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!

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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/partials
- 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

- 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 O2 & run lower O2 sats normally
- Lung sounds - more baseline noise
- COPD/CHF - Oxygen toxic easier
- Lungs do not tolerate fluids as well

Assisting ventilation must be done carefully
Circulation ~ kids

- **Heart rate** - sliding scale (60-200) consider fear factor
- **Vessels** ~ super-constrict
- **Volume** ~ 90 cc/kg
  - $10\text{kg} = 900\text{cc}$
  - $20\text{kg} = 1600\text{cc}$
  - $30\text{kg} = 2400\text{cc}$
- **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
  - Plavic (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-collars.
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

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Use the same pneumonic 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.