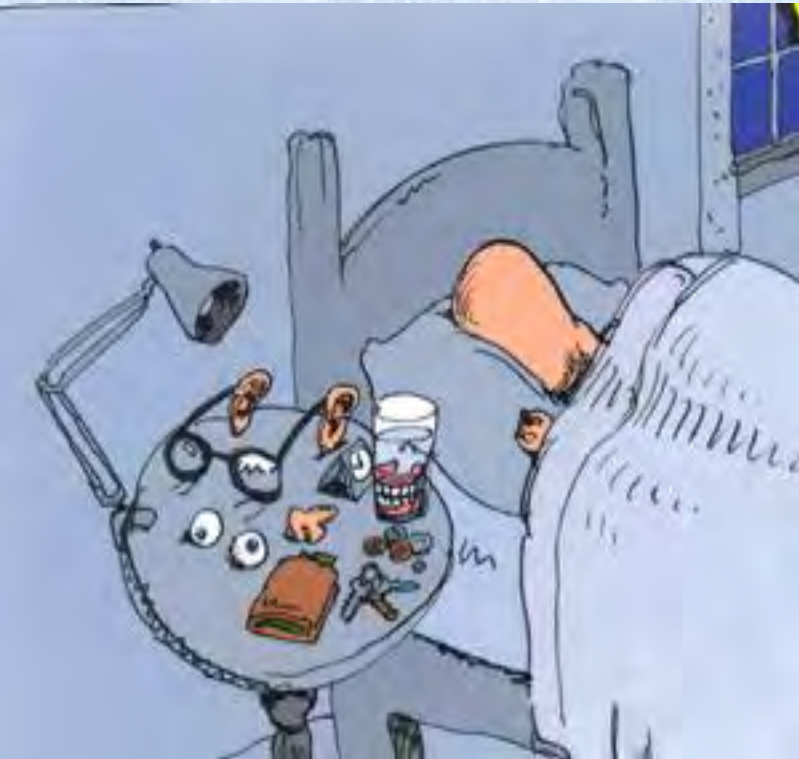
# Disability ~ kids

- Scared of strangers
- A & O x 3? GCS changes with age  
Answer questions? Follow commands?
- Burn sugar quickly ~  
may be hypoglycemic
- Get cold easy ~  
may be hypothermic
- Soft spots in head ~  
brain not protected Also easy to shake
- Able to walk for  
disaster triage?



# Disability ~ geriatrics

- What is their “normal”?



- **Brain shrinks** ~ More room to rattle - sub-dural hematoma's higher risk of head bleeds 2° to meds
- **A & O x 3?** Can they hear you, see you, feel you touch?
- **Previous disabilities** from stroke, diabetes, etc
- **False eye?**
- **Slower processing time** when asked questions or to do stuff

# Additional Disability Thoughts

Factors that can cause problems

- Dementia\*
- Alcoholism
- Depression\*
- Medications
- Delirium\*
- Metabolic problems



\* the 3 D's

Mentioned again, as can affect treatment and care



# In the geriatric patient especially consider "blood thinners"

- **Anti-coagulants**

Warfarin (Coumadin/Jantoven)

Lovenox (LMWH)

Pradaxa (dabigatran)

Xarelto (rivaroxaban)

Arixtra (fondaparinux)

Eliquis (apixaban)

Fragmin (dalteparin)

- **Anti-platelets**

Aspirin

Plavix ( clopidogrel)

Persantine/Aggrenox (dipyridamole & with ASA)

Pletal (cilostazole)

Ticlid (ticlopidine)

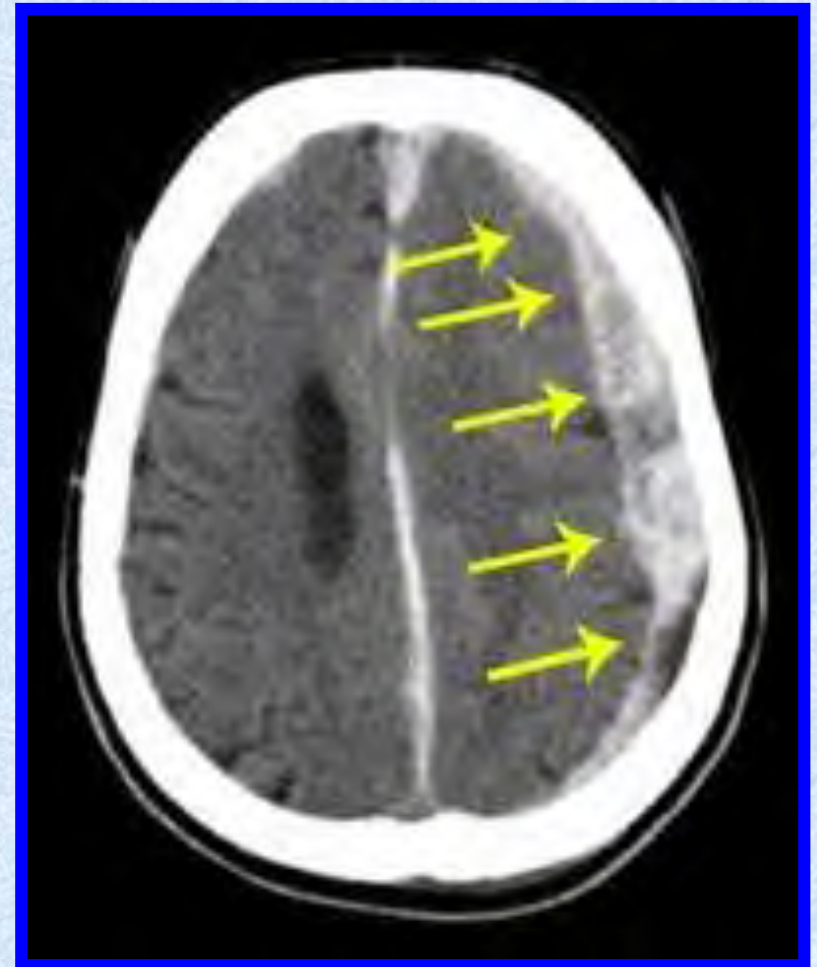
Brilinta (ticagrelor)

Effient (prasugrel)

- **Herbals**

Ginkgo, Garlic, Ginseng

Ginger, St. John's Wort



# Exposure ~ kids

- Lots of clothing ~ hard to find kid
- Lose heat quickly through head and ↑ surface area
- Thin skin - absorb toxins quickly
- Don't like their clothing take off



# Exposure ~ geriatrics



- Thin skin
- Decreased Sub Q fat ~ get cold faster, no protection for boney prominences , also leads to increased spread of blood under skin
- Absorb toxins quickly
- Lots of clothing, don't like their clothing taken off





As an FYI on your geriatric patients - common pressure points that develop redness in as little as 20 minutes. Have seen similar in toes & elbows from boards and sheets, chins, and back of occiput from c-collar.

# Full set of vitals

## Pediatric

- Sliding scale ~ depends on age
- Compensate for shock well, then “tank” suddenly!
- Heart & respiratory rate, BP, cap refill
- Compare pulses
- Drop temp easy



Age x 2 + 70 compensated  
Age x 2 + 90 normal  
HR ~ 60 - 200  
RR ~ 12 - 60

# Full set of vitals

## Geriatrics



- Affected by aging body parts and medications ~ both in ability to compensate & masking shock states
- Do not tolerate shock well ~ stroke, MI
- HR often irregular
- "Normal" BP often actually shock
- Drop temp easily



# Give comfort ~ Same for both

- Caution with ice packs ~ thin skin
- **ONE** Voice talking
- **Distraction** ~ favorite thing, sweater, person
- **Gentle touch**
- **Start low, go slow with meds, but consider pain control**
- **Position of comfort**  
~ not necessarily flat



# Head to Toe

- Non-critical children tolerated toe to head exam better
- Geriatric patients do better if you touch them and get attention first
- Relates to “invading their space”
- Don't forget to check their back!





# Head to Toe

- In kids distended abdomen may be air, or blood ~ will affect breathing as well
- Older adults may not sense abdominal pain
- Also may not sense touch, or be able to follow command due to previous issues ~ stroke, diabetes.
- Kids may be afraid or uncooperative with exam





# Skin & bones

- Bone breaks more easily in older patients
- Bone bends more easily in younger patients
- X-rays harder to read on both
- Muscles & ligaments not as tough in both
- Both have thin, easily torn skin
- Treat based on pain & mechanism
- Kids will heal faster



Notice calcification of Aorta

# Why did they get hurt?

- On purpose?
- Distracted?
- Couldn't see/  
hear/limited  
cognition of  
potential injury?
- Unsafe behavior?
- Lack of safety  
equipment?



# Transport Decision

- Even if trauma seems minor, both geriatric and pediatric patients need specialized trauma services/care
- Transport to specialized center if at all possible

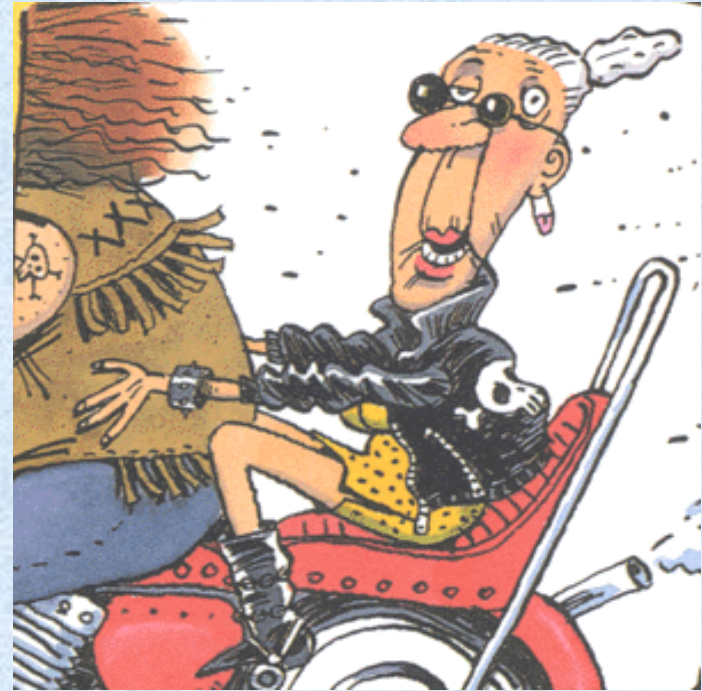




# Remember ~ The Same, But Different



- Airway  
with C-spine
- Breathing
- Circulation
- Disability



- Exposure
- Full vital signs
- Give comfort
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- Invert

Use the same mnemonic to assess pediatric and geriatric patients. But be aware, they have differences that put them at risk of abnormal findings, as well as decompensating faster.

