Injury Assessment- When to be Concerned

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child health

Outline

- Tools- Injury Assessment
- Cases Examples for Discussion
- What to do when concerned
  - Interaction with CYF

Injury Assessment

To establish if history adequately explains the injury

Detailed history

When did the injury occur?
Where did the injury occur?
Were witnesses present?
What was the child doing when injured?
What is the child's previous injury history?
What is the child's current developmental capacity?
Was the child being adequately supervised at the time of the injury?

Examination Extent of injury / Injury description

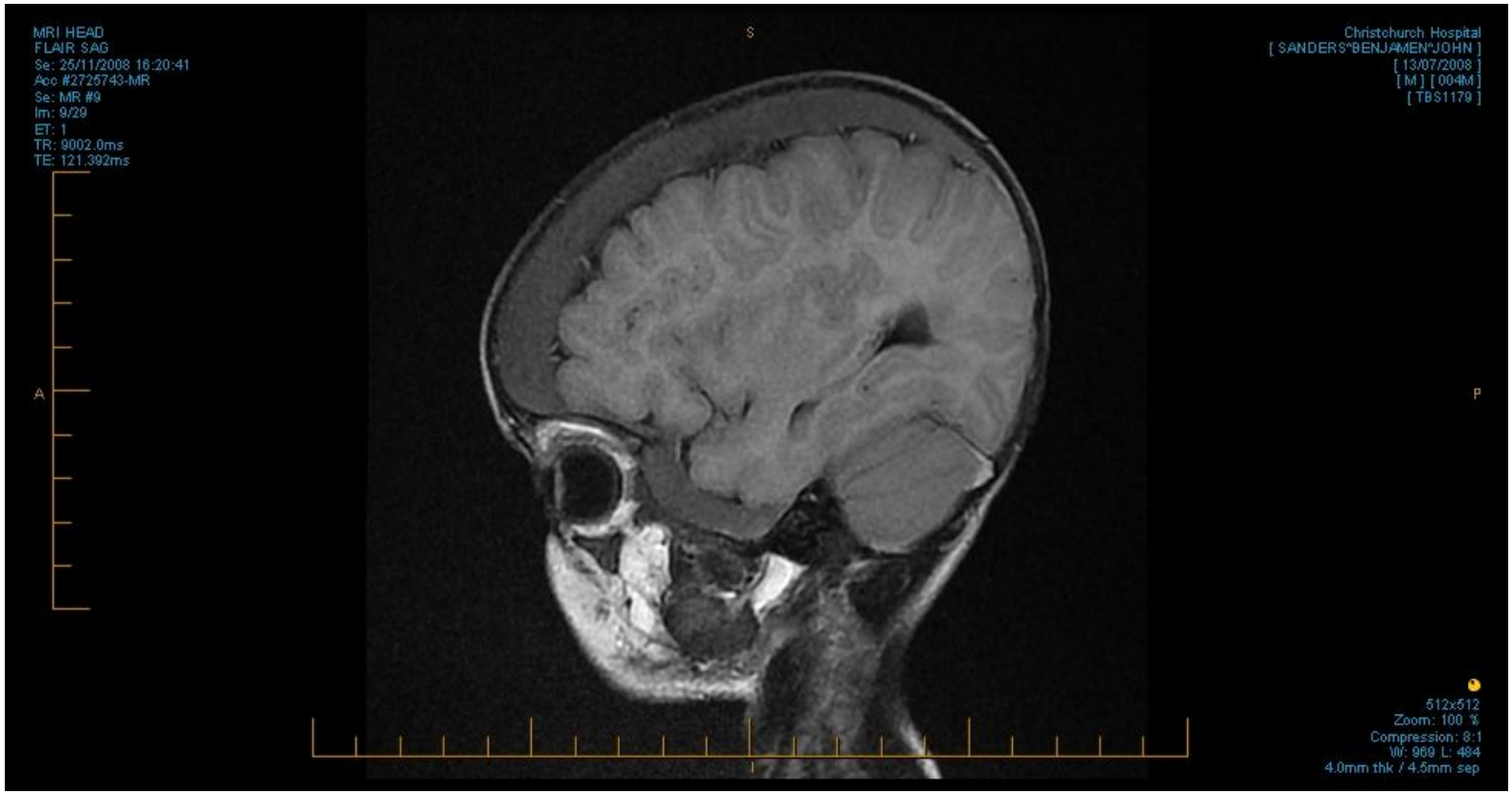
Injury Assessment

Assessment:

- Adequately explained
- Unexplained
- Inflicted
- +/- Concern re supervision

Bruising

- Age & developmental stage
- Body region - location
- Number of bruises
- Pattern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Se: MR #9
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Christchurch Hospital
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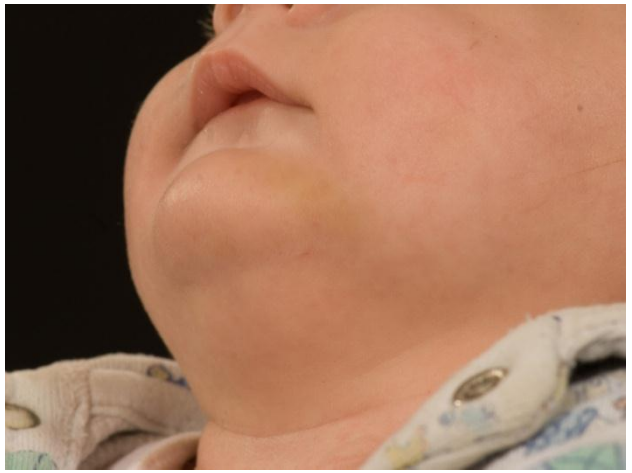
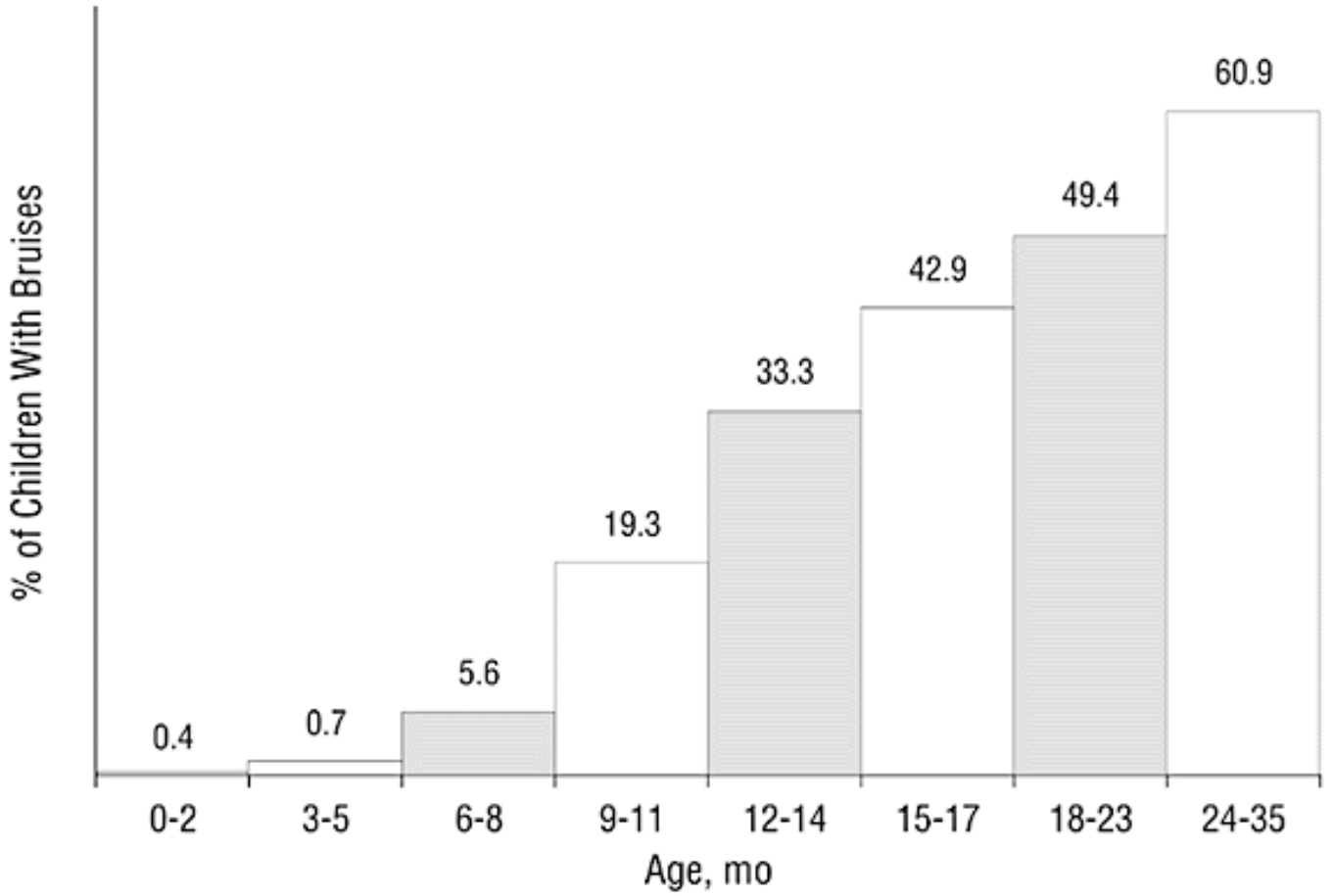


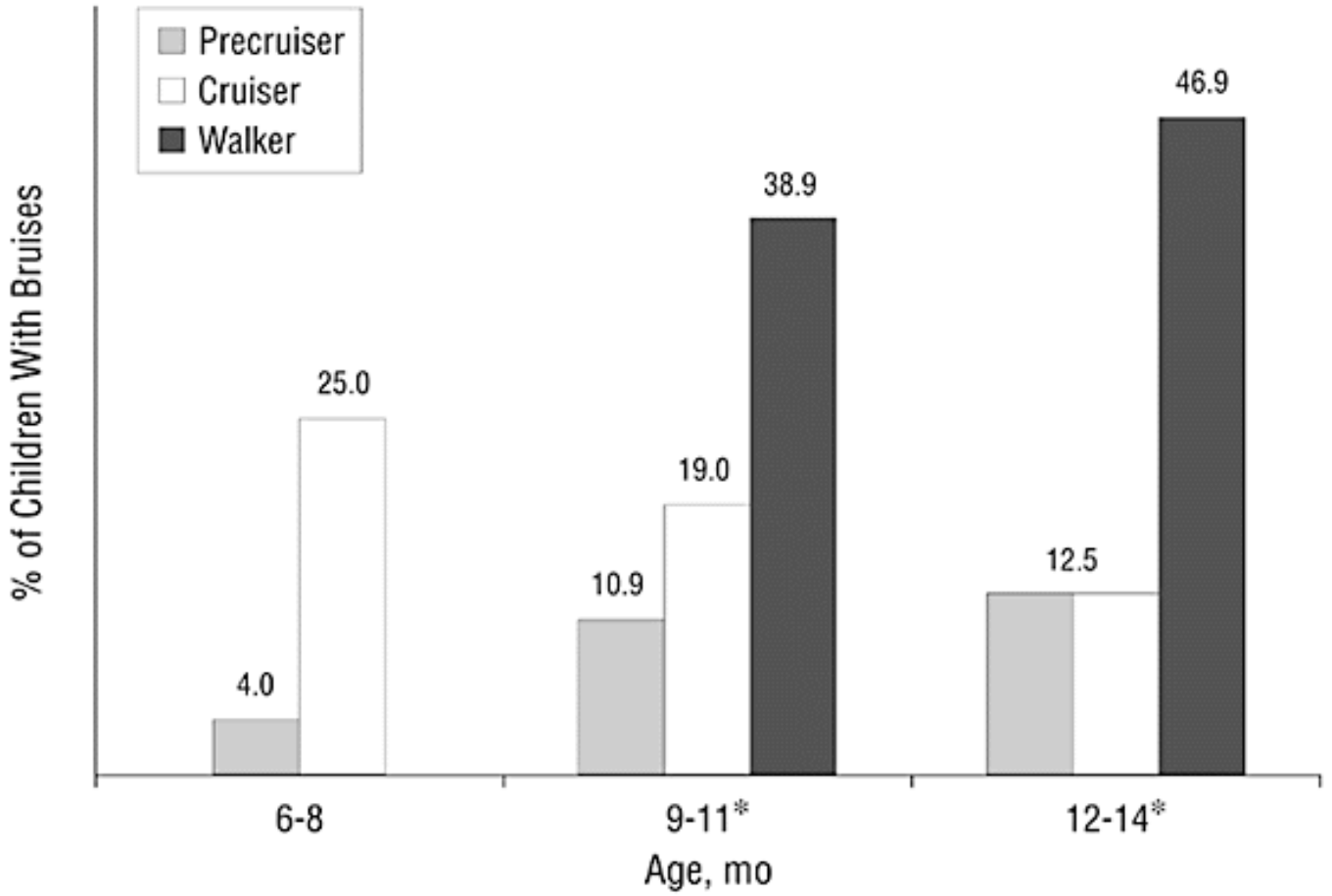
Percentage of children with bruises by age (N=930)



Sugar, N. F. et al. Arch Pediatr Adolesc Med 1999;153:399-403.

ARCHIVES OF PEDIATRICS & ADOLESCENT MEDICINE

Prevalence of children with bruises by age and developmental stage (N=930)



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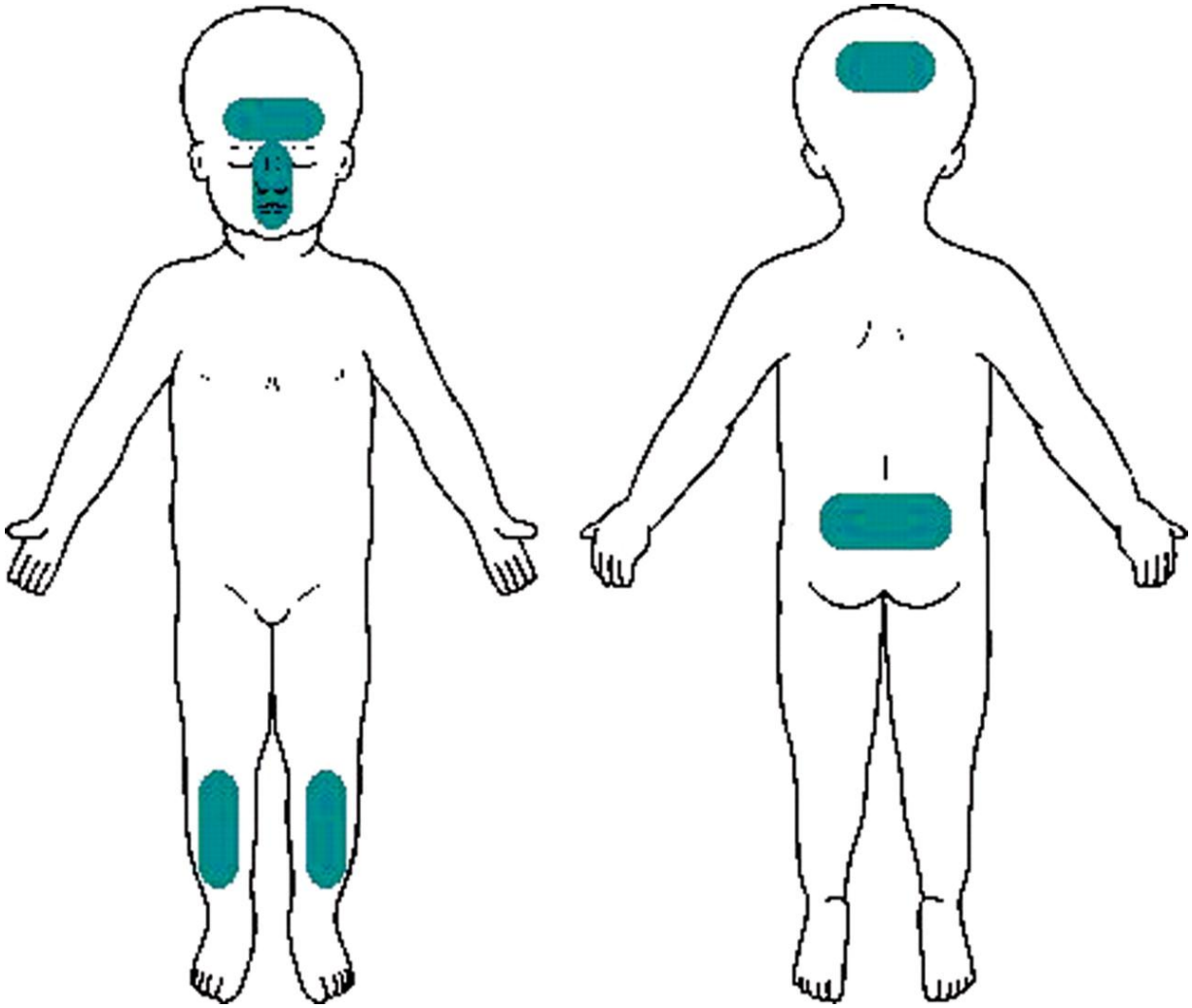
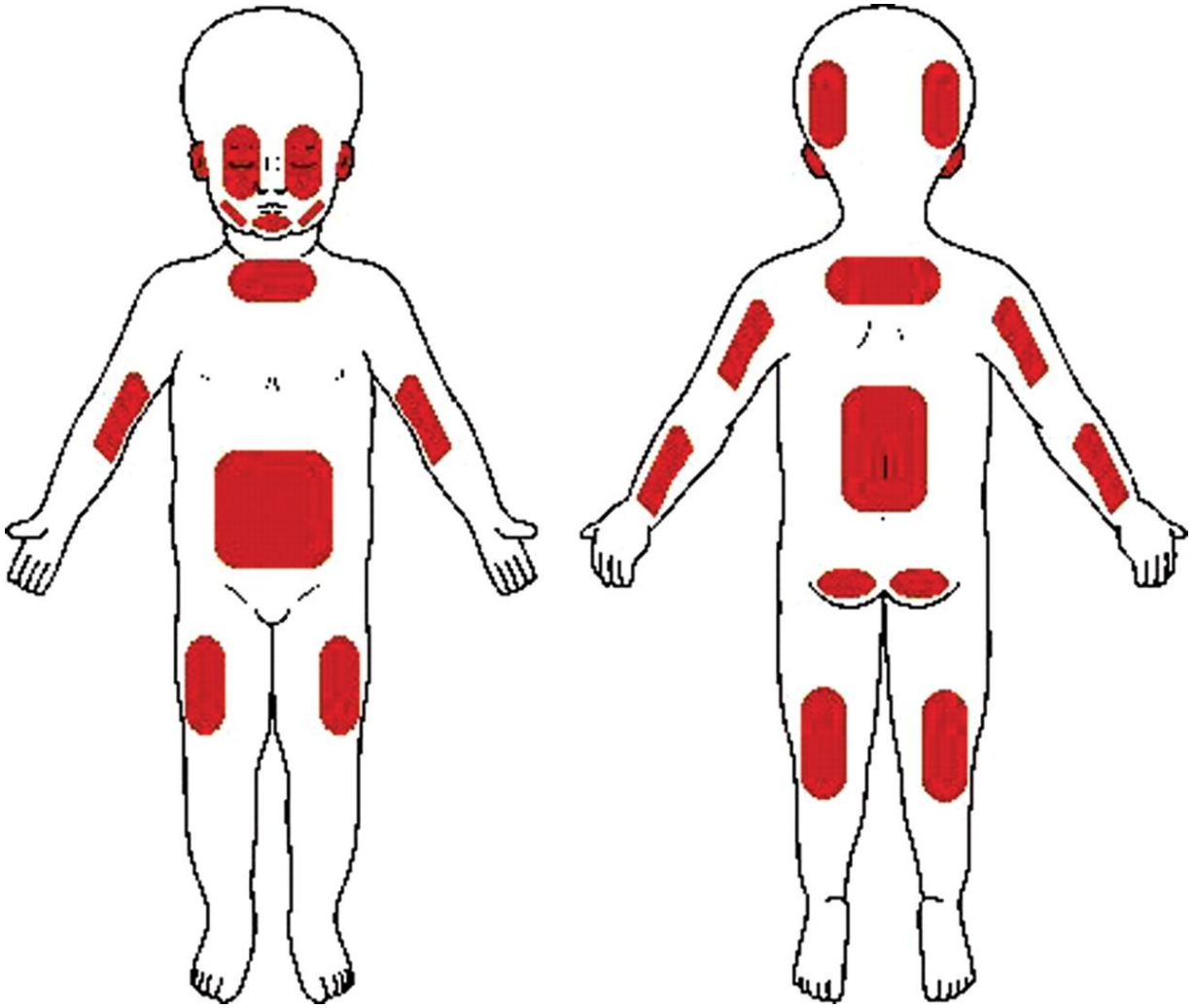
Accidental bruising patterns.



Maguire S Arch Dis Child Educ Pract Ed 2010;95:170-177

Abusive bruising patterns.



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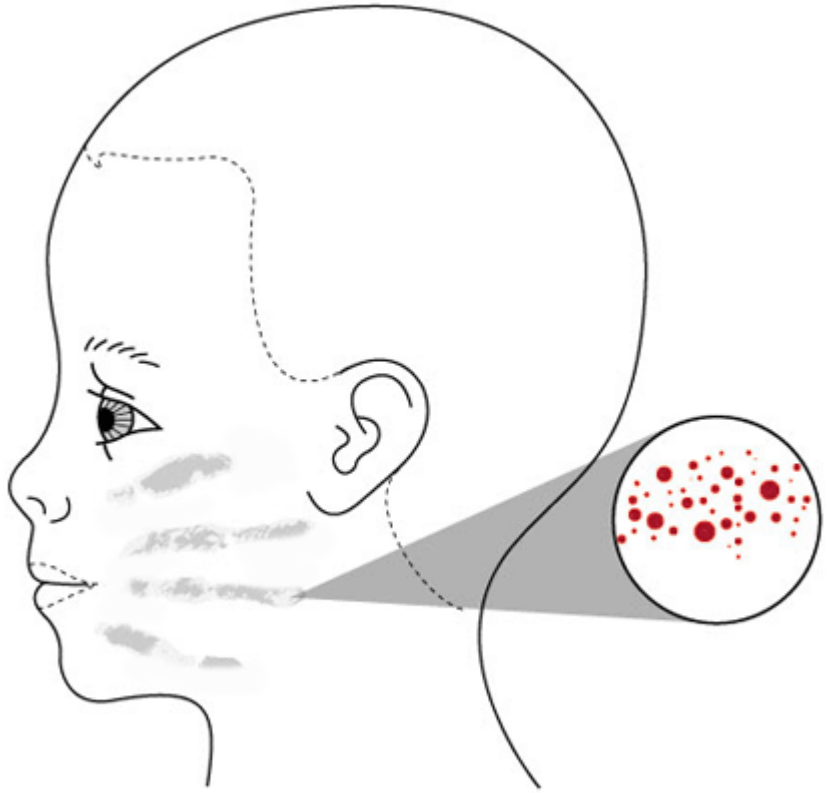
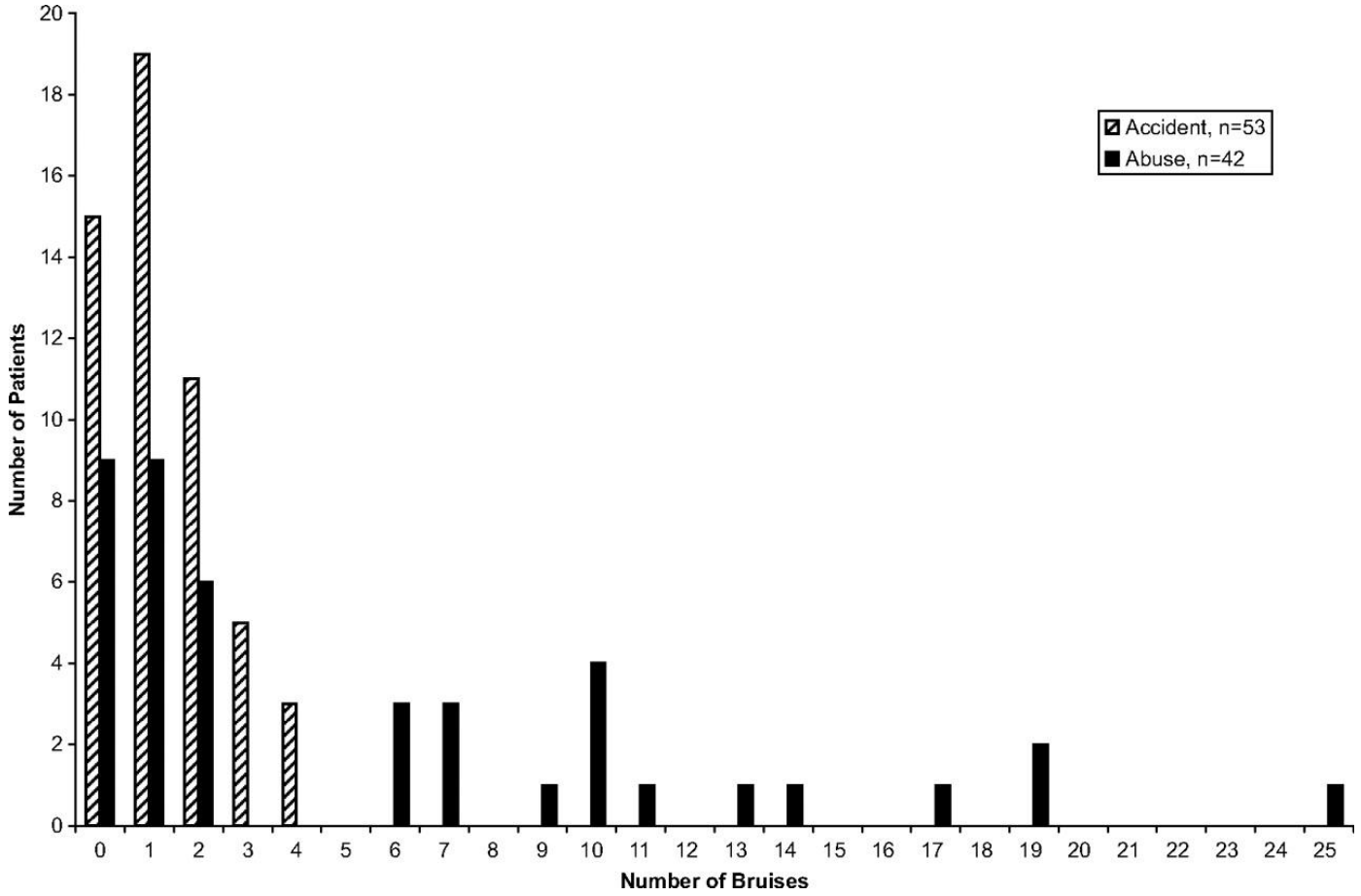


FIGURE 1 Comparison of cumulative numbers of bruises for patients with abusive versus accidental trauma



Pierce, M. C. et al. Pediatrics 2010;125:67-74

PEDIATRICS®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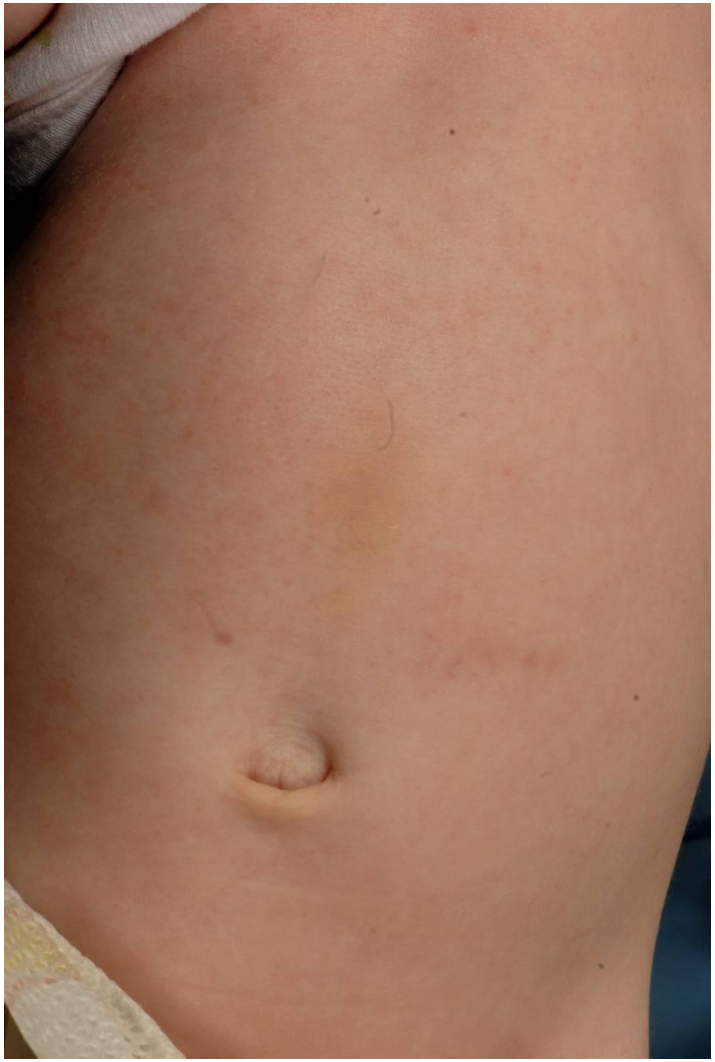
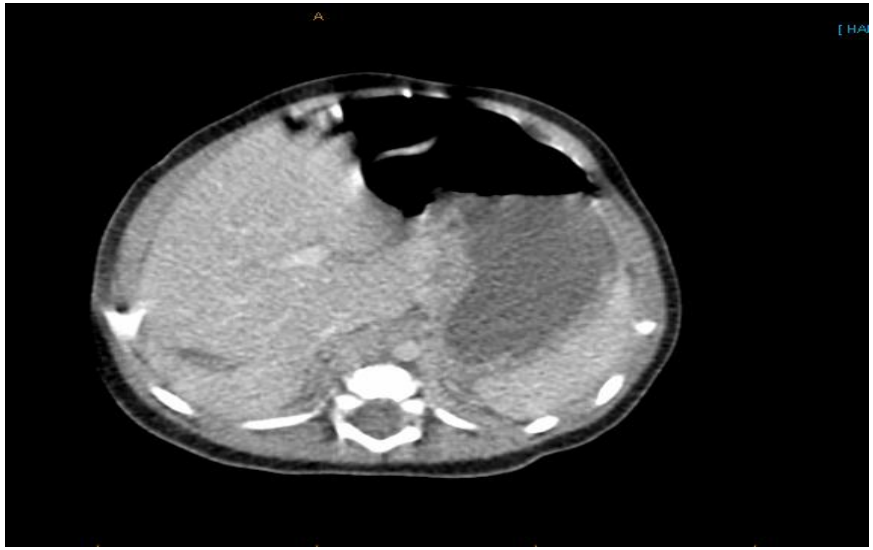
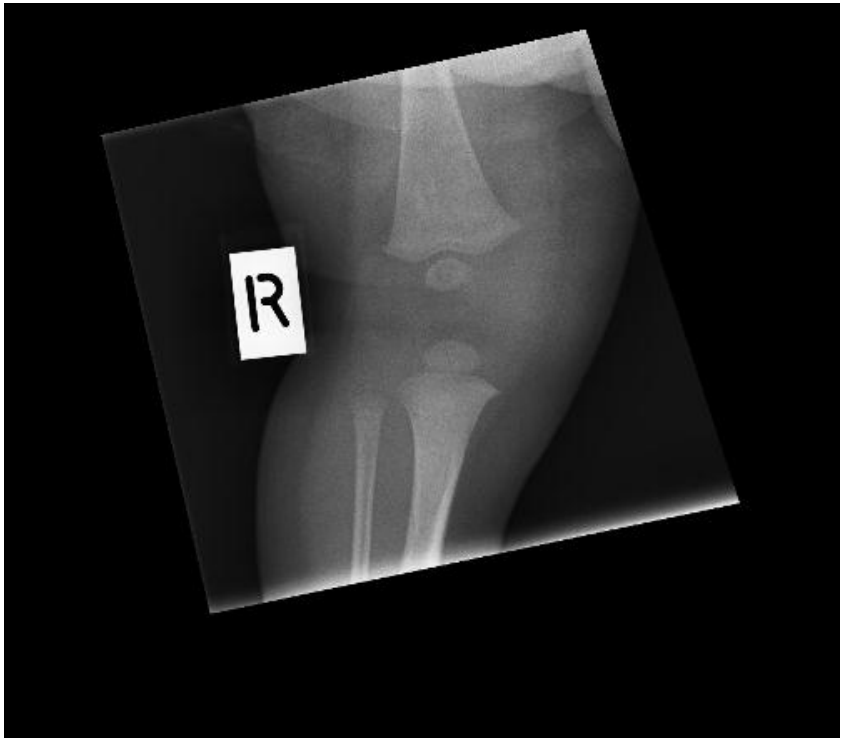
2
3
4
5
6



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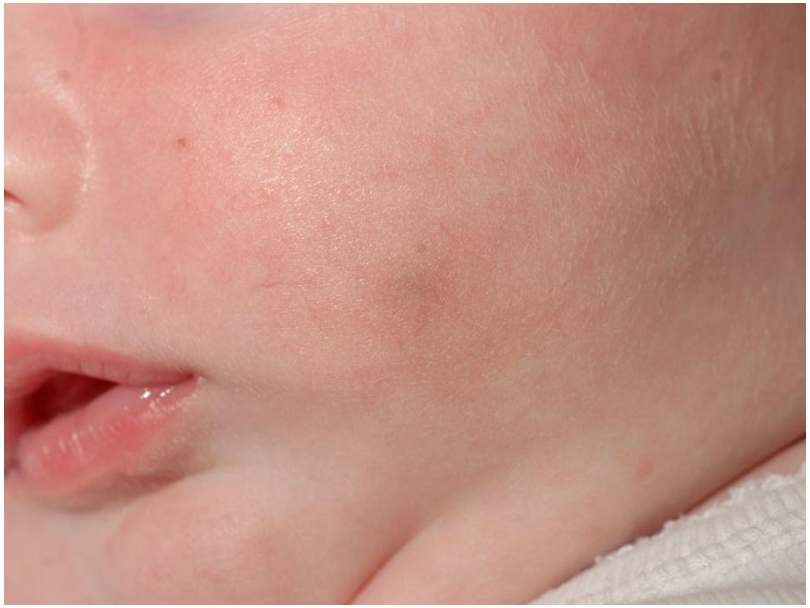
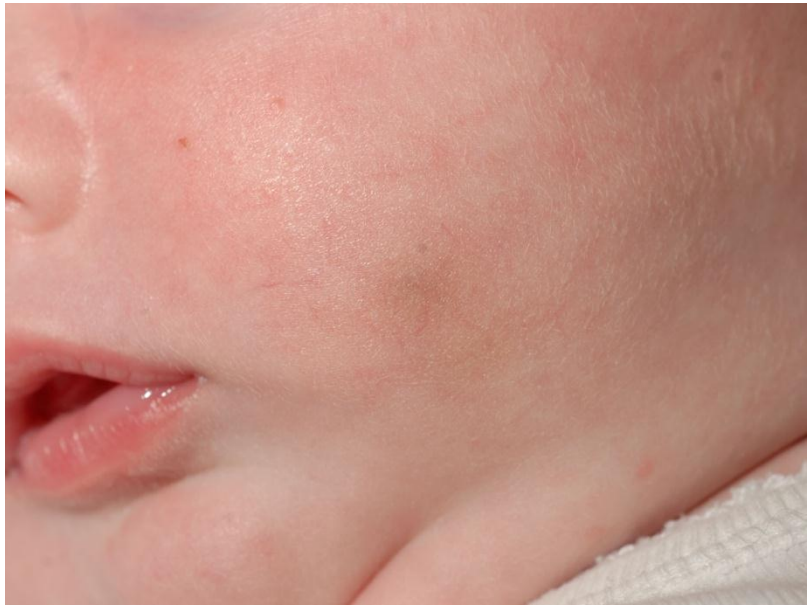
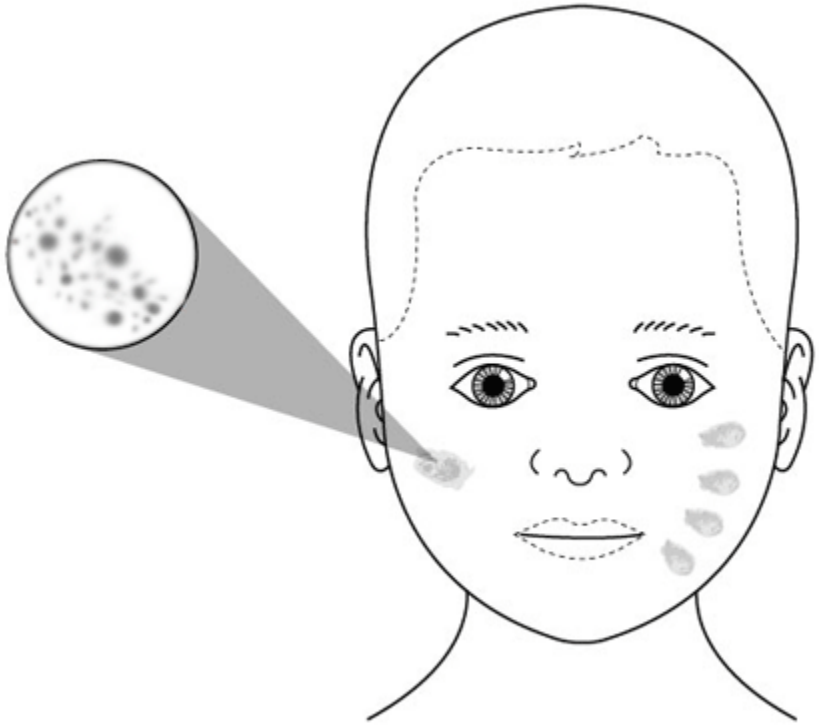







Treasures


5
6
7
8
9
11
12
13
14
15
1
cm
2
3
4
5
6
7


14
13
12

Myths

- Infants bruise easily
- Different coloured bruises are different ages
- The age of bruises can be determined on their colour

Summary

- Bruises related to age & developmental stage
- Bruises rare in non- ambulant infants <9 months
- Further consideration bruises required:
  - Non- ambulant infants <9 months
  - Uncommon location
  - Large number bruises

You Tube Video

Burns

- Avoidable Accident
- Neglect
- Abuse
- Unclear

Abusive Burns

- Mean age injury 2-4yrs
- Scalding most frequent type of abusive burn

  hot tap water

  forced immersion
- Literature documents widely variable incidence

Immersion Burn Distribution

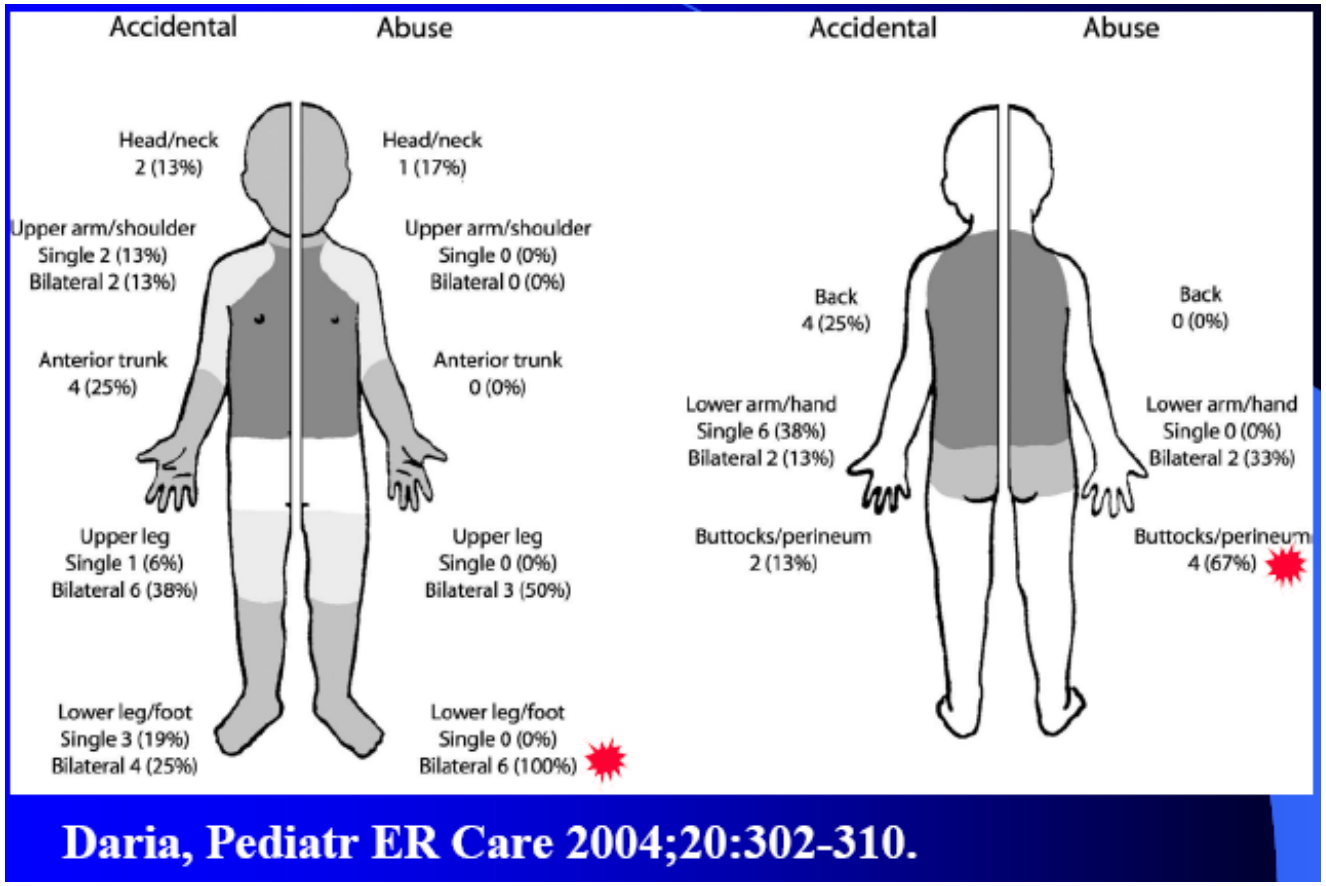
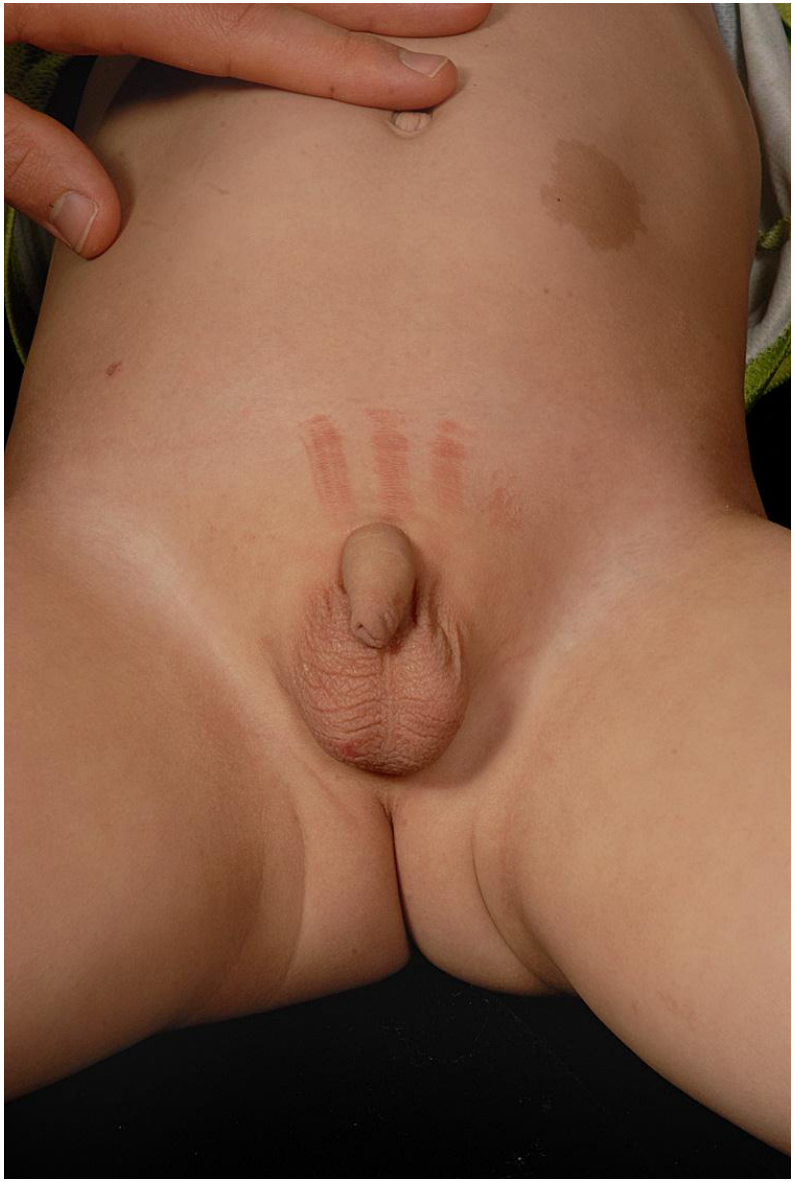


Fig 2: Illustrations of Characteristic Patterns of Scald Abuse

Type of scalding injury	Cutaneous burn pattern	Clues to nonaccidental injury
Forced Immersion 	*Tide Mark* 	Lack of splash marks "Mirror image" burns Clear demarcation of injury
	Donut Hole 	Lack of splash marks Buttocks spared due to contact with cooler bottom of container
	Zebra Stripe 	Lack of splash marks Sparing of flexural creases
Spill/Splash 	*Arrowhead Pattern* 	Posterior location Area with initial contact has most severe burn, with damage decreasing as liquid flows downward and cools Irregular contour and margins

Scalds-Forced Immersion Pattern



Fractures

Fracture type alone cannot distinguish accidental from inflicted trauma

There is no one type of fracture specific to physical assault

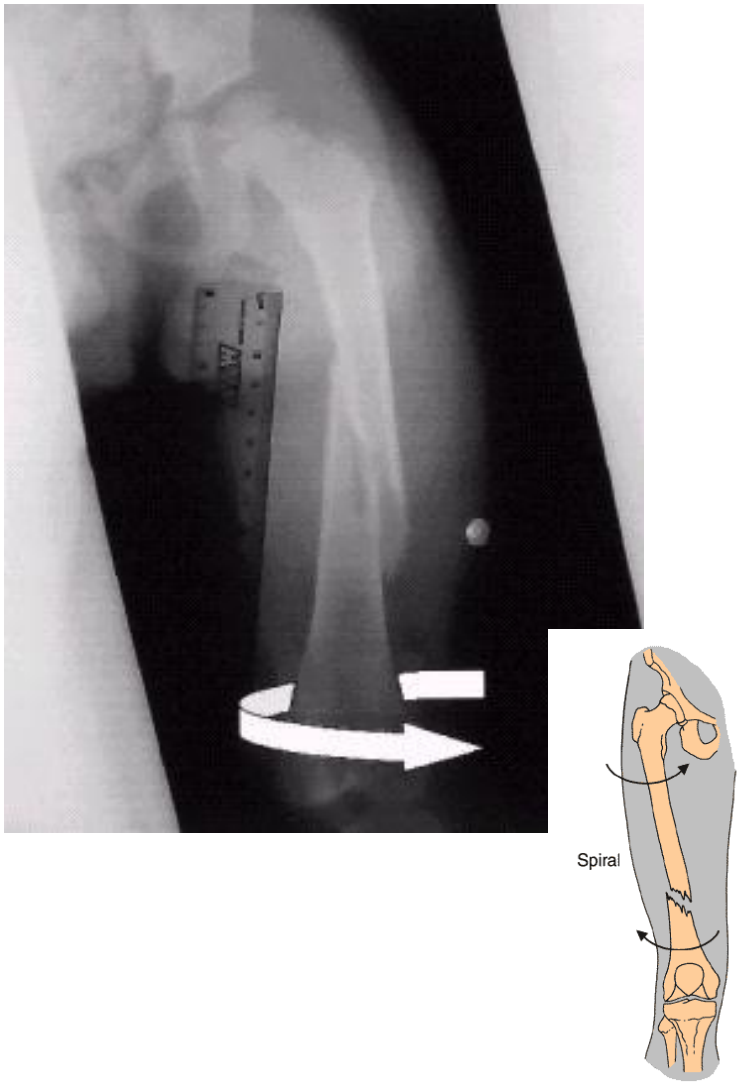
Inverse relationship between the likelihood that a fracture has been inflicted and the age of the child

Inflicted skeletal trauma most prevalent in children < 18/12

Skeletal injury is caused by the result of impact, torsion, distraction or levering forces

Need to describe fracture morphology and determine mechanism

Spiral Fracture



Indirect twisting forces to bone

Occurs when structure twists about its longitudinal axis

Buckle (Torus) Fracture

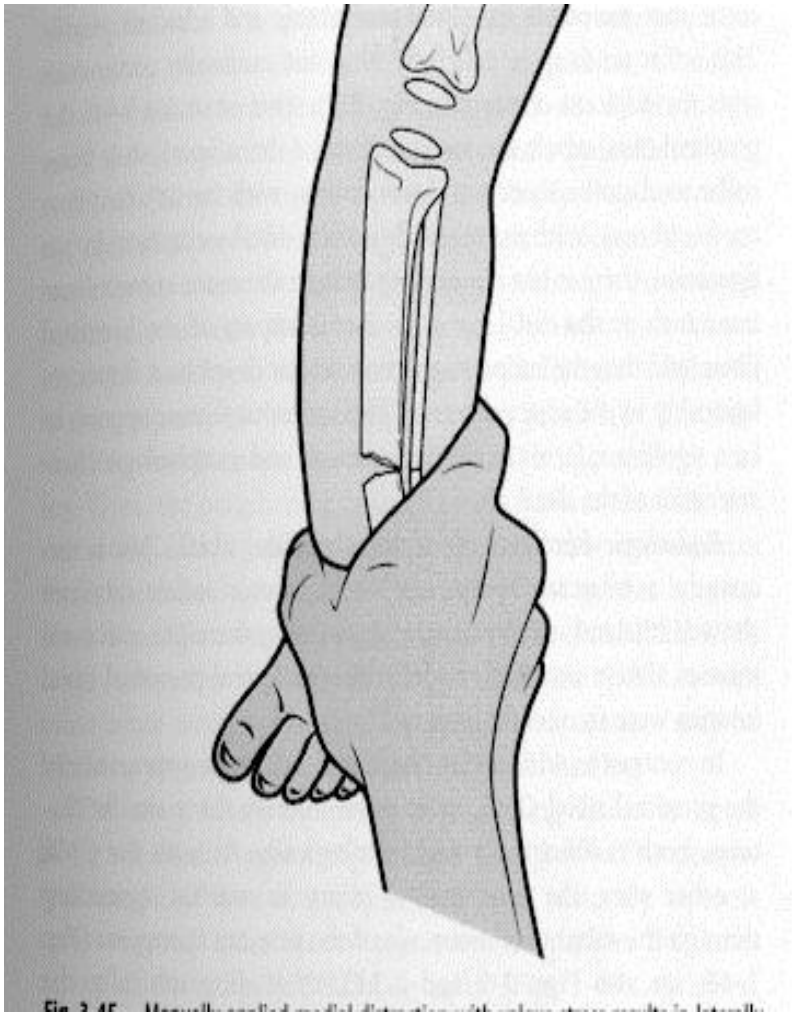
Axial compression loading

Primarily affects developing metaphyseal bone

Bone buckles rather than fracturing completely

Bones: Abusive Fractures
How do we analyse fractures?

- Type of fracture
- Age and development of child
- History incompatible with trauma
- Evidence of abuse such as other fractures, cutaneous injuries, and other injuries

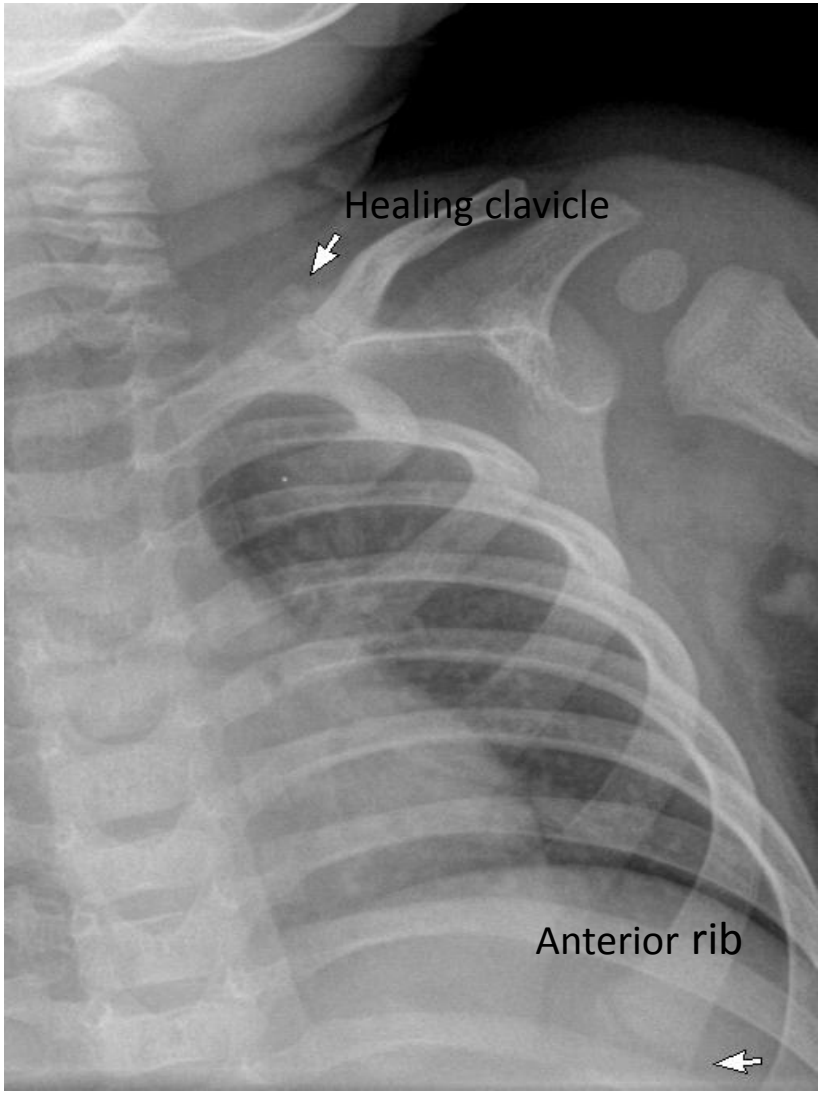


Myths about fractures

- Spiral fractures are nearly always abusive
  - Fact: Spiral fractures can be accidental if a twisting mechanism is implicated.
- Babies bones break easily
  - Young infants have flexible bones that bend before they break
- There should be bruises over inflicted fractures
  - Bruises over inflicted fractures are rare

Rib Fractures

- Unusual in children, except in cases of abuse
  - May see in some metabolic disorders, premature infants, skeletal dysplasias, motor vehicle collisions
  - Rarely caused by CPR
  - Rarely caused by birth
  - Rarely caused by surgery
- Locations
  - Typically posterior
  - Also lateral and anterior



Fractures

- Require further assessment:
  - Unexplained
    - No history, inadequate trauma mechanism
  - Multiple / undiagnosed healing fractures
  - Young infant : Posterior rib fractures
    Metaphyseal fractures
  - Scapular, sternal fractures
  - Fractures hands & feet

When to Act

When caregiver/ child makes allegation that child has been harmed

- ? Injury requiring treatment
- Notification / Safety

When caregiver discusses incident when they harmed child

- ? Injury requiring treatment
- Notification / Safety

Following Injury Assessment

- Injury Unexplained
- “Red Flags” needing further assessment
- Able to conclude injury inflicted

Injury- Be concerned

- Delay in presentation (vs delay in development symptoms)
- Changing history (when taken by same person)
- **No history**
- **When history does not explain injury**
  - **Does not provide explanation for injury mechanism**
  - **Does not explain injury appearance**
  - **Inconsistent with developmental skills**
- **Any young infant with injury**
- **Unusual location**