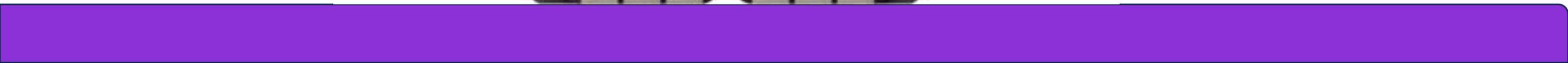


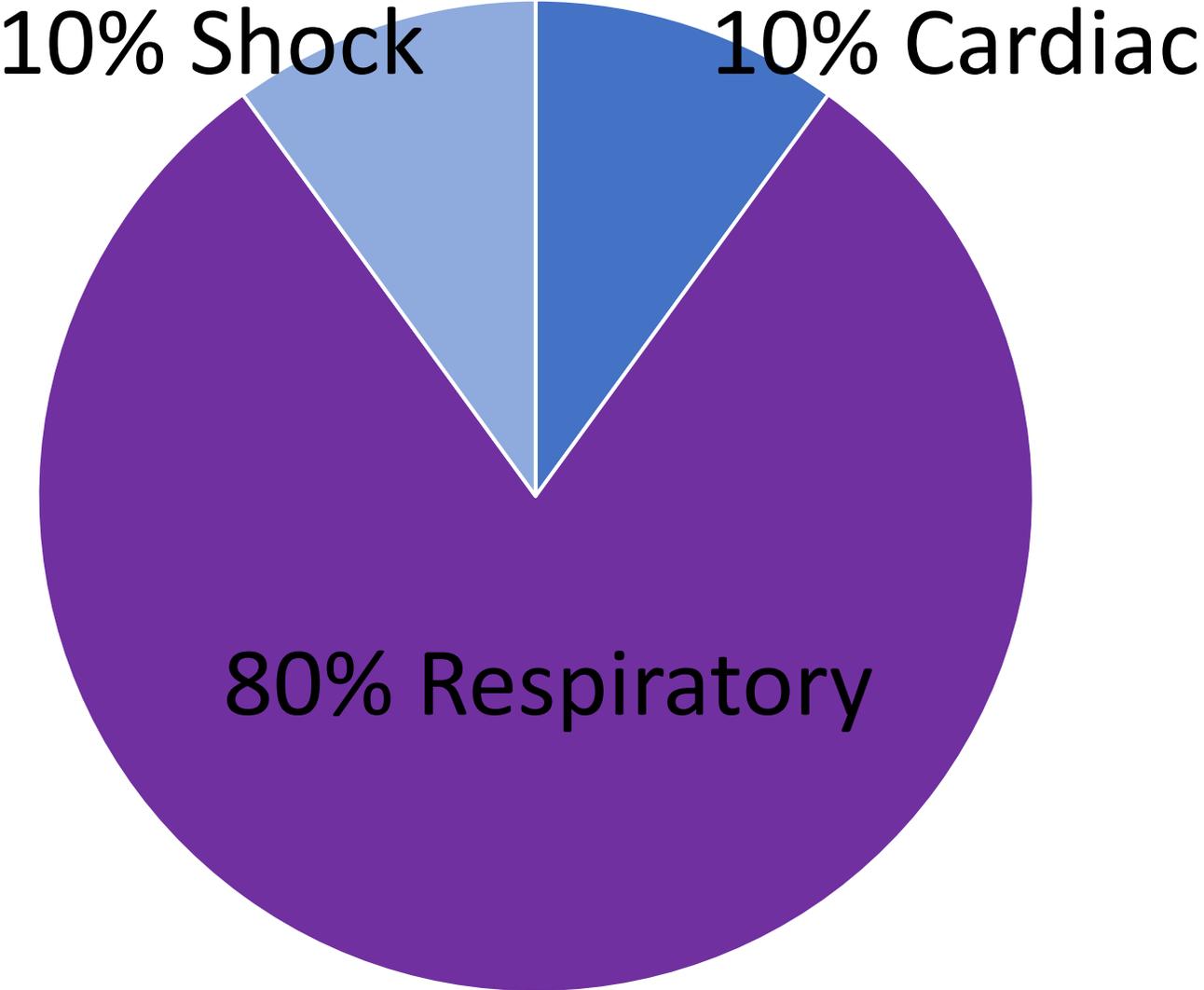
My Patient is a Troll!

Julie L Bacon, RN, MSN-HCSM,
CPN, C-NPT, NPD-BC, NE-BC

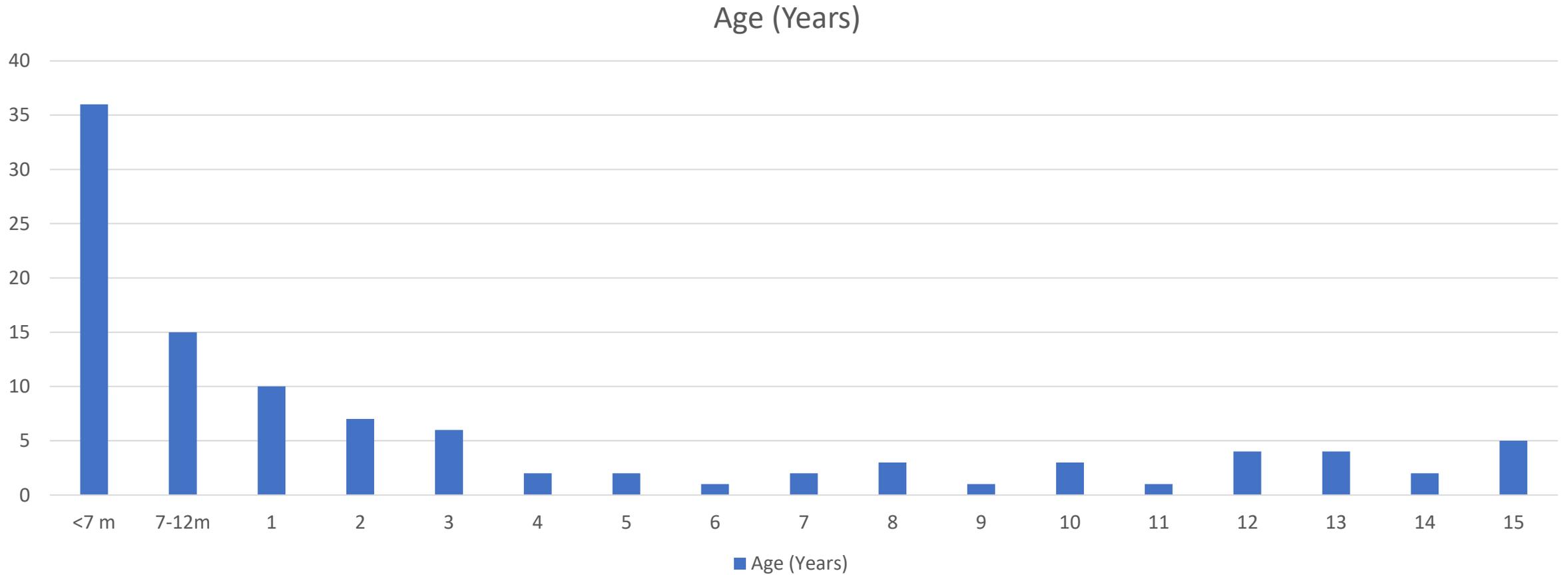




Pediatric Cardiopulmonary Arrests



Age Distribution of Arrests





- Injury is the leading cause of death for pediatric patients >1 year (US)

- Approximately 20 deaths/day

- Leading causes

MVC

Suffocation

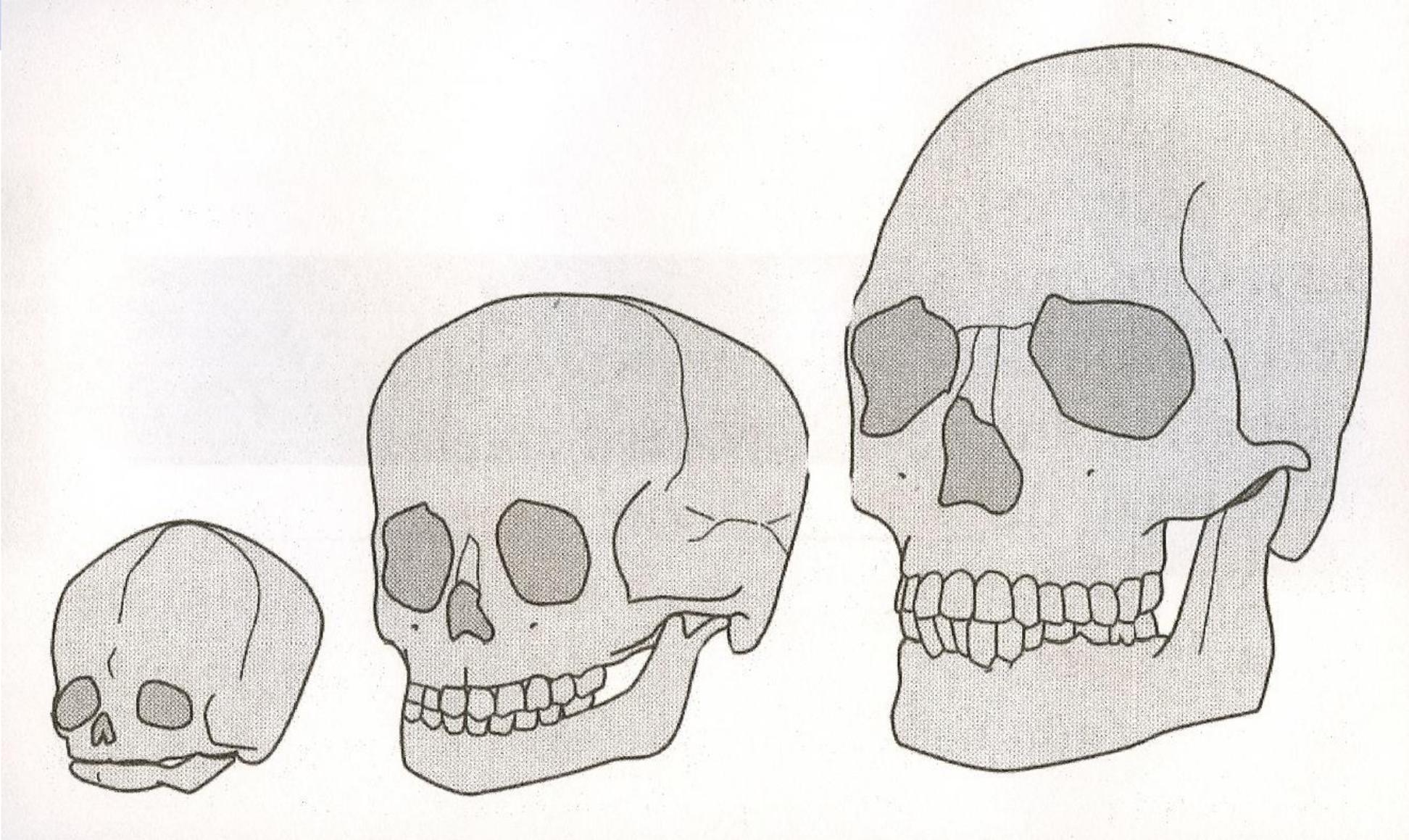
Drowning

Fires and Fall

Non-Accidental



Let's Start at
the Top!







Polling Question #1



-
- Fontanelle
 - Sutures until @ 18m
 - Thin and pliable
 - Inner surface very smooth
 - Brain does not fit tightly

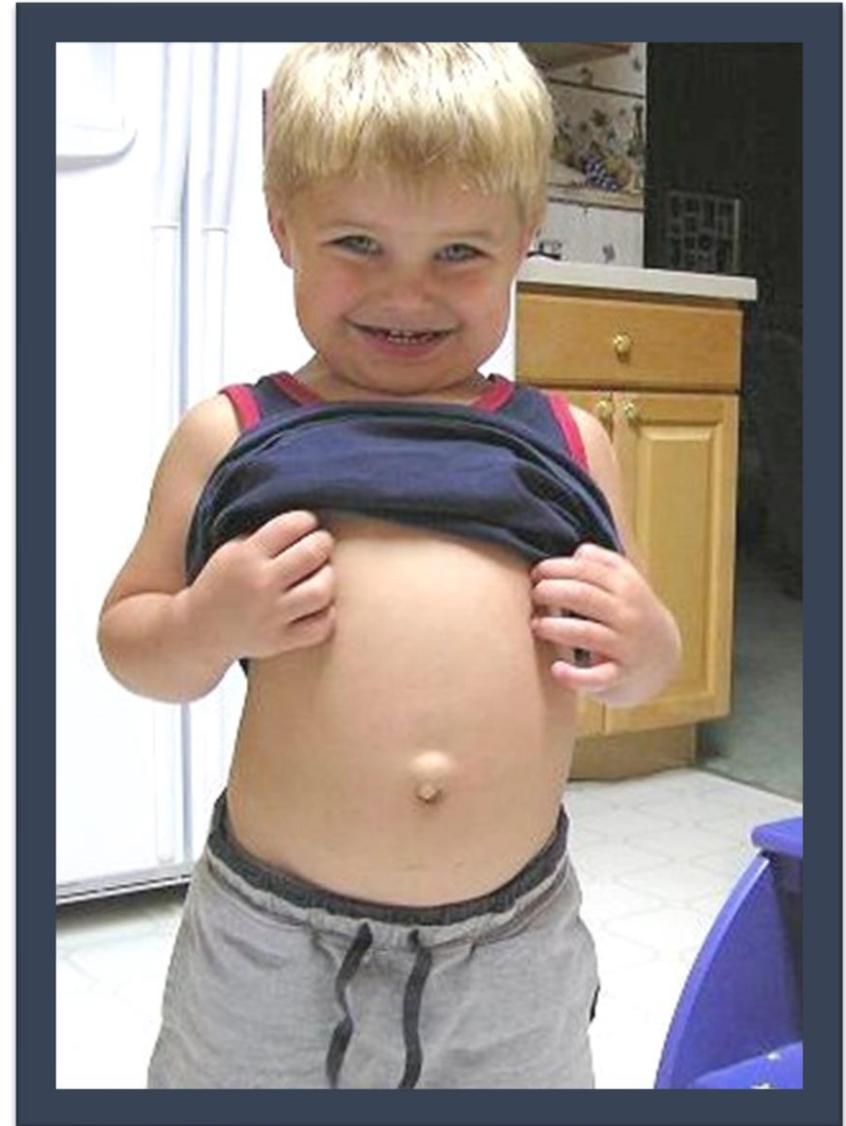
How About
the Middle?





Polling Question #4

- Ribs are higher and more horizontal
- Bones are more flexible
- Abdominal muscles are less developed in children
- Thinner abdominal walls





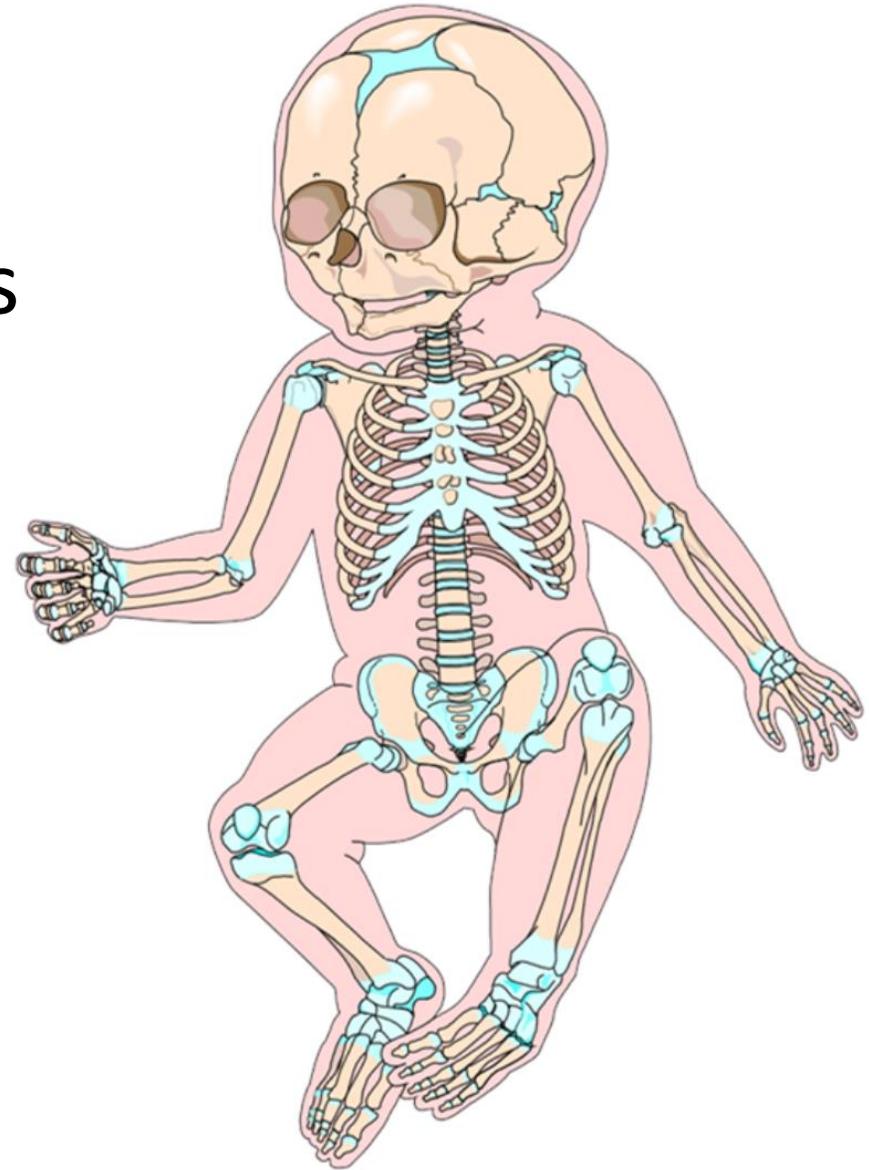
Solid Organs Are –

- Disproportionately larger
- Intestines not fully connected
- Bladder at level of umbilicus



What
About
Bones?

- Open growth plate in long bones
- Calcified Cartilage
- Flexible, bendable
- Heals quickly



- “Bending” Fractures
 - Greenstick

- Ligaments Stronger
 - Energy transmitted to bone
 - Less sprain, more fracture



Applying the Knowledge #1





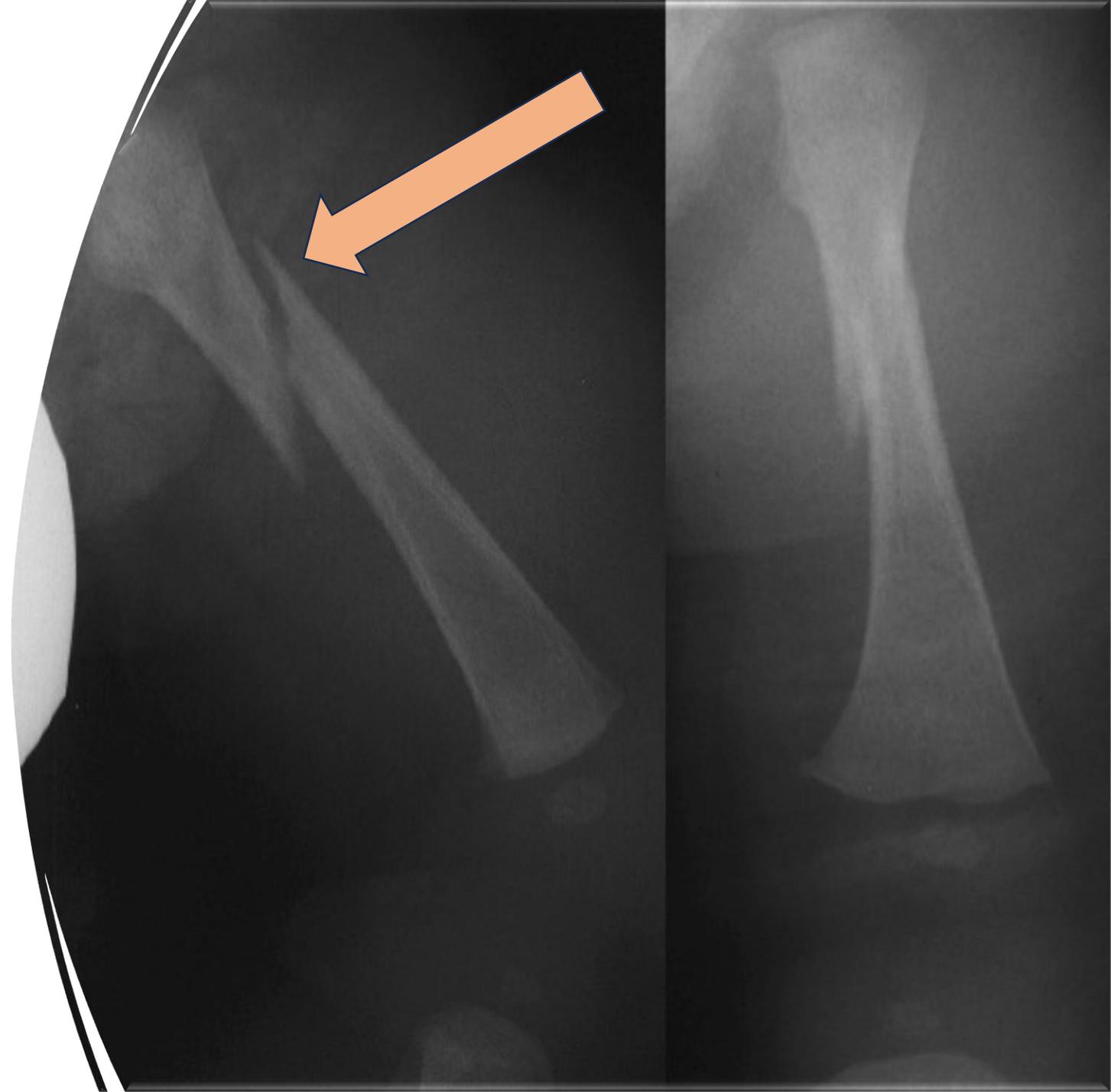
—

- **Your Call:**

- First time parents with six-week-old infant
- Complaint of infant fussy and not feeding
- not kicking with left leg, and “crying inconsolably”
- No history or mechanism of injury

What do you think about this fracture?

- Dependent on MOI and developmental age of the child
- Long bone fractures are very concerning in a non-mobile child



Let's get more information!

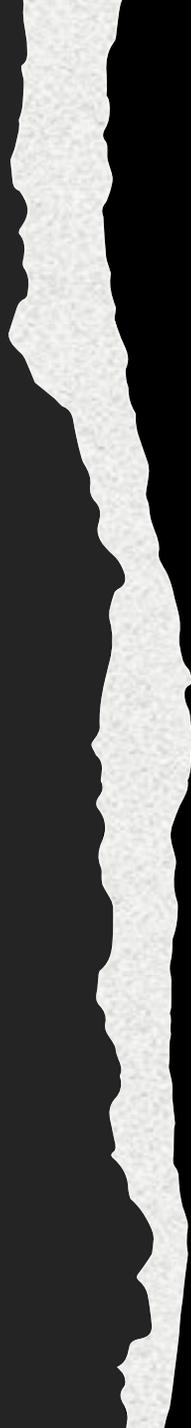
Skeletal Survey

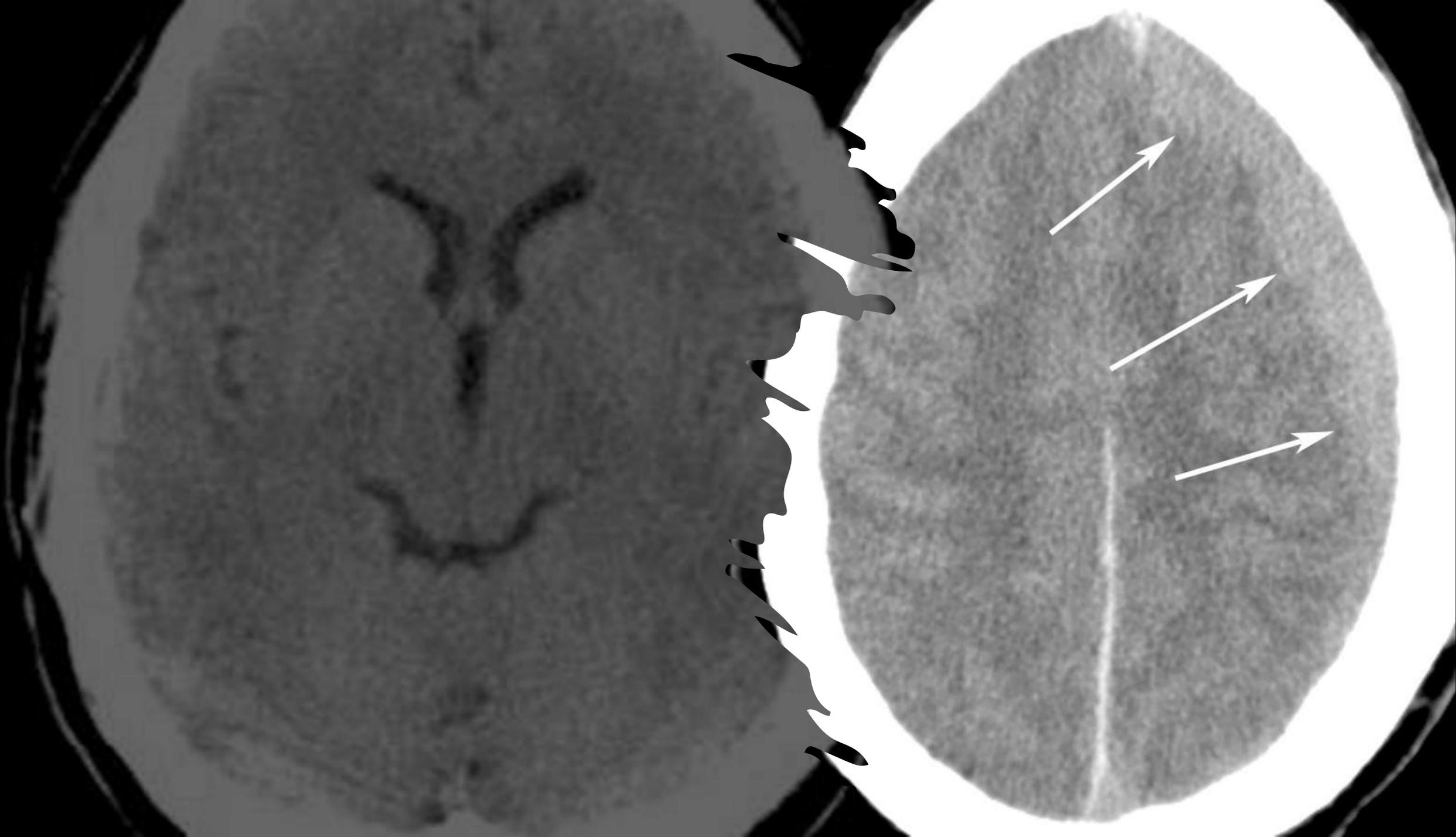
Bone Scan

CT Scan

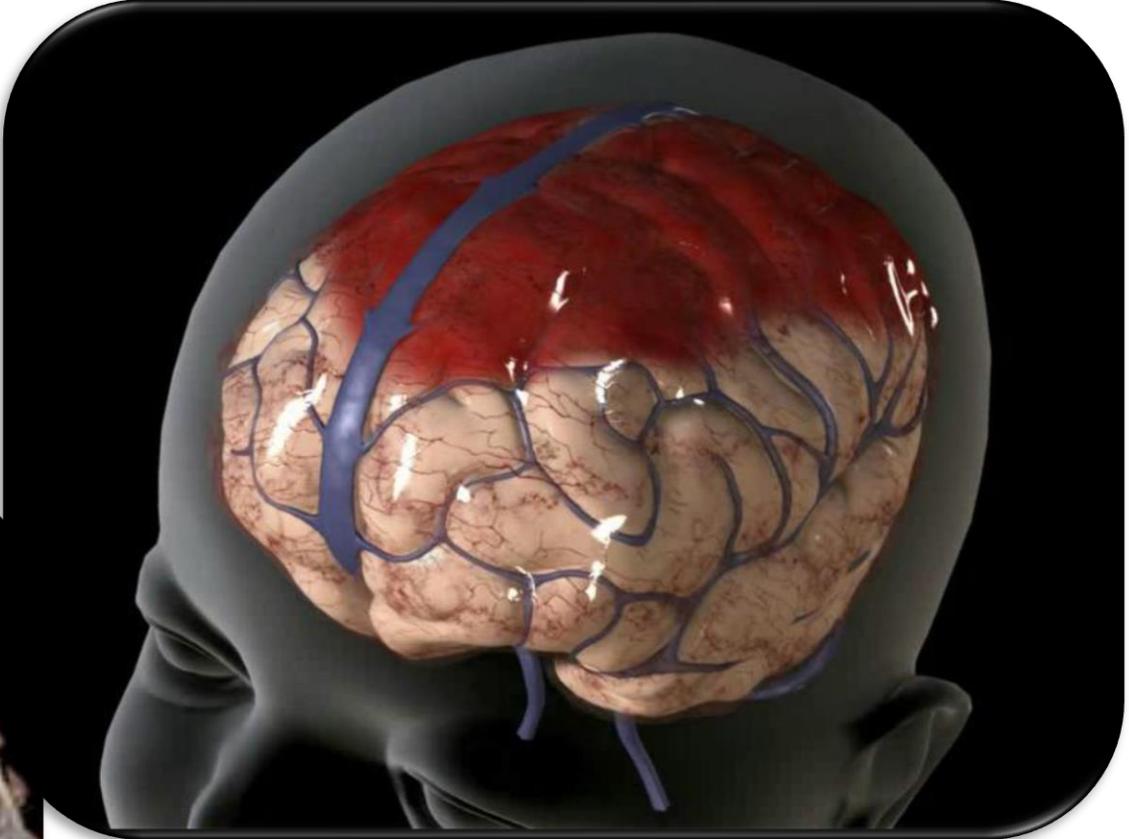


Polling Question #2





Subdural Hematoma

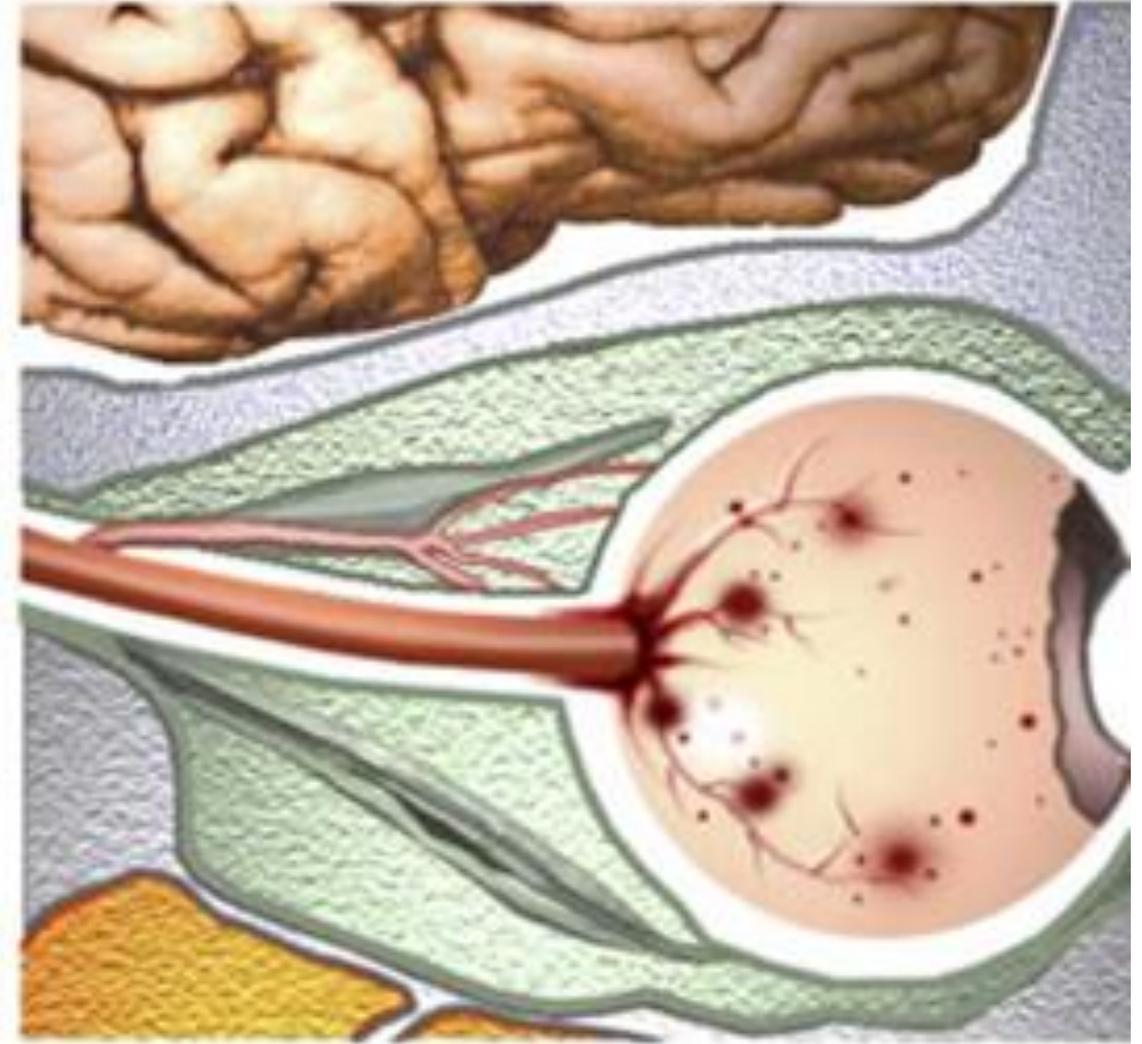


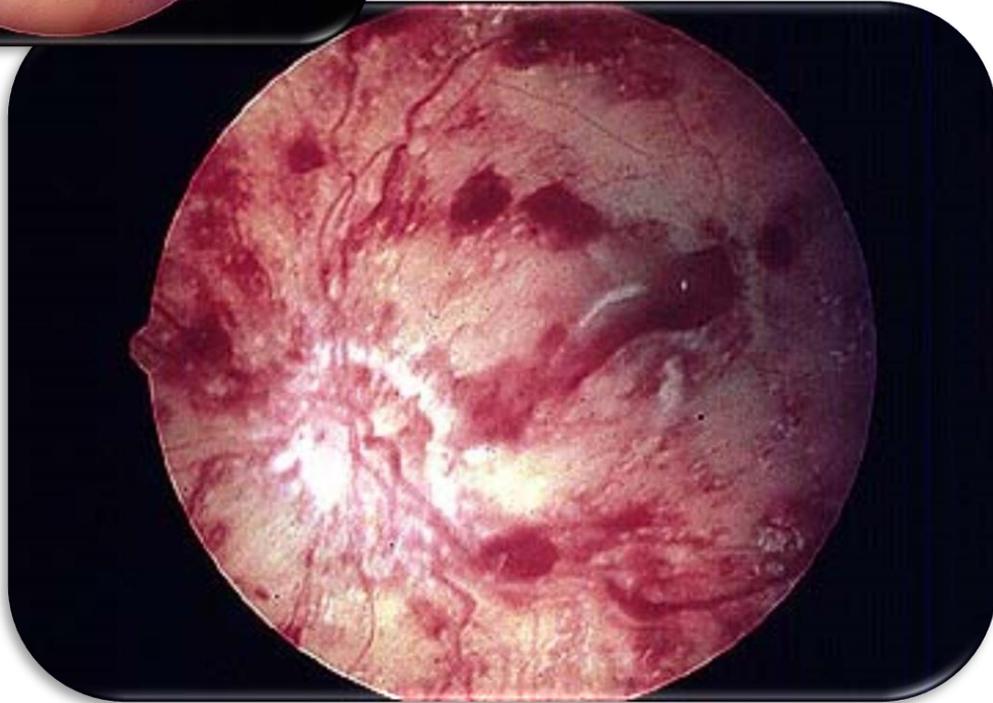


Polling Question #3

Retinal Hemorrhage

- Cardinal presentation of abusive head trauma
- 1971 – in literature
- Cannot date with precision
- Description:
 - Layers of the retina
 - Number and distribution





- 85% in shaking injuries
 - 5 – 10% accidental
- 2/3 are multi-layered and too numerous to count
- Associated with:
 - Severity of brain injury
 - Mortality



Rib Fractures

- Highly suggestive of abuse in patients < 2 yrs
- Lacking clear MOI, correlation of 70% for abuse
- Rib fractures after CPR are rare



Our Management -

- The Primary Goal
 - Prevent secondary brain injury by avoiding “H Bombs”
 - Hypoxia**
 - Hypotension**



Intubation?

- Hypoxemia is clearly related to poorer neurological outcomes in TBI
- There is no research to support ETI over bag-valve-mask
- If ETI is established, an end tidal CO₂ detector is necessary
- “Less than eight, intubate”



Hyperventilation?

- Decreases CO₂ – vasoconstricts
- Hyperventilation temporarily decreases ICP, but may increase ischemia
- Only if an immediate crisis!!

Big

$$70 + (2 \times \text{age in years})$$

- Hypotension should be identified in the TBI patient ASAP
- Definition of pediatric hypotension
< 5th % for age



On Admission to ER

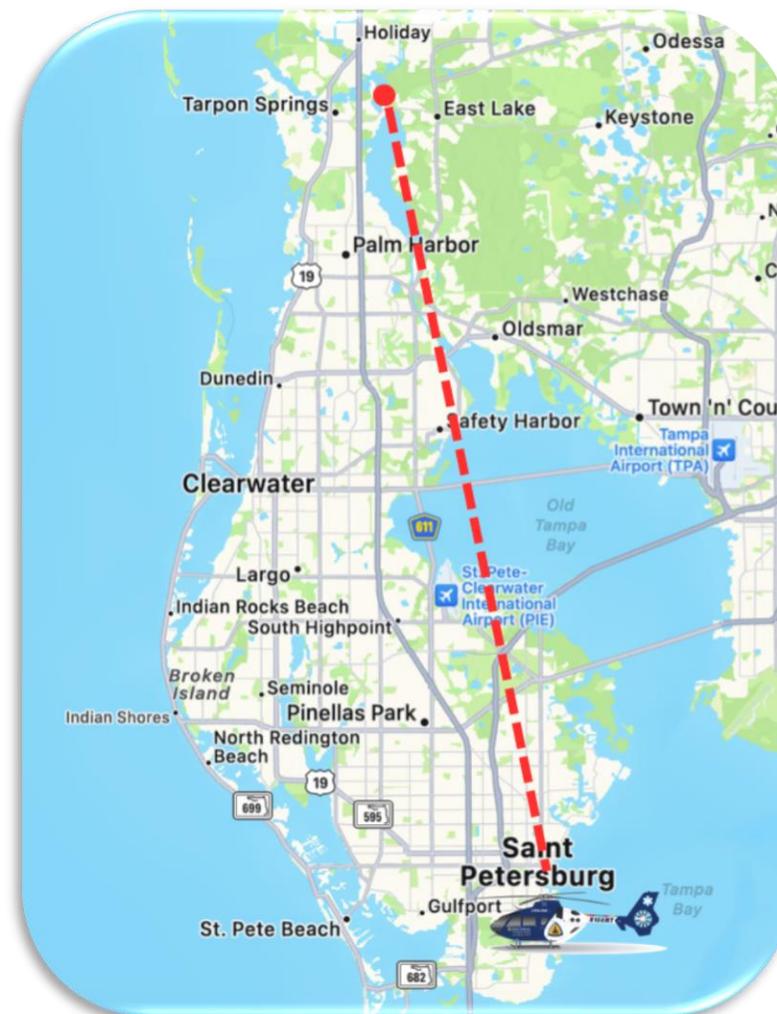
- Combined hypotension/hypoxia - - - dramatically increased mortality!
 - Two times greater than one or the other alone

Now This One is Scary! #2



You Have Been Dispatched...

February 22, 2022, call received at approximately 12:30



Response

- En route FD advises that the patient was a "19-month-old male with a stab wound to the head".
 - Could hear the pt screaming in the background of the radio
- En route CRM/discussion





What's the Situation?

- Toddler seated with firefighter attempting to stabilize a knife lodged in the patient's head
- Six providers in the back of the truck, father at stretcher
- What's the Story here???????????

Disability

Exposure

- **Disability**
 - GCS - 15
 - 3 equal/reactive
- **Exposure**
 - *Pt was found with a kitchen knife entering through the R ear lobe obviously penetrating the cranium*
 - Completely Undress!





Plan of Care

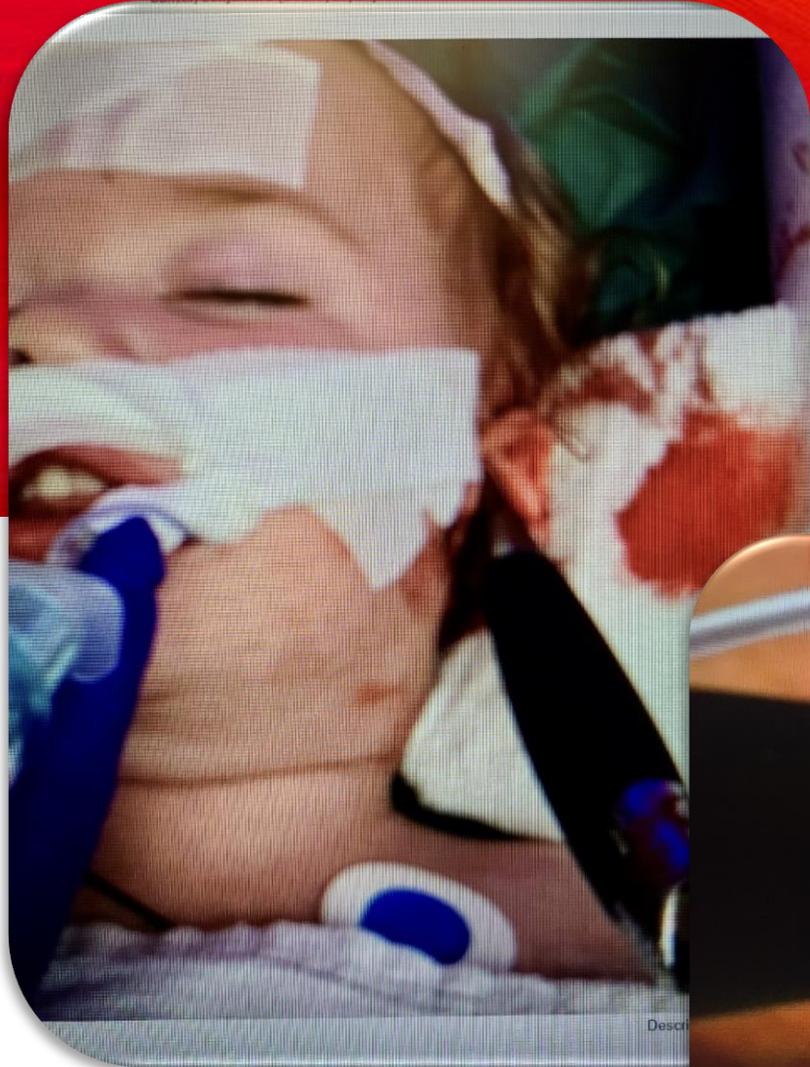
- Risk of Movement/? ICP – let's sedate!
 - Ketamine IM x 2 – nothing so far
- Elective Intubation
 - More Ketamine, Fentanyl, Rocuronium



Transport Considerations

- We are intubated, sedated, paralyzed
 - How to secure the knife
 - Facilitating movement of the patient
 - Can Dad go with us?

Transport Considerations



- *Hypoxia*
- *Hypotension*
- *Pain Control*

On arrival to hospital



Pt became hypotensive

1-unit PRBC and NS
resolved hypotension

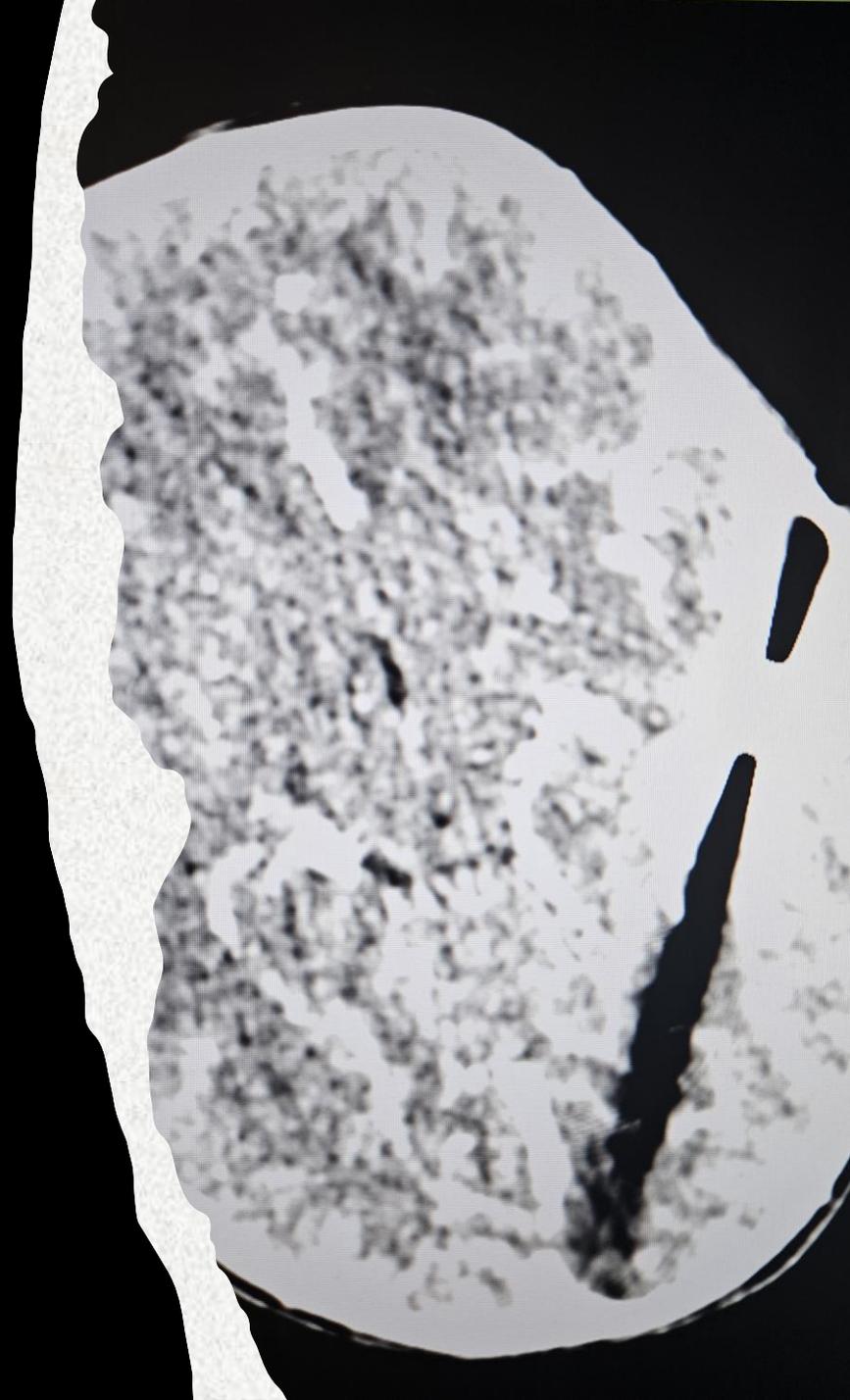
Still tachycardic

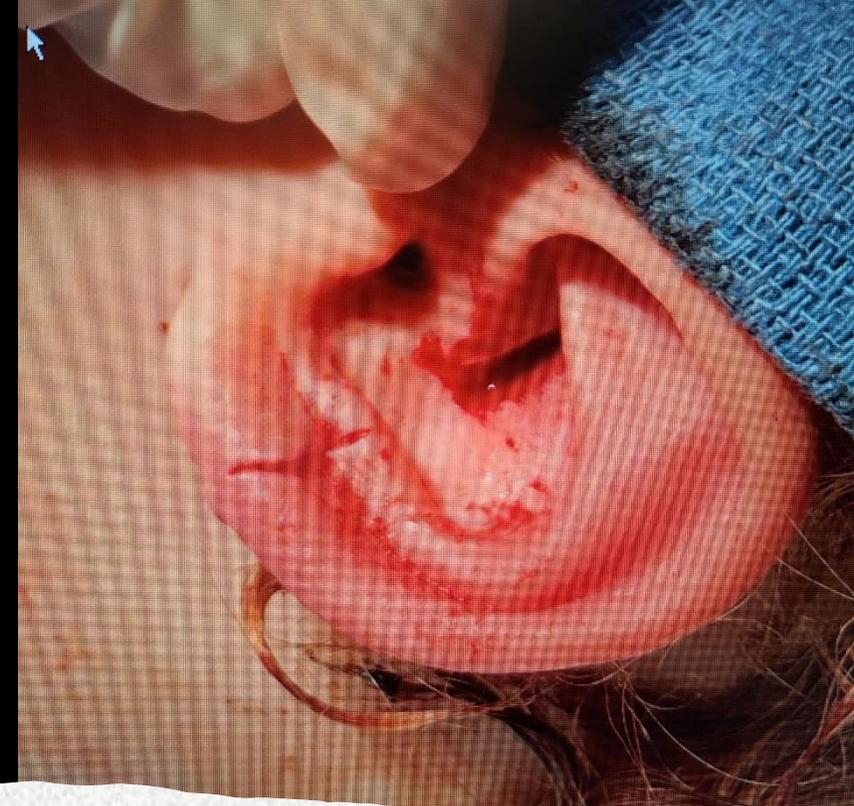
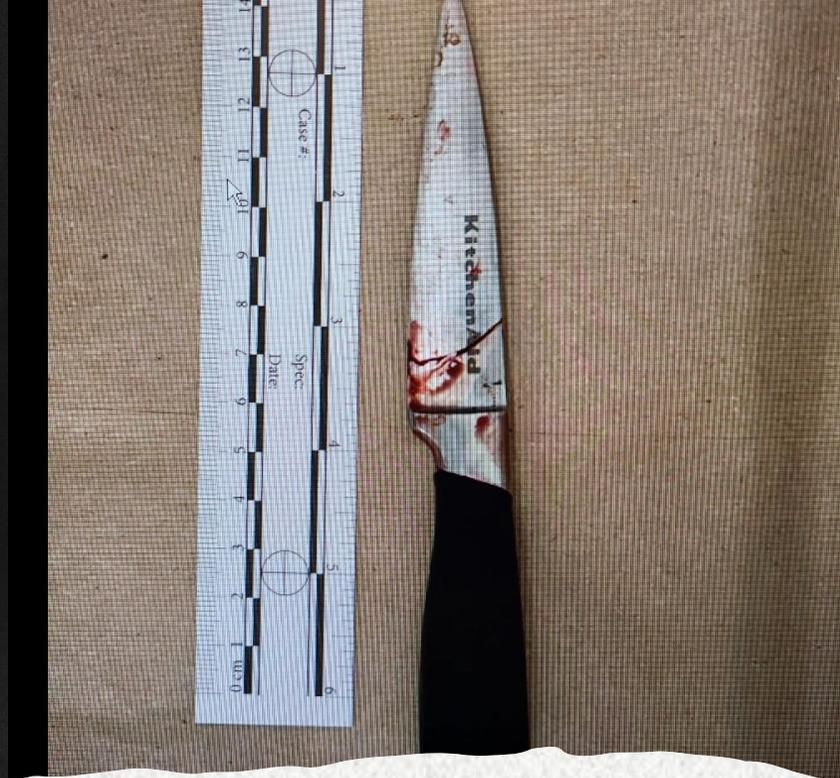
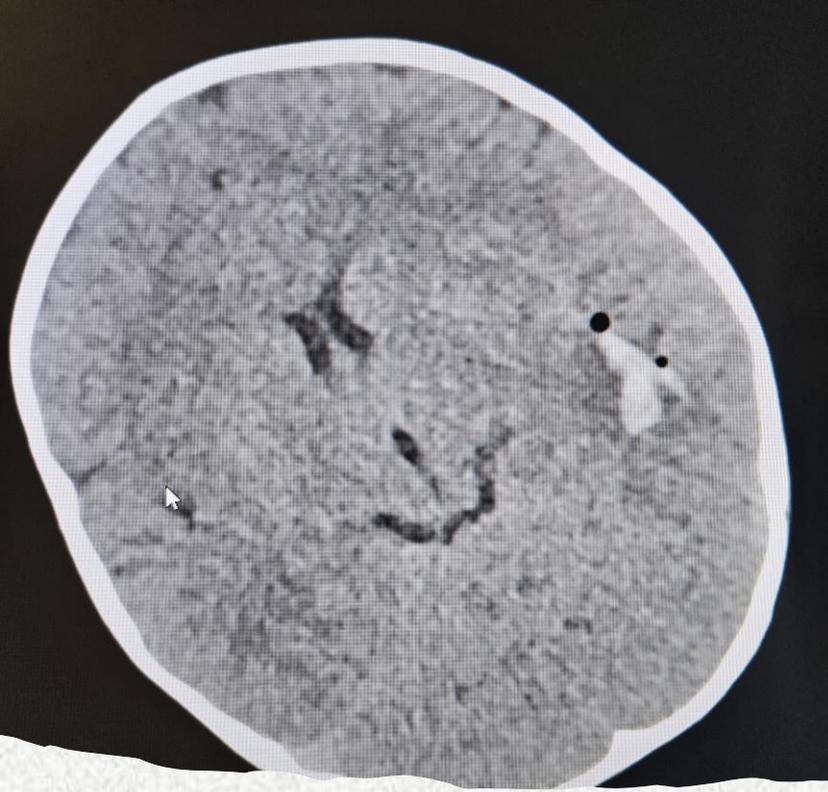


**Pt taken to CT after initial
stabilization**



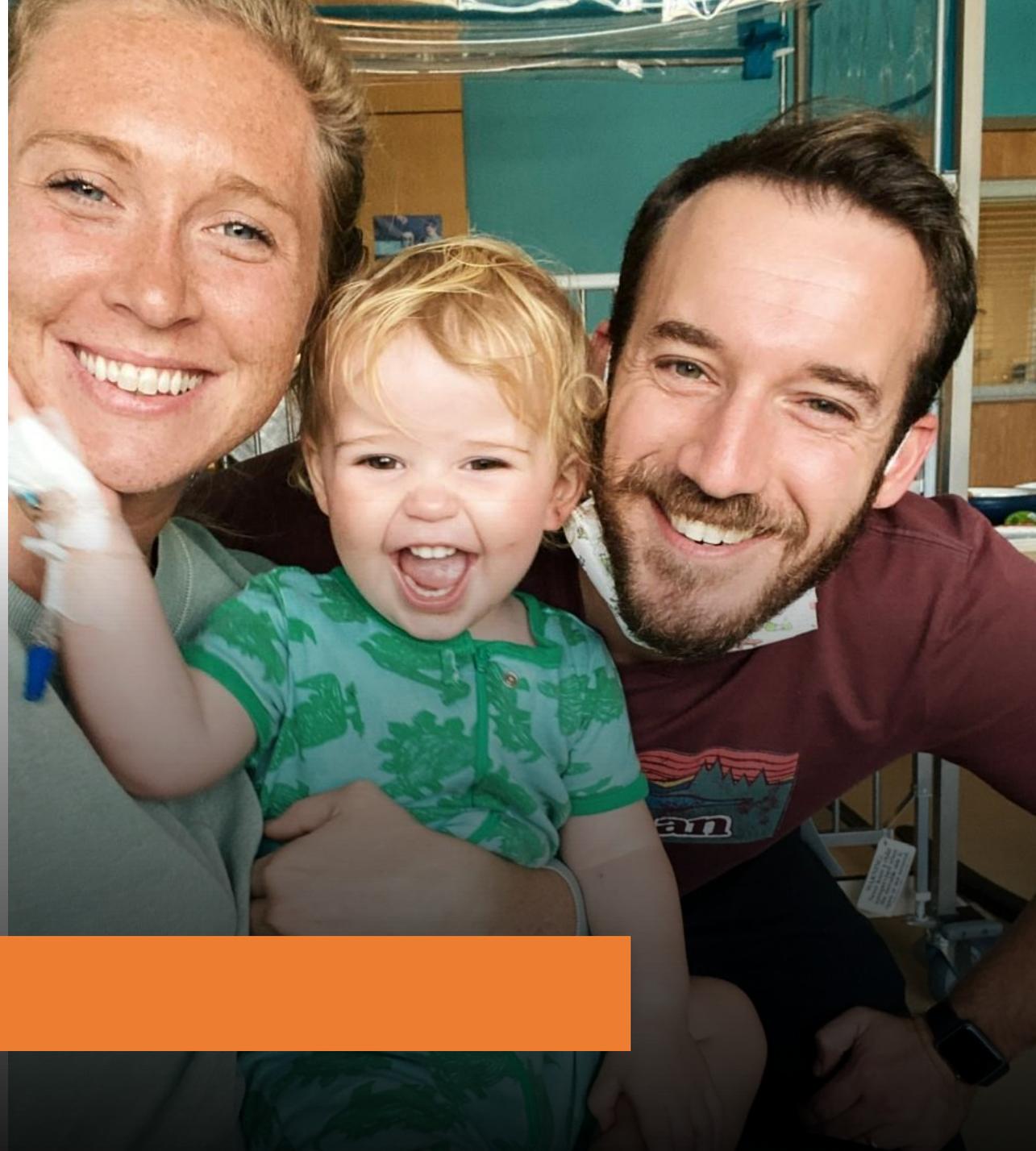
X-ray
CT angiogram
(no obvious arterial
extravasation)





Treatment now?
Only if you are a neurosurgeon!

2 days later...



Thanks for
Taking
Great Care
of our
Precious
Trolls!

