

I Think It's Abuse: Now What Do I Do?! Updates on Evaluation of Child Abuse

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The Kempe Center
FOR THE PREVENTION AND TREATMENT
OF CHILD ABUSE AND NEGLECT



University of Colorado
Anschutz Medical Campus



Children's Hospital Color

Case Study

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Case Presentation

CC: vomiting

ex 36-week preemie, 78-day old twin male

- No fevers. No diarrhea.
- Worsening vomiting, now projectile
- NI VS, weight, exam

DDx: overfeeding, reflux, pyloric stenosis

ED Course: Pyloric US – negative

Fed well in ED with spit up but no emesis

Discharged home



Case Presentation

1 week later follow up seen by PCP.

- Ongoing “spitting up, worse over past 2 weeks”
 - Weight gain substandard
- Bruise noted on belly, photo on cell phone
 - PCP questions car seat as cause



Red Flags????

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Case Presentation

10 days later ER visit for ALTE, vomiting and fussiness

VS ok but weight down

CBC: WBC 6.57, HGB 9.4 ,PLT 309

Repeat u/s for pyloric stenosis

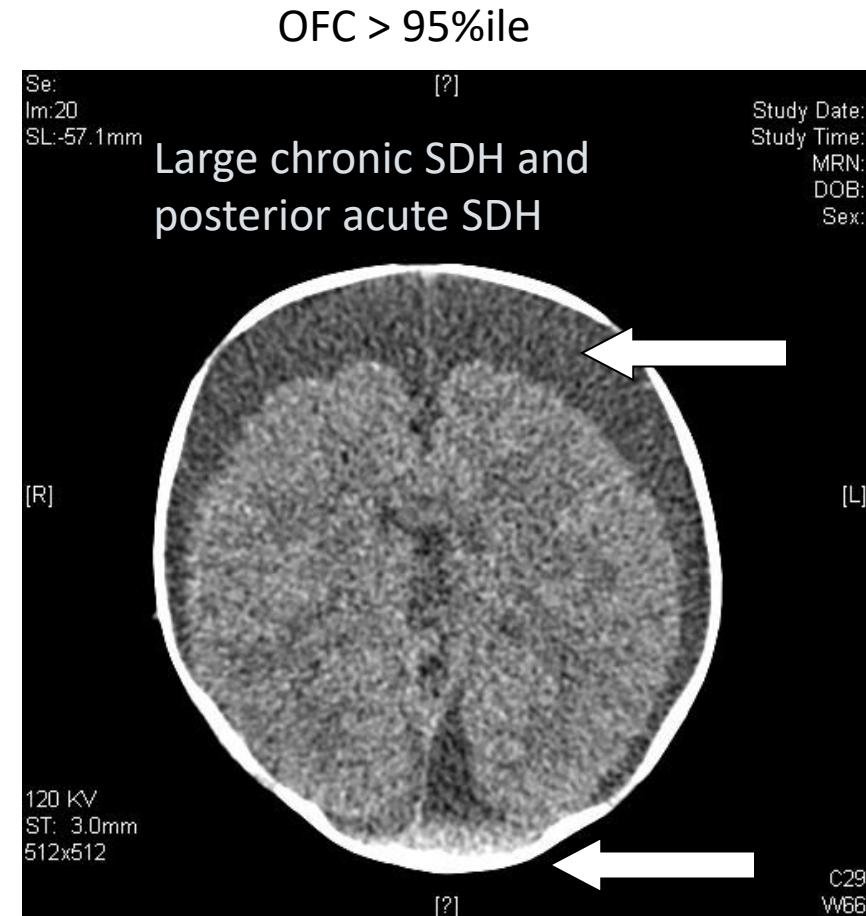
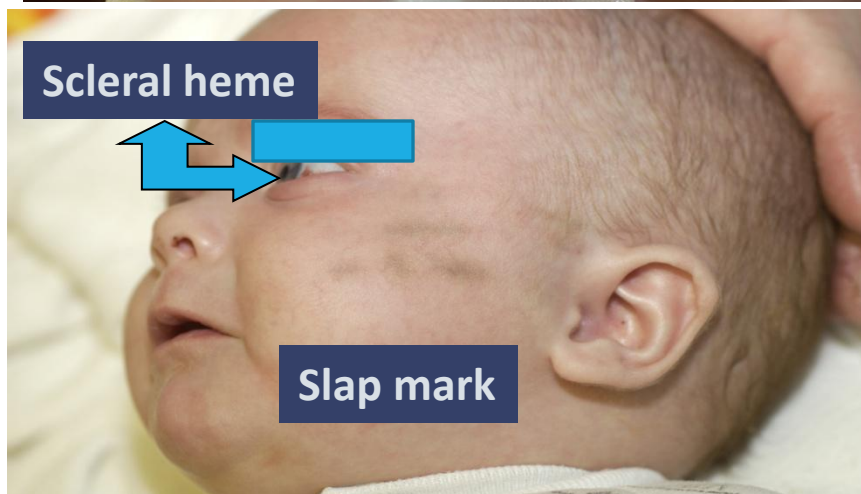
Dx - ALTE related to choking from spitting up

Red Flags???

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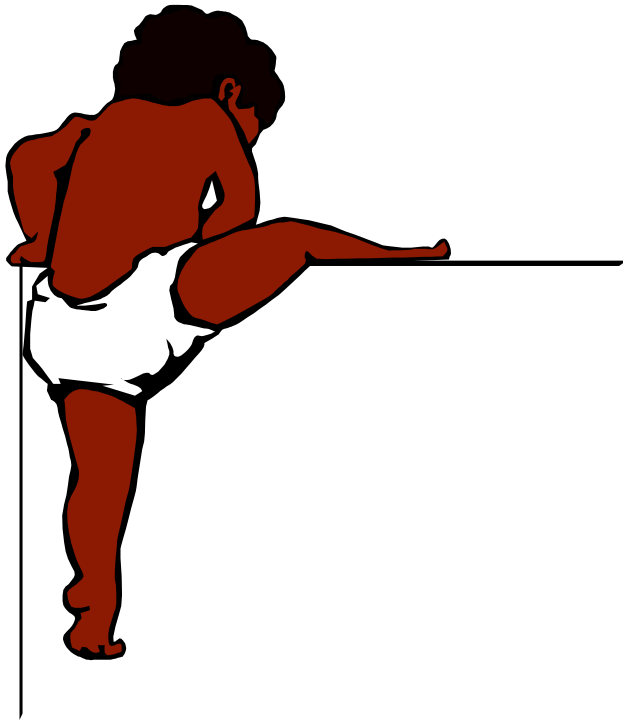


Last ER visit: Unifying Diagnosis of Child Abuse



Infant with bruising is a child abuse medical emergency!

Physical Abuse -- diagnosis



Do the facts as given in the history, correlate with the following:

- severity of the injury?
- age of the injury?
- location of the injury?
- pattern of the injury?
- developmental age of the child?

Accidental Bruises: Bump, Fall, and Play



BRUISES: High Risk, Sentinel and Serious



BRUISES: High Risk, Sentinel and Serious



BRUISES: High Risk, Sentinel and Serious



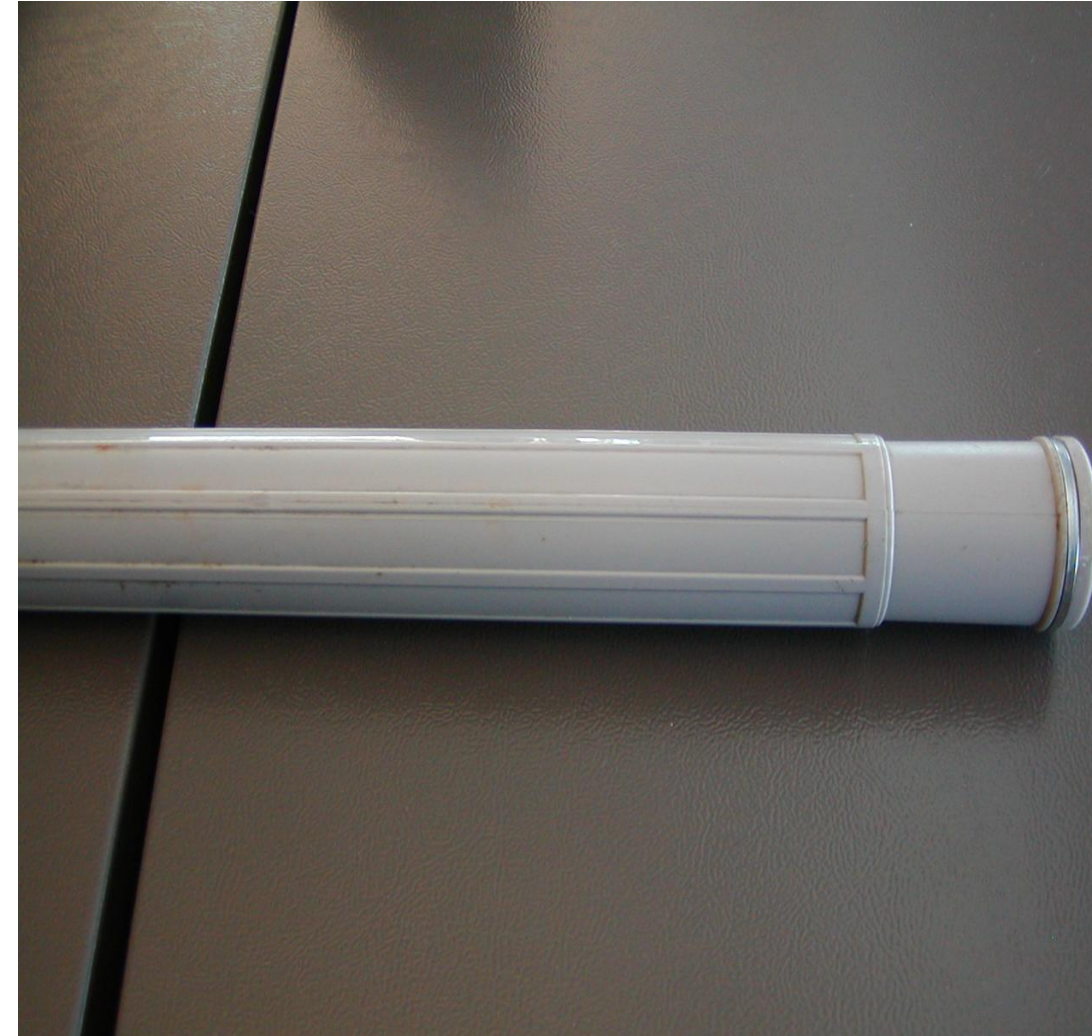
Abusive Bruises: Protected Soft Areas



Patterns: Common, Clear, and Unclear



Explained Pattern: Jealous older sibling



Patterns: Uncommon and Less Clear





Bites



Bites: Arms, Legs and hidden places



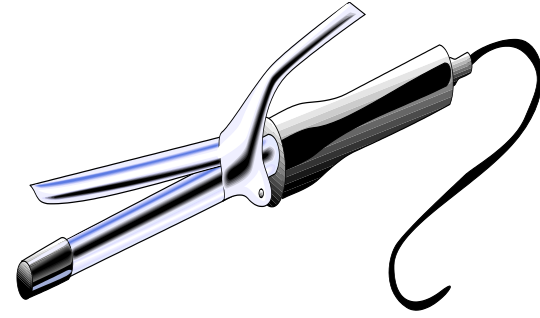
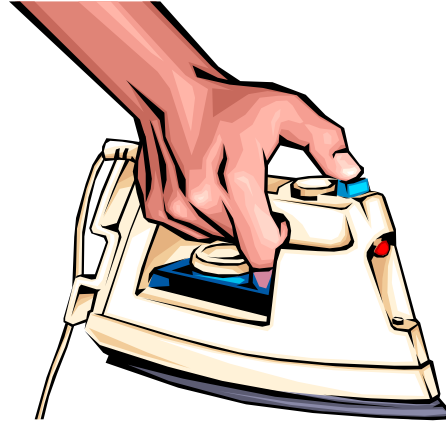
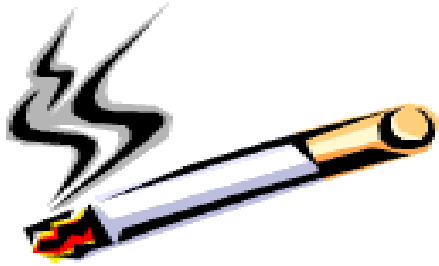
BURNS



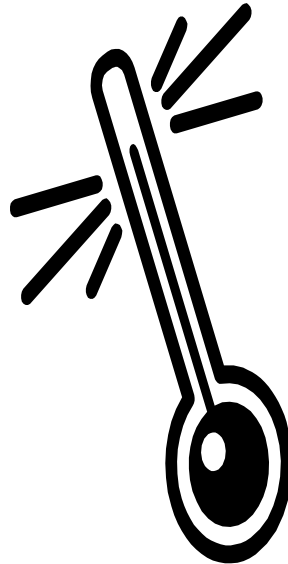
Caution
**Very hot
water**

MARGRET & H.A. REY'S
Curious George
and the Firefighters





Burns



Burns

Patterns

History!

Scene investigation critical!

Degree of burn a factor of :

- skin thickness,

- Temperature

- Solid/liquid/gas

- length of contact

Perineum and extremities are most common areas of abusive burns

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Burn Classification

First Degree	Superficial Partial-Thickness	Epidermal layer damage only (local redness)
Second Degree	Superficial to Deep Partial-Thickness	Dermal layer damage (blistering to scarring)
Third Degree	Full Thickness	Subcutaneous layer damage
Fourth Degree	Full Thickness	Muscle, fat, burn layer damage



Temperature vs Time

Water Temperature	Time to partial- and full-thickness burns
111.2 °F	~6 hours (superficial)
130 °F	10 sec
135 °F	4 sec
140 °F	1 sec
149 °F	0.5 sec



History Regarding Burn Injuries

Anatomic location

Explanation of the injury

Location of child

Witnesses to injury?

Child and caregiver's reaction to injury

Prior injuries?

Source of injury

Date/time of injury

Presence/absence of clothing

Time from injury to presentation for care

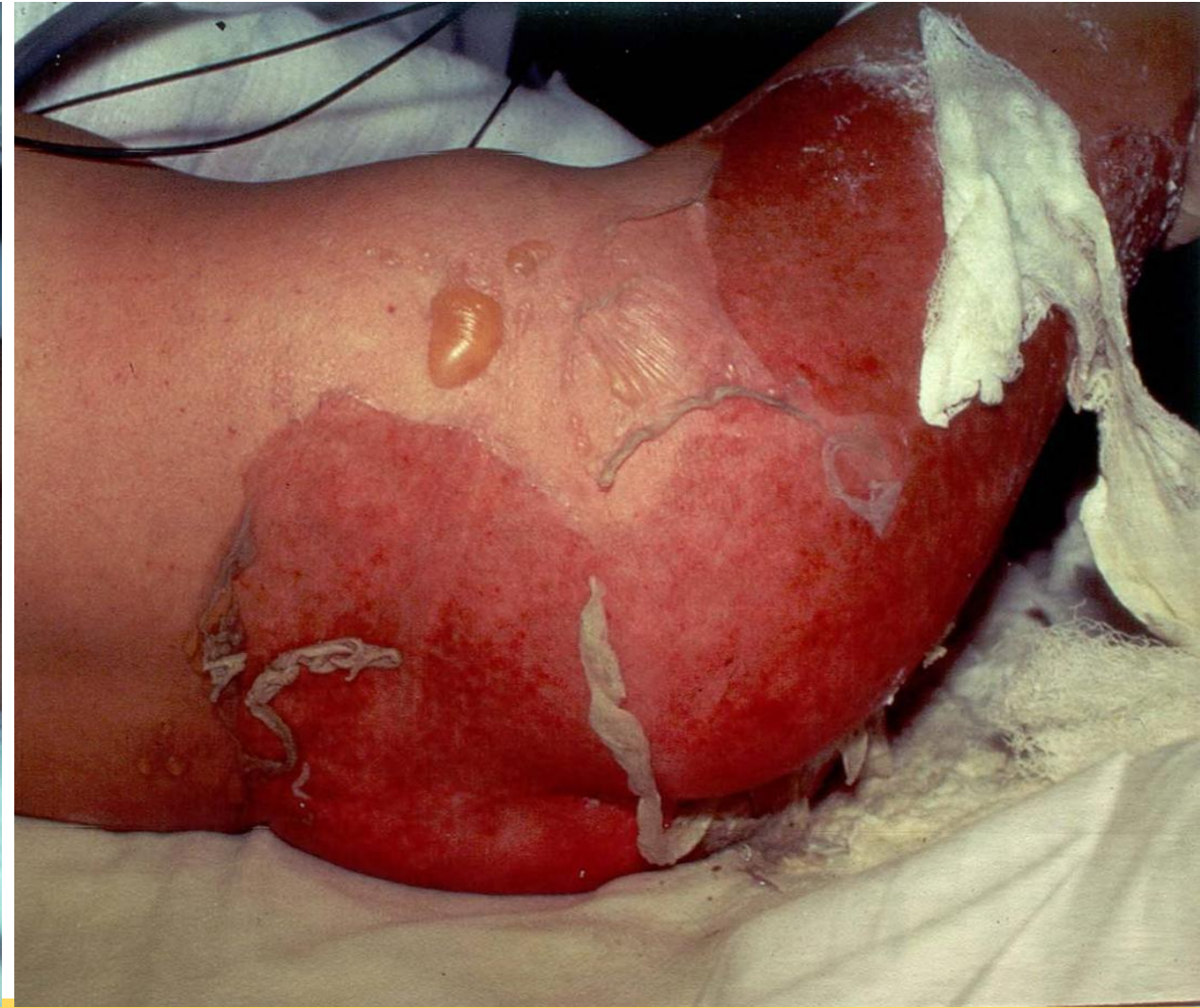
Developmental level of child



Babies & bathwater. Toddlers & teacups.



Burns: Classic Immersion examples



Burns: Hand and Feet



Burn Patterns



Burn Patterns





Viceroy Butterfly (mimic)



Monarch Butterfly

MIMICS

Bruises, Burns and Fractures

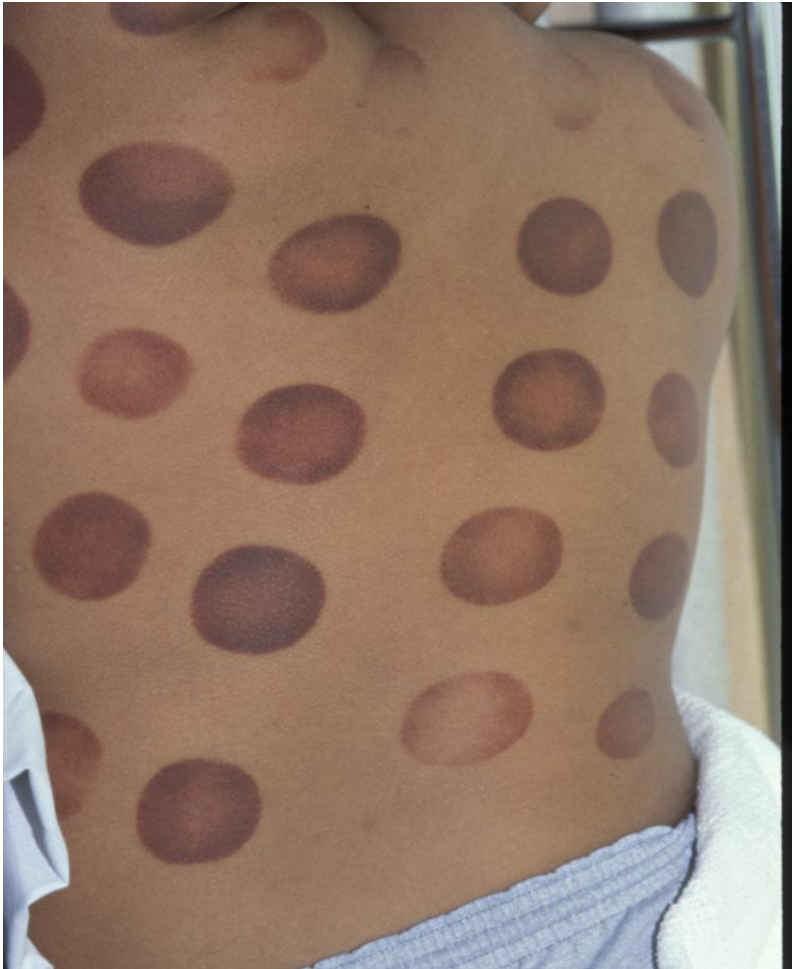
Bruising and Burn Mimics

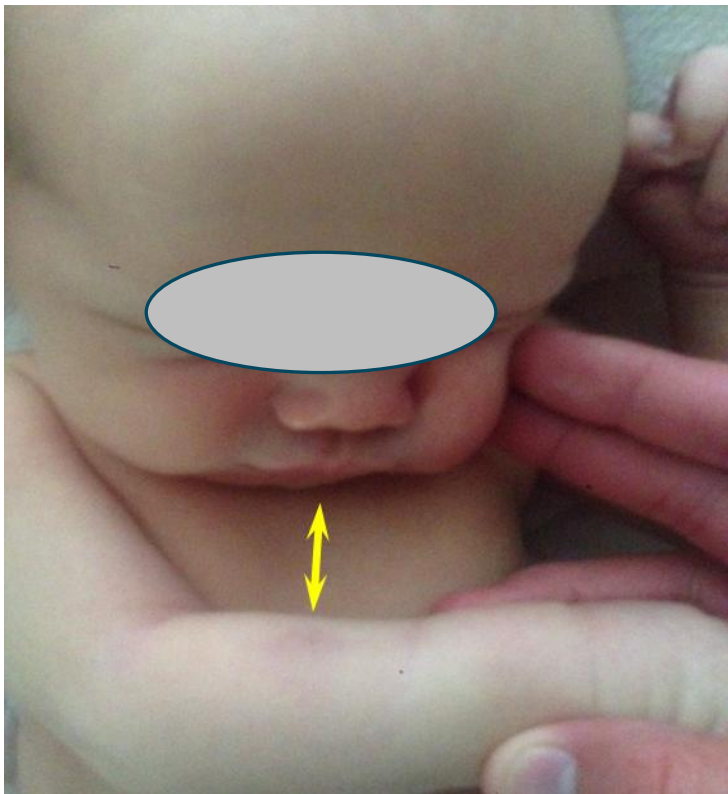


Bruising and Burn Mimics



Mimics: Cultural Practices





Bruising Mimics: Cute

Fractures

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Fractures: Practical Pointers

- Biomechanics
- Development and mobility
- Common accidents
- Absence of bruising is common
- Symptoms sometimes help with timing
- X-rays sometimes help with timing



Specificity of Fractures

High Specificity for Abuse

Posterior rib fractures

Metaphyseal lesions

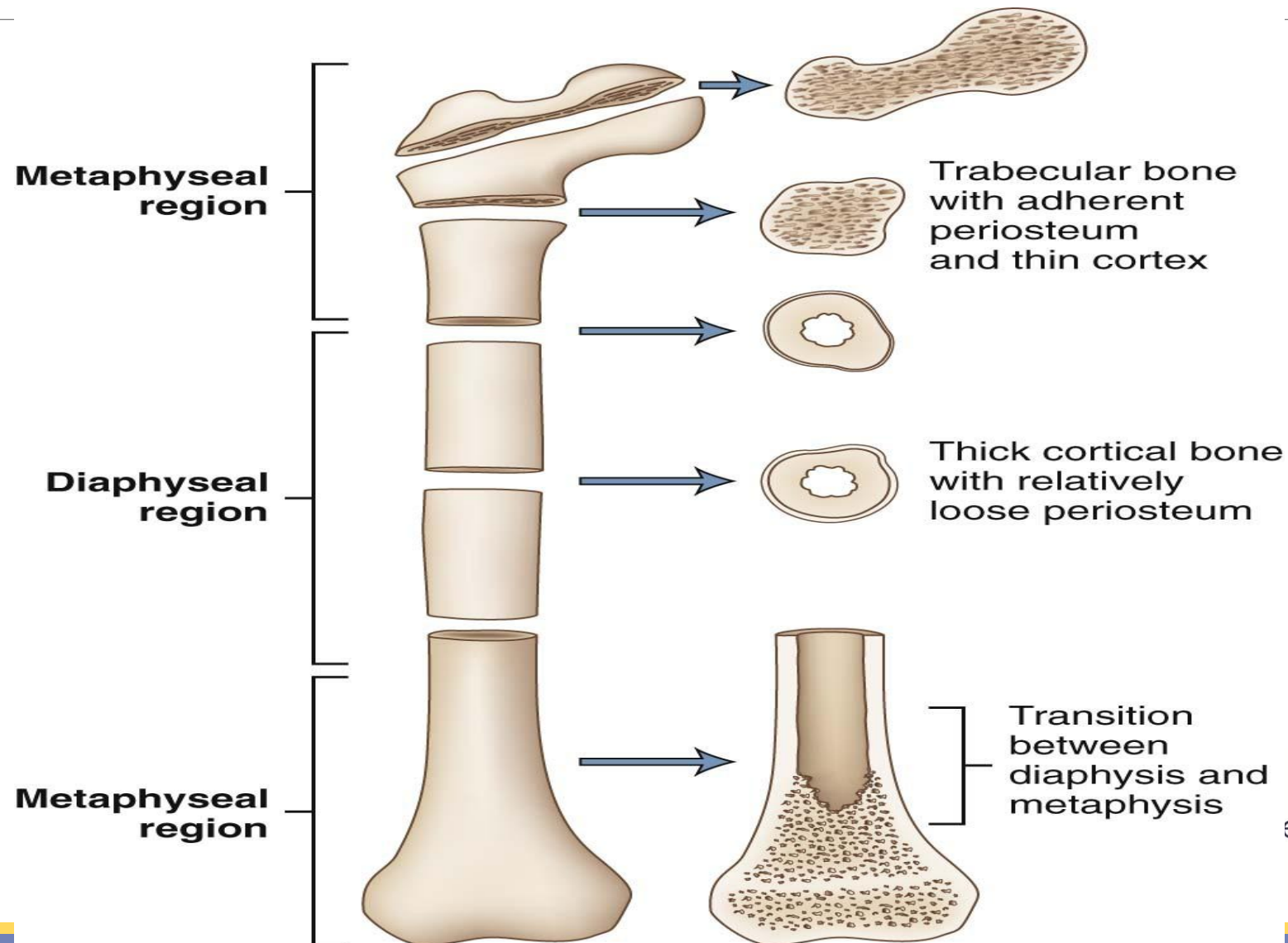
Scapular fractures

Spinous process fractures

Sternal fractures

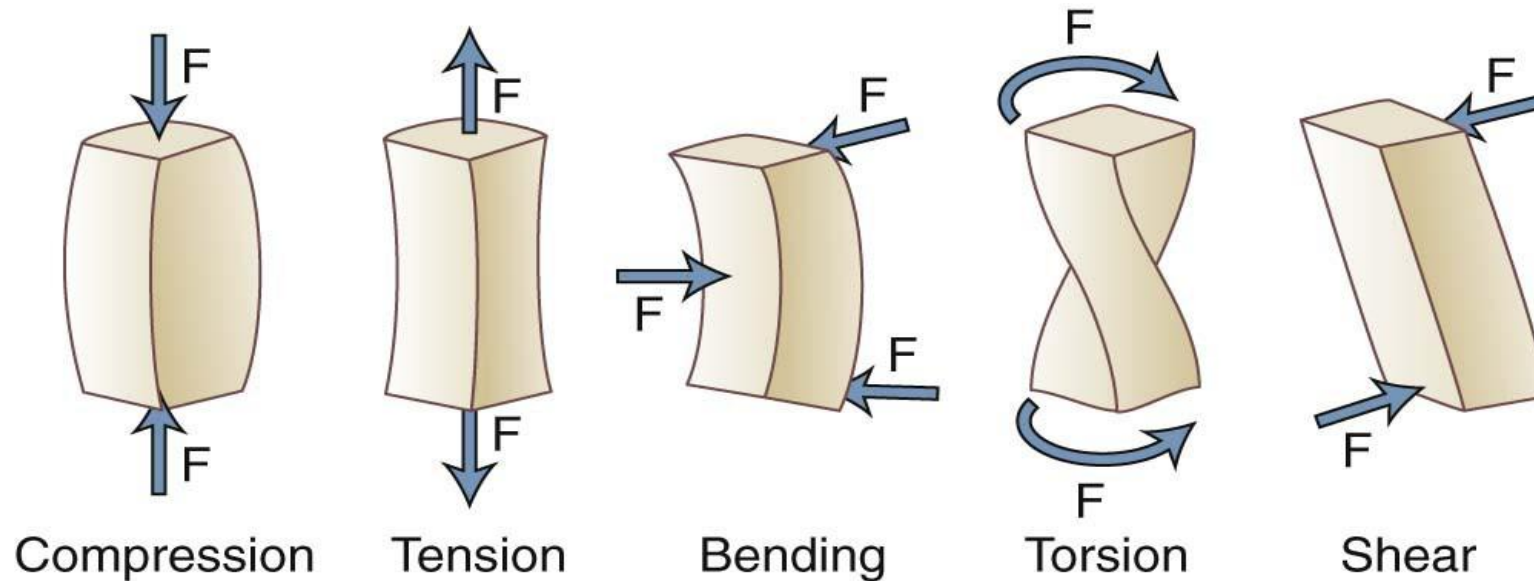


Bone Anatomy 101: Injury Sites



Injury Mechanism –

Force Directions (F) Dictate the Type of Fracture



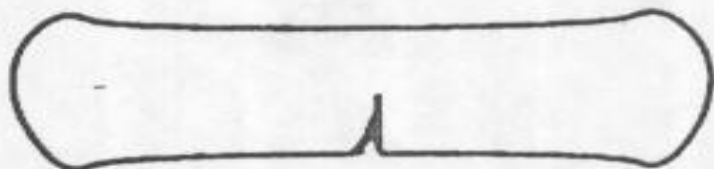
Forces cannot be quantified: i.e. ‘how much force needed to cause what type of fracture’

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Biomechanical Conditions and Fracture Types

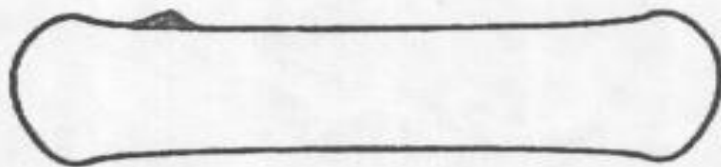
Biomechanical Conditions	Fracture Types
Torsional loading	Spiral/long oblique
Bending load	Transverse/short oblique
Compressive loading	Buckle/impaction
Tension and/or shear loading	Classic metaphyseal lesion
High-energy event	Open and/or comminuted



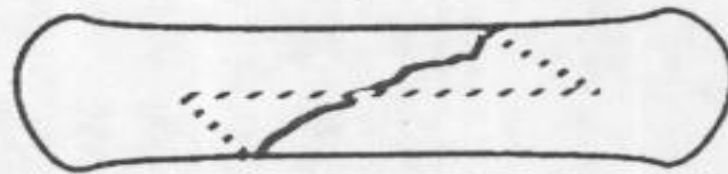
"GREENSTICK" FRACTURE



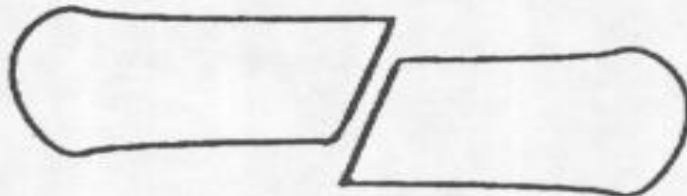
TRANSVERSE FRACTURE
with angulation



"BUCKLE" FRACTURE



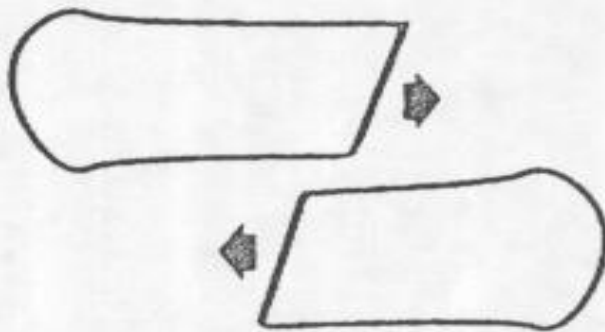
SPIRAL FRACTURE



"BAYONET" APPPOSITION



OBLIQUE FRACTURE



"OVERRIDING" POSITION
WITH SHORTENING



COMMINUTED FRACTURE



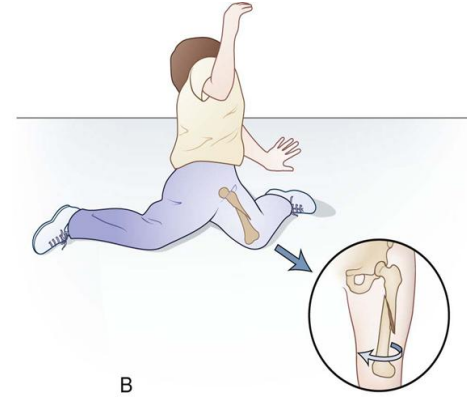
"BUTTERFLY" FRAGMENT

Torsional Load -- Spiral Fracture of Femur

2 1/2-year-old with history of running, tripped over object, fell with leg twisted outward

20-month-old playing with sibling in bed, got leg twisted in blanket, fell with leg tangled in blanket

2-month-old with acute swelling of leg after a diaper change



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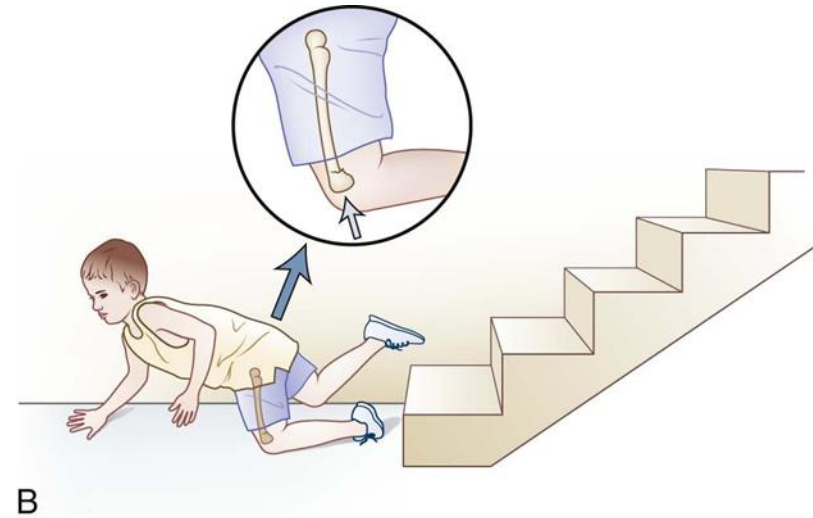


Compression / Axial Loading -- Transverse Femur Fracture

9 month old crawls
off of the bed and
lands on knee



Acute, transverse, distal meta-
diaphysis femur fracture

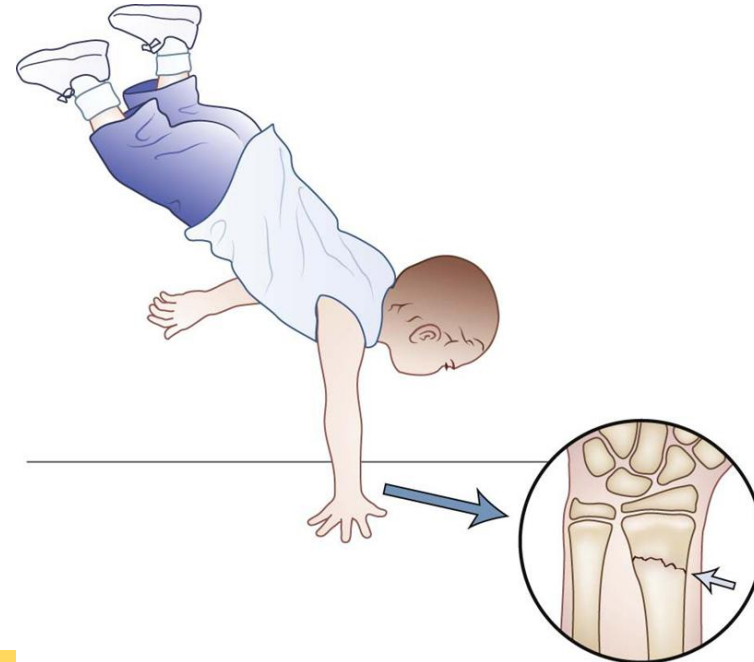


Axial Load – Distal Long Bone Fractures

15 month presents with a limp. Her Johnny Jump up is too long



3 year old falls at playground



mpc Center



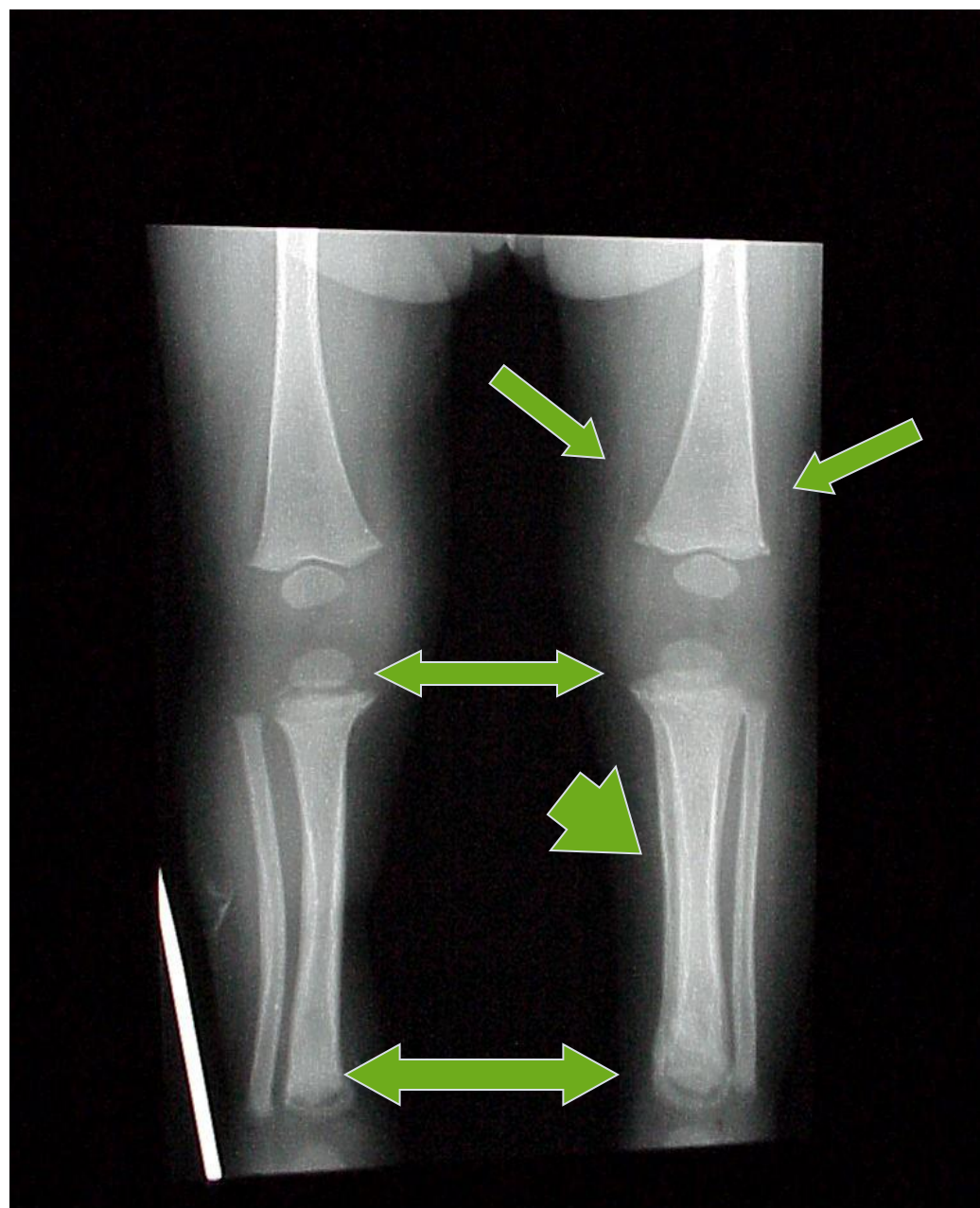
Classic Metaphyseal Lesion and Bucket Handle



Diagnostic Imaging of Child
Abuse – Paul Kleinman

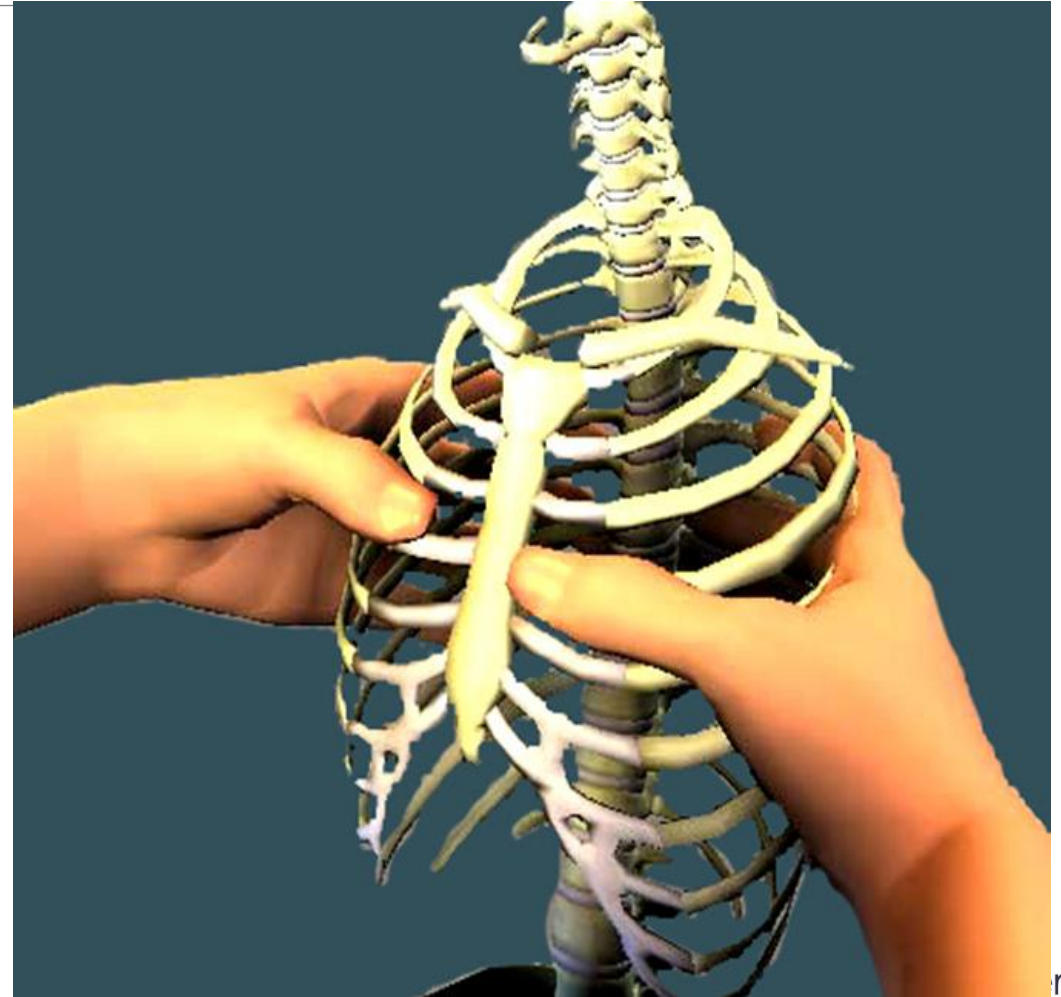
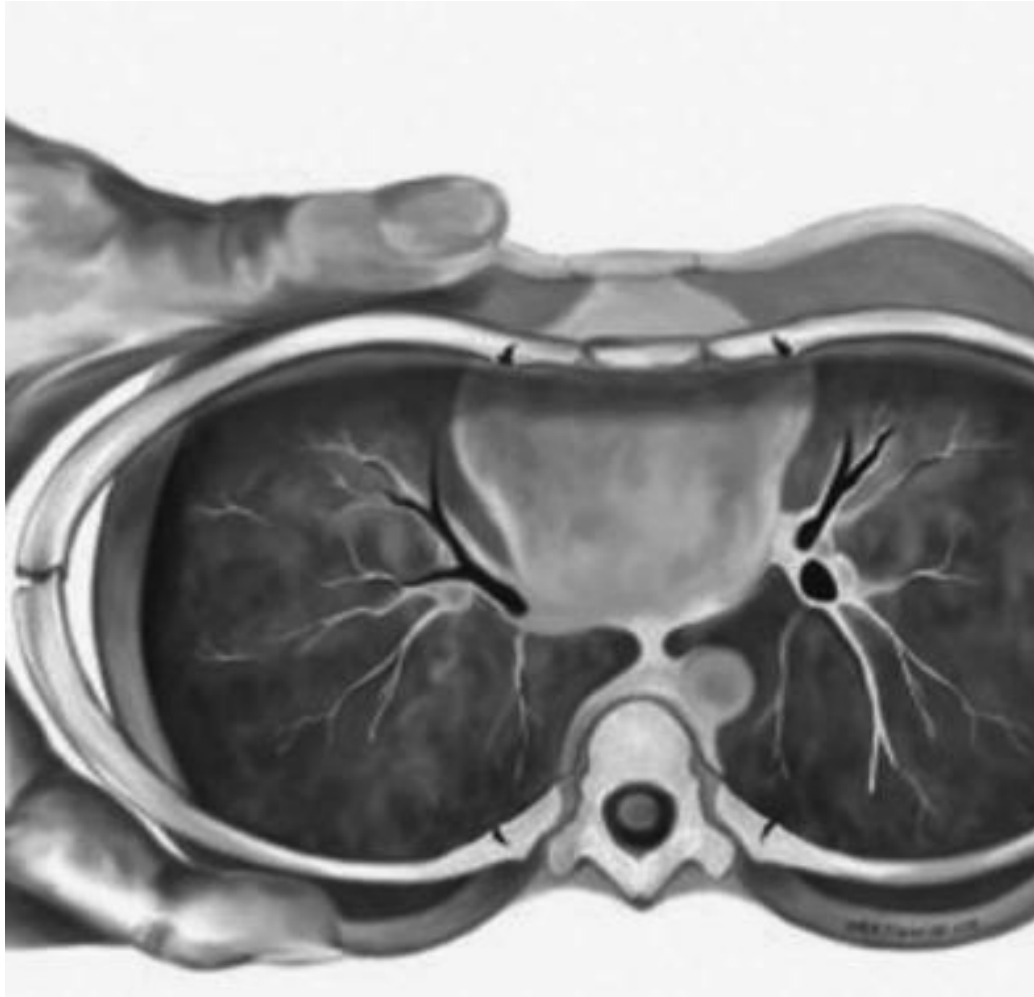
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**Healing Bucket Handles and
Periosteal Elevation**

Rib Fractures



Se:
Im:1

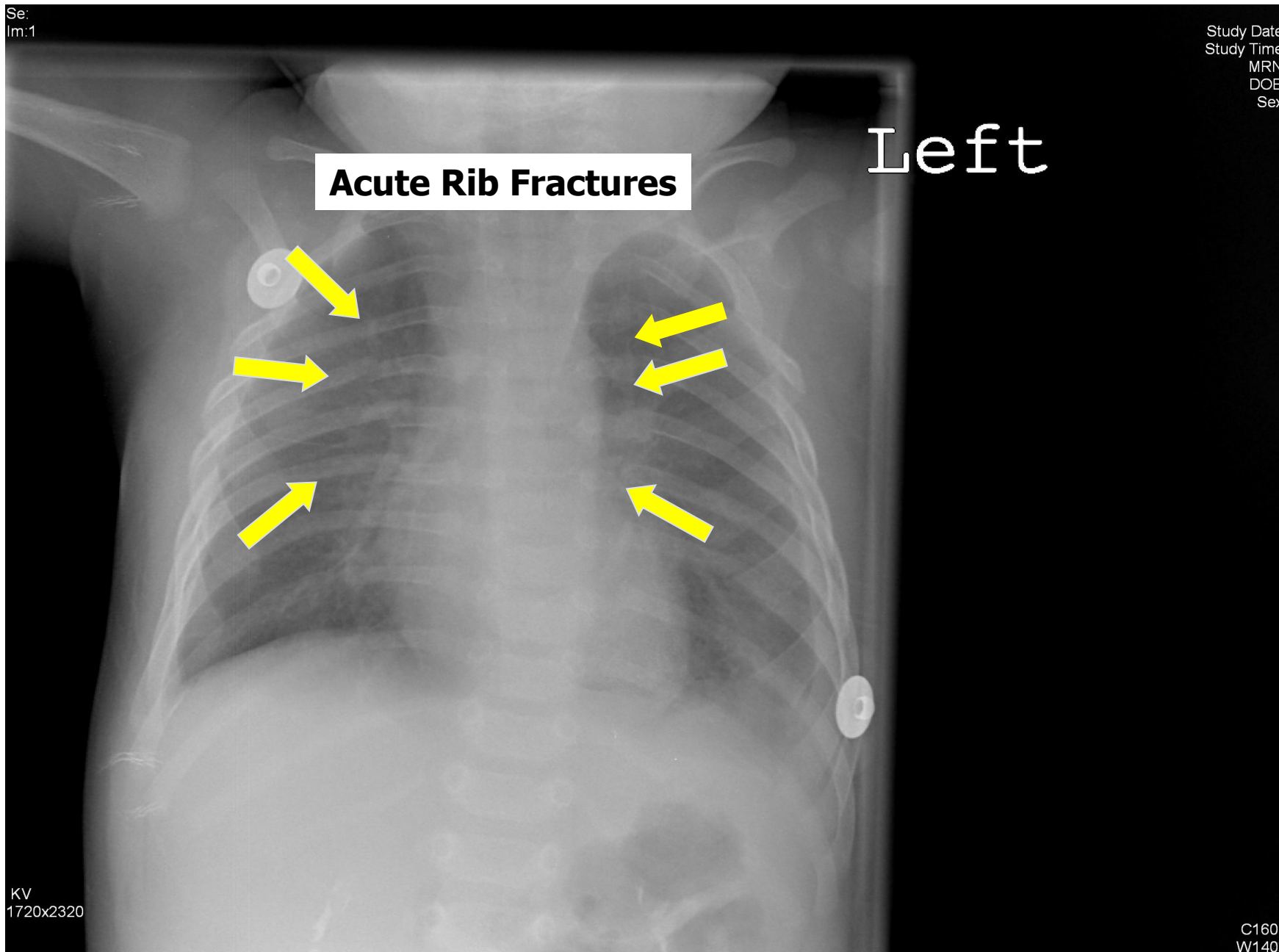
Study Date:
Study Time:
MRN:
DOB:
Sex:

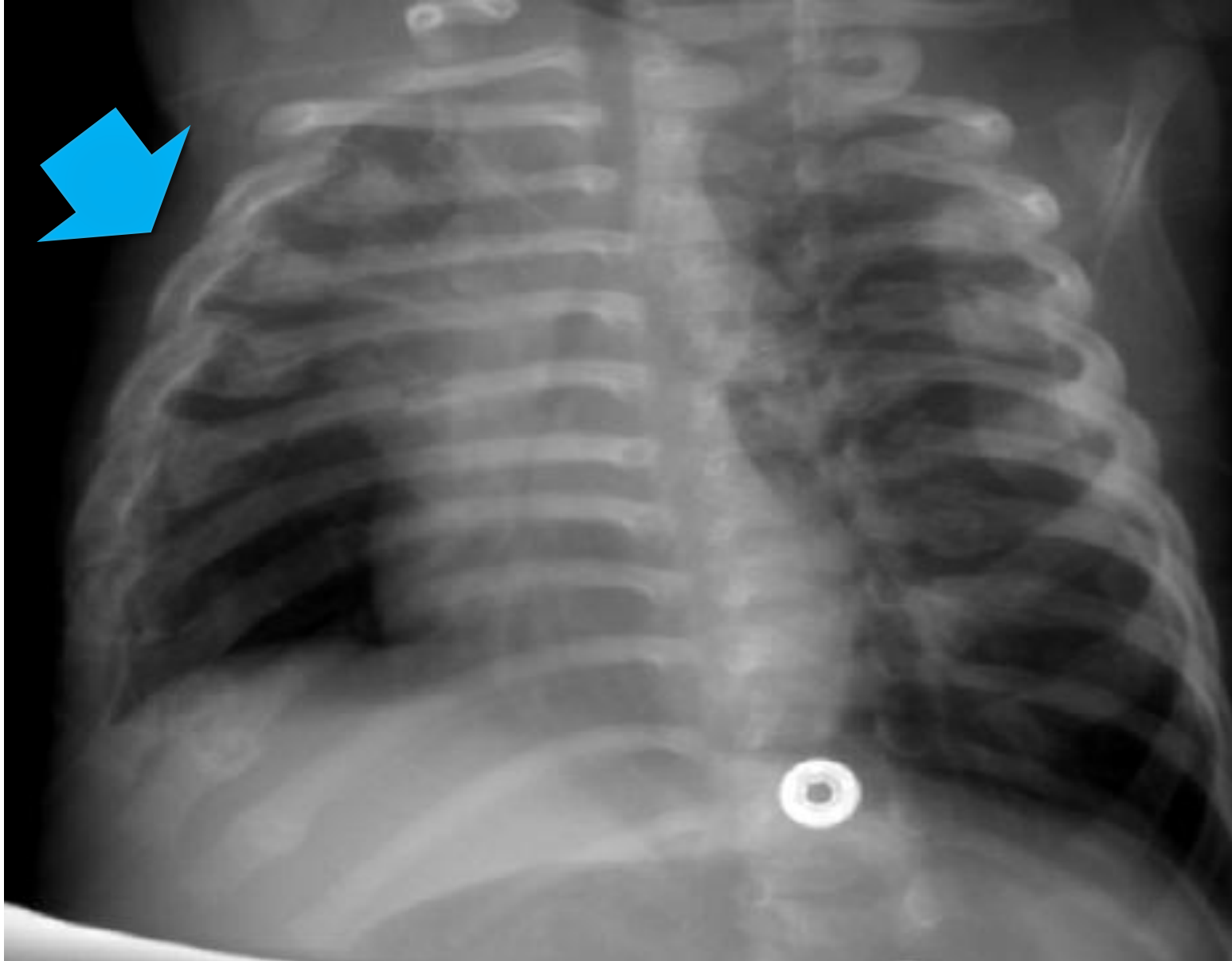
Acute Rib Fractures

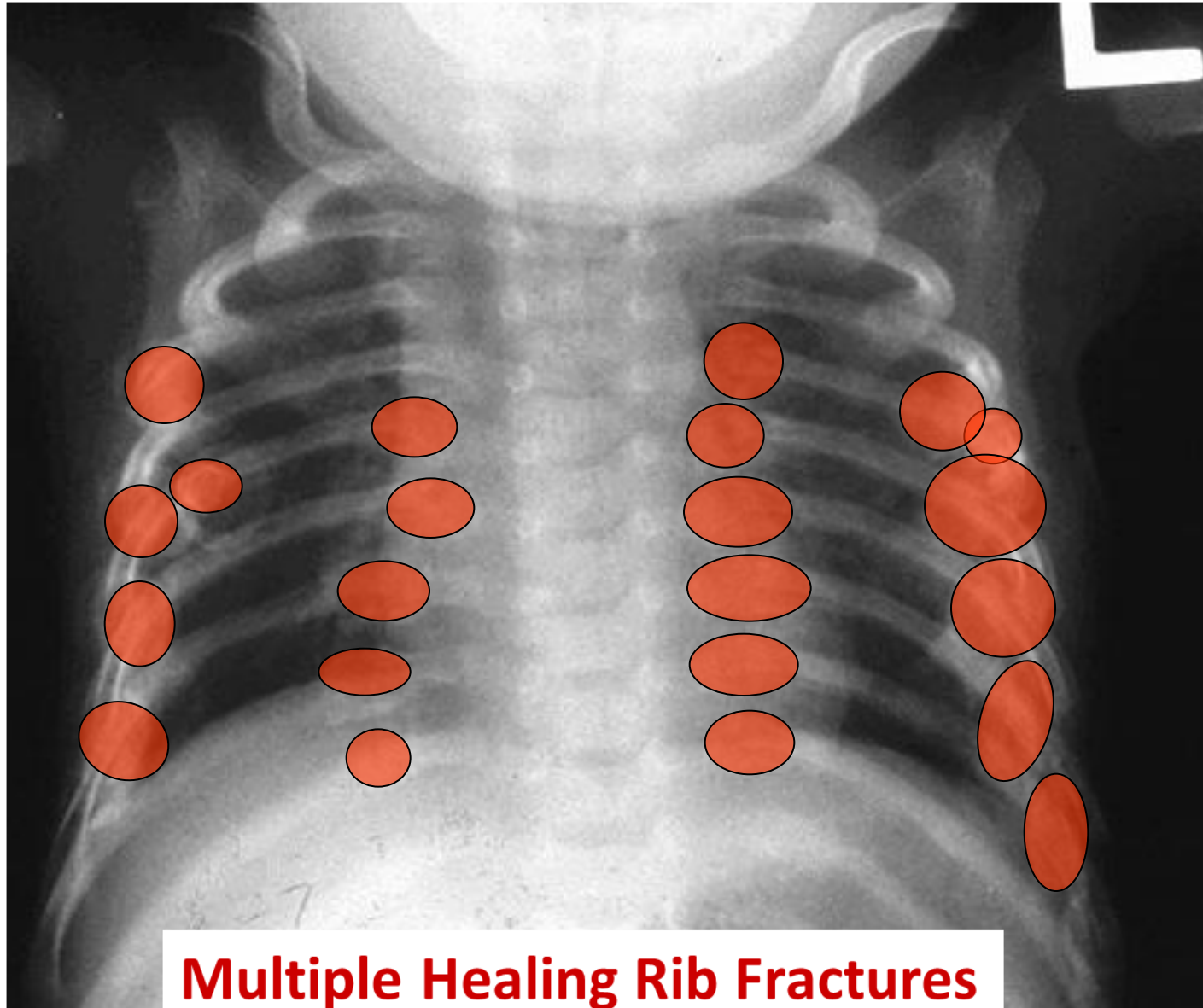
Left

KV
1720x2320

C1603
W1408







Multiple Fractures in Infancy & Childhood



Summary Thoughts

- Keep abuse on your differential.
- Keep it objective – “Does the history fit for this injury?”
- Standardize your occult injury screening.
- Be clear about your clinical decision making.
- Complete mandatory reporting duties if necessary.



THANK YOU!

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