

Physical Abuse & Neglect Young Children: *The pediatrician's perspective*

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Objectives

- Discuss how medical providers identify and diagnose child maltreatment, specifically physical abuse
- Understand why child abuse pediatrics requires a multidisciplinary team to arrive at the correct diagnosis

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Now What?

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NC Child Abuse Reporting Statutes: social services

- **§ 7B-301. Duty to report abuse, neglect, dependency, or death due to maltreatment.**

Any person or institution who has cause to suspect that any juvenile is abused, neglected, or dependent, as defined by G.S. 7B-101, or has died as the result of maltreatment, shall report the case of that juvenile to the director of the department of social services in the county where the juvenile resides or is found. The report may be made orally, by telephone, or in writing.

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What is Physical Abuse?

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American Academy of Pediatrics (AAP)
****November 5, 2018 – American Academy of Pediatrics OPPOSES corporal punishment, draws on recent evidence.****



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NC Definitions: Neglect



Neglected juvenile. – A juvenile who does not receive proper care, supervision, or discipline from the juvenile's parent, guardian, custodian, or caretaker; or who has been abandoned; or who is not provided necessary medical care; or who is not provided necessary remedial care; or who lives in an environment injurious to the juvenile's welfare; or who has been placed for care or adoption in violation of law. In determining whether a juvenile is a neglected juvenile, it is relevant whether that juvenile lives in a home where another juvenile has died as a result of suspected abuse or neglect or lives in a home where another juvenile has been subjected to abuse or neglect by an adult who regularly lives in the home.

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Abuse or Neglect?

Medical diagnoses and/or documentation may not agree with child welfare decision

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How Do Medical Providers Identify Abuse/Neglect?

- When assessing a child for an injury
 - Does the history match the injury?
 - Is the injury developmentally plausible?



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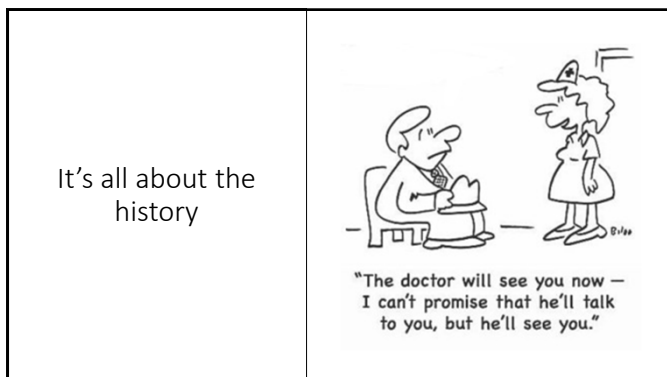
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Specificity of abuse by fracture type
Kleinman, 1998

Specificity of Abuse	Type of Fracture
High	Classic metaphyseal lesion Rib fractures Scapular fractures Spinous process fractures
Moderate	Vertebral body fractures Digital fractures Complex skull fractures
Low	Subperiosteal new bone formation Clavicular fractures Linear skull fractures Long bone shaft fractures

A diagnosis of abuse is NOT made on the injury type alone


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History Taking

- Determining when the child was last well
 - "Tell me the last time you saw your baby acting normally"
 - "When was the last time your child was acting and feeding without any problems?"
- Slow down with the history
 - Repeat back what was provided to ensure it's accurate
 - Put relevant statements in quotes
 - Document what's different from other histories



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Components of History in Abuse/Neglect

Components

Identify source of information
Identify the mental status/condition of the caregiver at the time of child's injury and/or all symptoms
Determine if the injurious event was witnessed, witnessed, or not witnessed and not heard by the historian
Identify the last witness to well/asymptomatic behavior
Identify the last location where the child was well
Identify the last point in time when the child was well
Identify specific location where injury occurred
Identify the timing of injurious event
Identify who heard or saw injurious event and position of child and those individuals
Identify the position/location of child immediately after event
Identify the activity of child immediately prior to event
Identify surfaces/objects potentially impacted during event
Identify specific body part(s) impacted during injurious event
Identify the child's physical position after the injurious event
Ask witnesses to reenact mechanism
Identify the nature of the child's first symptoms
Identify the first person that identified the child's symptoms
Identify the order of appearance of all symptoms
Identify the duration of all symptoms
Identify clothing worn at time of injurious event

Identify last witness to well/asymptomatic behavior

Identify who was present when injury was recognized and what was their response

Identify location of child when found, clothing worn, position of child, etc.

Details, details details!

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Recognition of Abuse/Neglect



Concerning features when interviewing caregivers

- Changing story

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Recognition of Abuse/Neglect

Concerning features when interviewing caregivers

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- Delay in seeking care



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Recognition of Abuse/Neglect

Concerning features when interviewing caregivers

- Changing story
- Delay in seeking care
- Developmental skills described are inconsistent with child's age
- History doesn't explain injuries
- Absence of a history
- Multiple injuries (e.g.; poisonings, fractures)
- Sibling blamed for injuries

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Challenges to Identification & Reporting

- Fear of offending families
- Bureaucratic issues impede ability to assess physical abuse
- Relationships with families bias our assessment

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Cognitive Bias

- A patient's race, ethnicity, cultural background or injury type may impact quality of information obtained and ultimately the decision making.




Looney, 2011; Zellman, 1992; Lane, 2002
<https://heliosids.com/top-ed-in-child-welfare-the-racial-bias-is-everywhere-even-in-the-research/>

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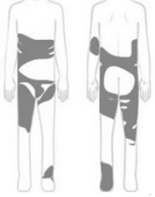
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Non-Accidental Burns



- Features suggestive of forced immersion (absence of splash marks)
- Skin sparing
- Symmetric burns
- Burns localized to perineum, buttocks
- Features suggestive of inflicted contact burns
- Injuries to other organ systems

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Is this Child Abuse?

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	<p>She got burned standing on the Stovetop</p>	

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28

<p>Is this Child Abuse?</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>

29

<p>Hand burned by stove</p>

30

	<p>He touched the stove and got burned</p> <hr/>	

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<p>Is this child abuse?</p>

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Diagnosing Child Physical Abuse

Components of the medical evaluation

- History of events/concern
- Physical exam
- Laboratory and/or radiology studies

-Scene investigation and/or collateral information

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Multidisciplinary information

New information can impact medical opinions

- Temperature of an agent/object
- Type of agent/object
- Interviews with siblings



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Why is this concerning?

- 3 month old infant
- Bruising on face and cheek
- History: "maybe her sister hit her with a toy"

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Concerning Features

- Changing story
- Delay in seeking care
- Developmental skills described are inconsistent with child's age
- **History doesn't explain injuries**
- Lack of a history
- Multiple injuries (e.g.; poisonings, fractures)
- **Sibling blamed for injuries**

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Why is this Important?



- Recognition of sentinel injuries may result in prevention of serious physical injuries
- Sentinel injuries preceded serious physical abuse in 27.5% of cases (Petska and Sheets, 2014)

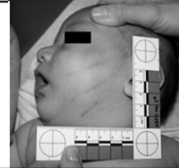
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What is a Sentinel Injury?

Petska, 2014

Box 1
Definition of sentinel injuries

- Minor injuries, such as a bruise or intraoral injury (excluding skin abrasions)
- Precursing infant
- Visible or detectable to a caregiver
- Poorly explained and unexpected



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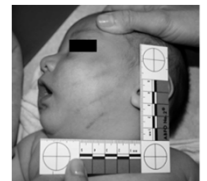
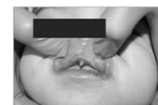
Predictors of increasing injury severity

What's known:

- 1/3 of children who are the subject of first maltreatment reports are re-reported within 5 years
- **Risk factors:** young age and "minor injuries"



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Recognition of Sentinel Injury: What's Next?

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Medical Evaluation of a Sentinel Injury

Follow medical guidelines for evaluation of physical abuse (<2y)

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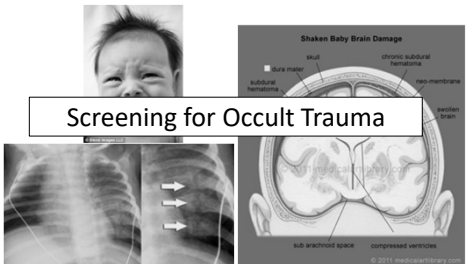
What's the **general** evaluation for physical abuse (<2y)?

- Skeletal Survey
- Eye exam
- Imaging of the brain by CT and/or MRI
- Laboratory Evaluation
 - Screening for occult abdominal trauma
 - Urine drug screen
- Outpatient medical follow-up after discharge if admitted
 - Repeat skeletal survey

Screening for Occult Injuries

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Medical Evaluation for Physical Abuse (<2y)




Screening for Occult Trauma

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Value of occult injury evaluation

Screening study	Total, n = 2895, n (%)	0-6 months, n = 960, n (%)	Study cohort, n = 146, n (%)
SS obtained	2049 (70.8)	909 (95.3)	137 (93.8)
SS shows new injury	421 (16.3)	203 (20.3)	34 (22.3)
Neuroimaging obtained	1692 (58.4)	857 (87.4)	133 (91.1)
Neuroimaging shows new injury	727 (25.2)	368 (37.6)	40 (27.4)
Repeat neuroimaging obtained	1338 (46.2)	706 (72.2)	92 (63.0)
Abdominal CT obtained	282 (10.1)	105 (10.7)	16 (10.9)
Abdominal imaging shows new injury	73 (2.5)	22 (2.2)	2 (1.3)



Harper, 2014

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Limitations in medicine



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Table 1

Determine Age of a Bruise by Its Color	Bruise
Color of Bruise	
Red (swollen, tender)	2 days
Blue-purple	3-5 days
Green	6-10 days
Yellow	10-14 days
Brown	15-20 days
No further evidence of bruising	2-4 weeks

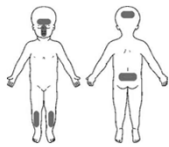


Bruising

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Importance of Bruising Patterns

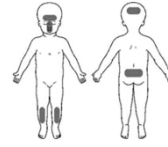
The practice of estimating the age of a bruise from its color has no scientific basis and should be avoided in child protection proceedings (Maguire, 2005)



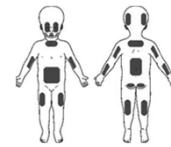
Accidental Patterns

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Importance of Bruising Patterns



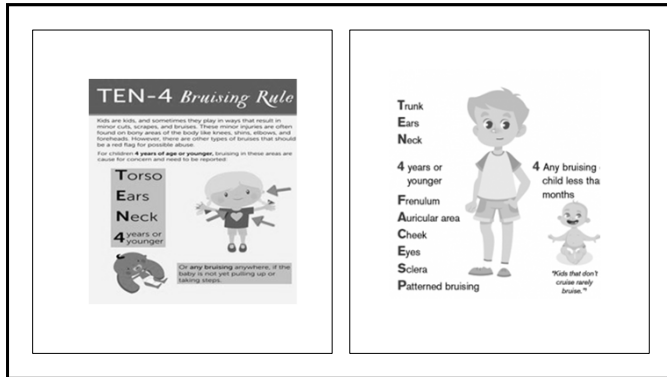
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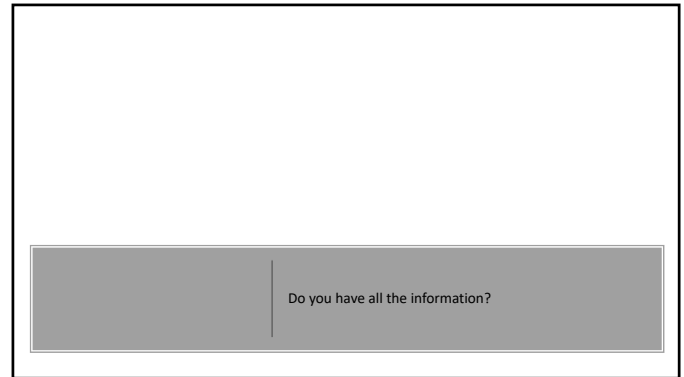
Abusive Patterns

Maguire

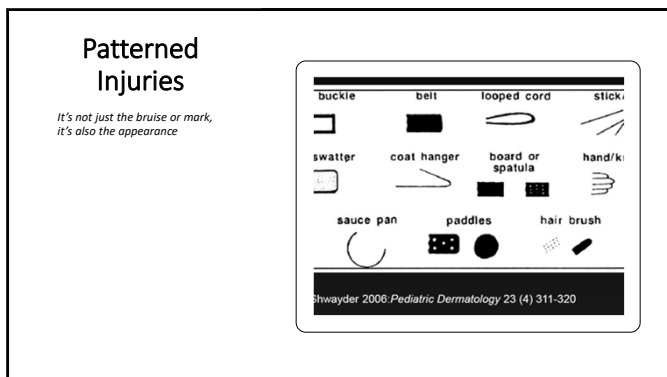
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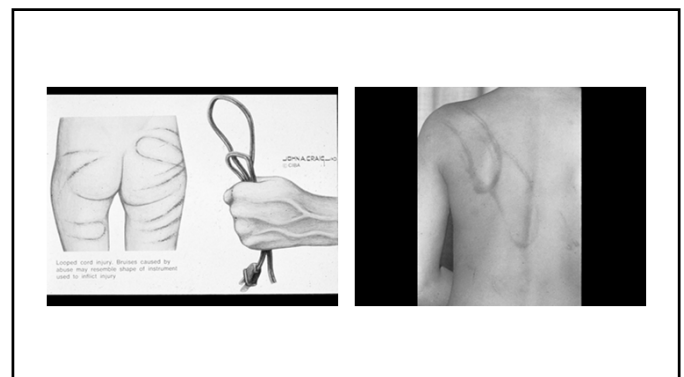
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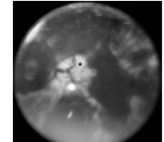
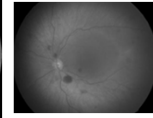
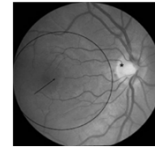
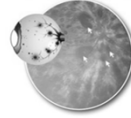


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What caused this mark?

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Retinal Hemorrhages
Associated with nonaccidental trauma



"Buzz words" ≠ Diagnoses

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What Tests Should be Ordered?

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Fractures

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Fractures: Reaching a medical diagnosis

No fracture on its own can be used to diagnose child abuse

What medical providers need

1. A detailed history
2. If provided, a mechanism of injury
3. Access to a complete medical evaluation



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Fractures: It's all about the history

TABLE 1: Time Since Injury When the Radiologic Signs of Fracture Healing Are Present as Proposed in Radiology Textbooks and Primary Scientific Studies

Radiologic Feature	Radiology Textbooks			Scientific Studies		
	O'Connor and Cohen [2]	Orphan and Hall [3]	Islam et al [5]	Yeo and Reed [6]	Cumming [7]	
Soft tissue swelling	2-5 d	4-10 d	10-21 d	< 7-10 d		
Resolution of soft tissues				> 7 d	4-6 wk (56%) (2-8 wk)	
Fracture gap widening				7-10 d	4-7 wk (100%) (> 2 wk)	9-10 d (7-11 d)
Periosteal reaction presence (stage I)	4-10 d	10-14 d	14-21 d		1.6 wk (1-3 wk)	
Marginal sclerosis					4-6 wk (85%) (2-11 wk)	
First callus	10-14 d	14-21 d		1-6 wk	4-7 wk (100%) (> 2 wk)	
Callus density > cortex	14-21 d	21-42 d	42-90 d		13 wk (50%) (> 4 wk)	
Bridging (stage II)					13 wk (50%) (> 3 wk)	
Periosteal incorporation					14 wk (> 7 wk)	
Remodeling (stage III)	3 mo	1 y	> 2 y		9 wk (50%) (> 4 wk)	8 wk (5-11 wk)

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Understanding Future Risk & Treatment : *Importance of the Social history*

Social History

- Caregiver age, employment, parenting experience
- Domestic violence exposure
- Caregiver mental health & substance use history
- Other adverse childhood experiences

+Risk factors ≠ Medical diagnosis of abuse

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Summary

- Medical providers identify and diagnose physical abuse and/or neglect based on available information
 - Developmental concerns and abilities contribute to formulating a diagnosis
 - A multidisciplinary response assists with ensuring the most accurate diagnosis
- Medical experts should rely on published literature and medical society guidelines to ensure a complete medical evaluation
- Know your local experts: <https://www.med.unc.edu/cmep/>

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Is this a sentinel injury?

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Thank You!



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