Identify to Protect

HOW TO IDENTIFY SIGNS AND SYMPTOMS OF ABUSE IN YOUNG CHILDREN

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Content

The importance of early recognition

Early signs and symptoms of abuse

The medical workup and its purpose

How to make an effective report to child protective services

Outcomes of making a report

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Child Abuse Pediatrician

Board certified subspeciality of pediatrics

Extensive training to differentiate abuse from non-abuse

Expertise in court testimony

THE AMERICAN BOARD of PEDIATRICS

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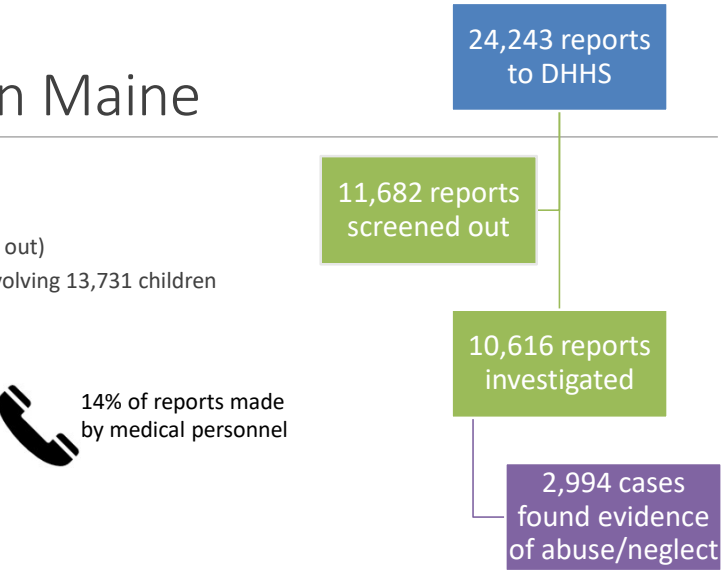
Child Abuse in Maine

Data for 2020

24,243 calls to DHHS
- 11,682 not assigned (screened out)
- 10,616 reports investigated involving 13,731 children

28% of investigations found evidence of abuse or neglect

14% of reports made by medical personnel



Source: Child Welfare Report 2020 Produced by: Office of Child and Family Services Maine Department of Healthy and Human Services

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High stakes

Highest fatality rate due to abuse is in children < 3 years old

- **Age** is the most significant risk factor for abuse- infants and toddlers being at greatest risk of serious and fatal physical abuse

Physicians were noticing that children with significant head trauma had prior "minor" antecedent injuries

- Lack of gross motor ability
- Implausible or no explanation

"Failure to recognize bruising caused by physical child abuse is a missed opportunity and an error in medical decision making that contributes directly to poor patient outcomes"

Pierce MC, Kaczor K, Lorenz DJ, et al. Validation of a Clinical Decision Rule to Predict Abuse in Young Children Based on Bruising Characteristics. *JAMA Netw Open*. 2021;4(4):e215832. doi:10.1001/jamanetworkopen.2021.5832

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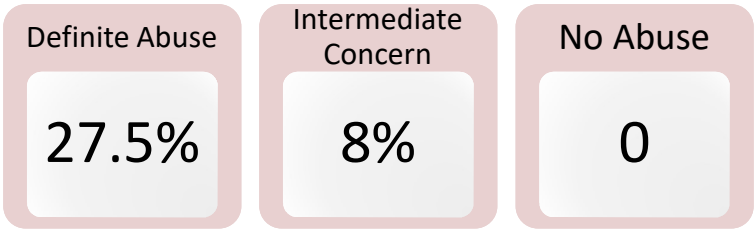
Sentinel Injuries in Infants Evaluated for Child Physical Abuse

Case-control retrospective study of 401 infants (<12 months)

27.5% of the 200 definitely abused infants had previous sentinel injury

8% of the 100 infants with intermediate concern for abuse had previous sentinel injury

None of the 101 non-abused infants (controls) had a previous sentinel injury



Sheets LK, Leach ME, Koszewski IJ, Lessmeier AM, Nugent M, Simpson P. Sentinel injuries in infants evaluated for child physical abuse. *Pediatrics*. 2013;131(4):701-707. doi:10.1542/peds.2012-2780

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Sentinel Injuries

Injury is detected by a parent, caregiver, or medical provider

Often identified retrospectively in history or physical examination of a now seriously abused infant.

28-64% of children who sustain severe physical abuse were found to have had a prior "sentinel" injury

Indicator of an unsafe environment	Uncommon in nonabused infants

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What is a sentinel injury?

Any injury in an infant

<u>< 4 months old (or otherwise non-mobile)</u>

for which the differential diagnosis should include physical abuse.

Includes:

- bruises
- burns
- lacerations (cuts)
- Fractures
- mouth injuries
- eye injuries
- intracranial injuries
- abdominal injuries
- genital injuries

Excludes:

- subconjunctival hemorrhage in infants < 2 weeks of age
- birth-related injuries
- injuries from a motor vehicle accident
- animal bites
- hair tourniquets
- superficial eye injuries (e.g. corneal abrasions)

Sentinel injury should *almost always* always result in a child abuse workup

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Cutaneous Injury

Bruising is rare in pre-ambulatory children!

- "those who don't cruise rarely bruise"
- Must initiate a work-up for abuse

In ambulatory kids, accidental injuries are more likely to be over bony prominences

- Abuse injuries in less common areas like TEN 4 FACESp

Bruises cannot be aged based on color

Concerning bruising locations:
T: Torso
E: Ears
N: Neck on children
4: Under 4 years old and bruising *anywhere* on children under 4 months
F: Frenulum
A: Angle of Jaw
C: Cheek
E: Eyelid
S: Sclera
P: Patterned injury

Schwartz AJ, Ricci LR. How accurately can bruises be aged in abused children? Literature review and synthesis. *Pediatrics*. 1996;97(2):254-257.

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TEN-4-FACESp

Children 4 months and younger

Clinical decision rule was 95.6% sensitive and 87.1% specific for abuse

94% of patterned bruises observed in patients categorized as abuse

Pierce MC, Kaczor K, Lorenz DJ, et al. Validation of a Clinical Decision Rule to Predict Abuse in Young Children Based on Bruising Characteristics. *JAMA Netw Open*. 2021;4(4):e215832. doi:10.1001/jamanetworkopen.2021.5832

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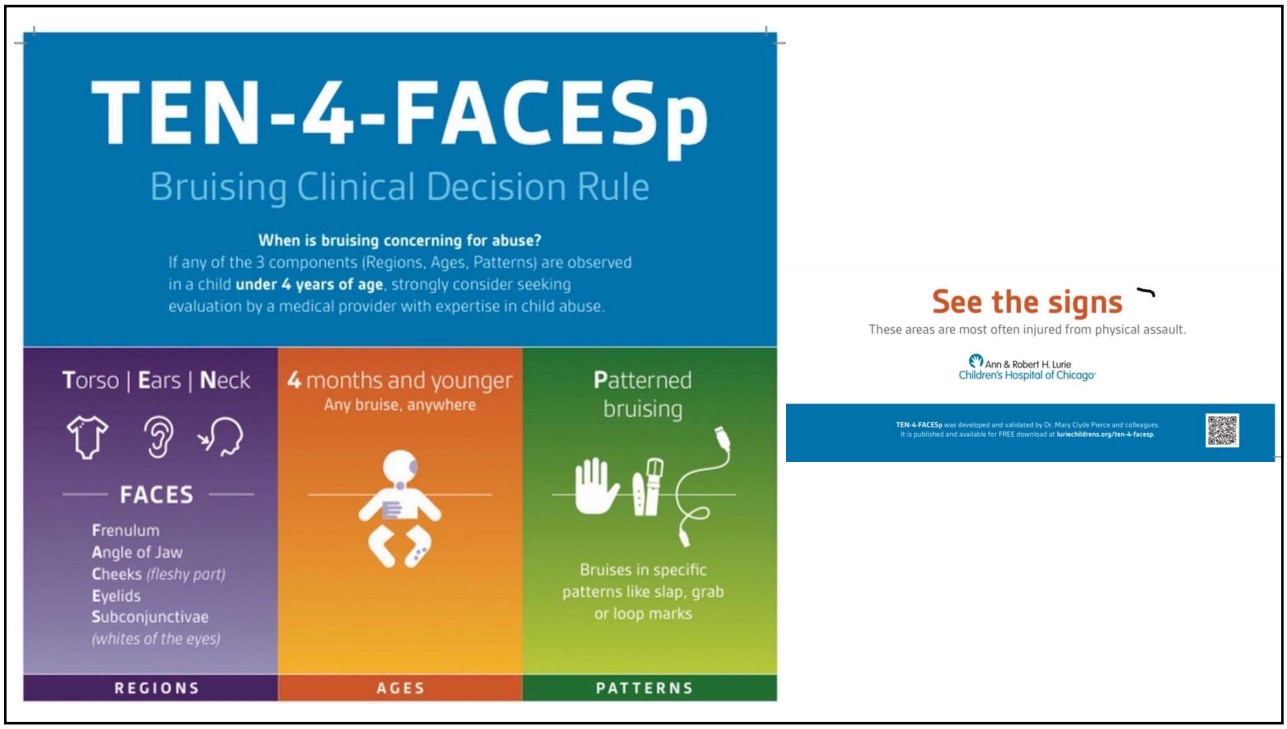

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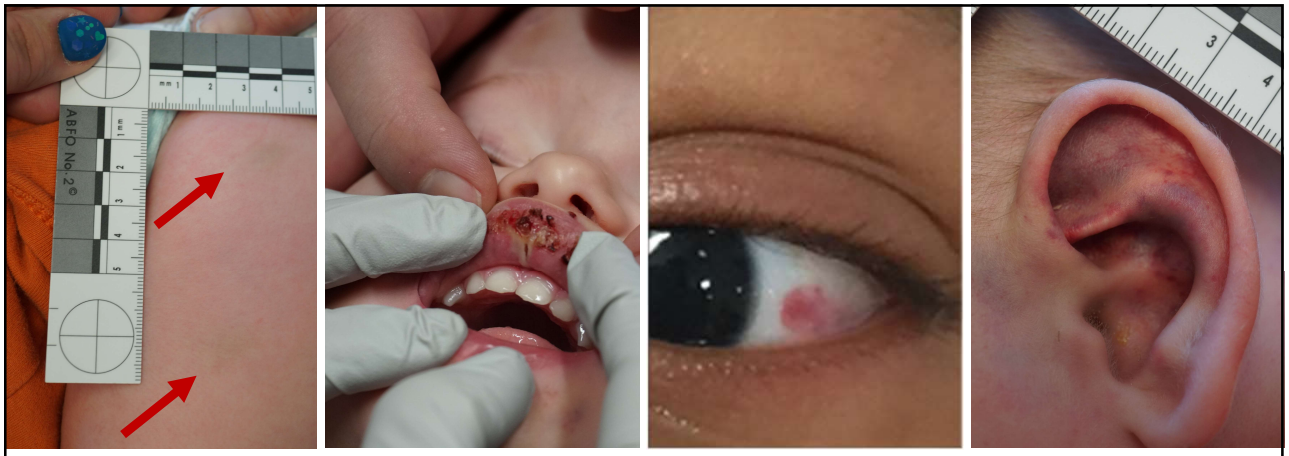

TEN 4 FACES-p

- Thigh bruising on an infant
- Frenula Injury
- Subconjunctival hemorrhage
- Ear bruising

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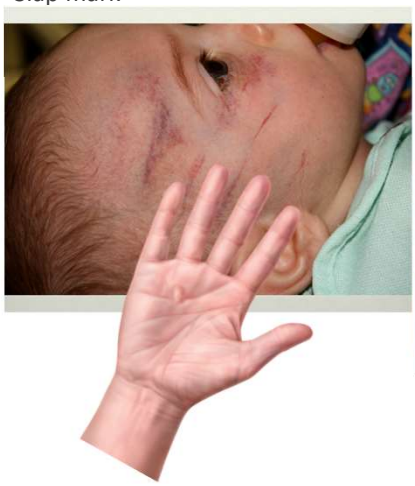
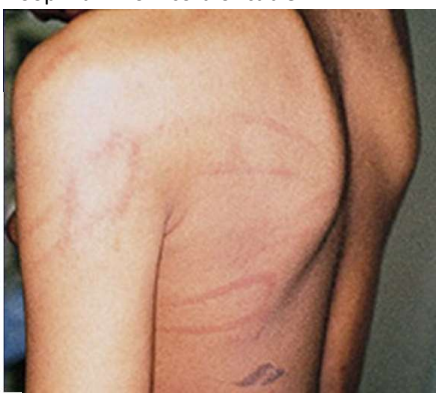
Patterned Injury

Slap mark

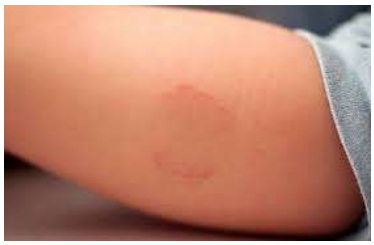


Loop mark from cord or cable



Human Bite mark

- Adult bite > 2cm between maxillary canines



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Bruising on infants is a big deal

- TEN 4 FACES-p
- Indicator of a potentially unsafe environment
- Almost always should result in a physical abuse work-up

Bruising cannot be dated based on color

Take-away points

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Evaluation for physical abuse

We <u>cannot</u> rely on clinical gestalt, caregiver "appropriateness", biases

We can rely on:

1. Thorough history and physical
2. Follow evidence-based guidelines for the work-up of physical abuse

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Physical abuse- History

Get a thorough history and details around the reported mechanism of injury, timing of the injury and symptoms, who was the caregiver, when was the child last normal

Abused children often present with vague or nonspecific complaints

No need to interview the child/ investigate for yourself

Concerning History Components

- Chief complaint does not contain caregiver concern for an injury *and* plausible history
- Caretaker response not commensurate to injury
- Unexplained delay in seeking care
- Lack of, inconsistent, or changing history
- Inconsistencies or discrepancies in histories provided by involved caretakers
  Child not developmentally able to do the activity
  Injury attributed to pet or sibling

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Physical exam

Completely undress the child

- Check the pinnae, frenula, oral cavity, genitals, anus
- Take pictures of injuries
- Review growth

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Physical exam alone not sufficient to rule out abuse

Need to look for occult injury!

Presence of fractures without bruising

Baby with intracranial injury may look like a sleeping baby

Abdominal injury

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The medical work-up

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Purpose of the work-up for abuse = looking for occult injury

Recommended

Potentially Needed

CMP (AST & ALT)
Coags
CBC with platelets

< 6 months	6 months-2 years	2-3 years	>3 years
Skeletal survey	Skeletal survey	Skeletal survey	Thorough physical exam
Blood work	Blood work	Blood Work	Imaging rarely needed
Head CT (wo contrast)	Head CT (wo contrast)	Head CT (wo contrast)	

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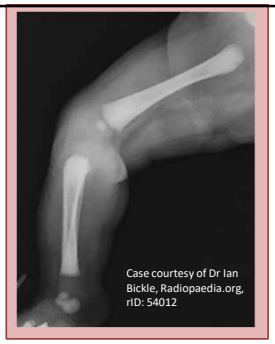
Skeletal survey

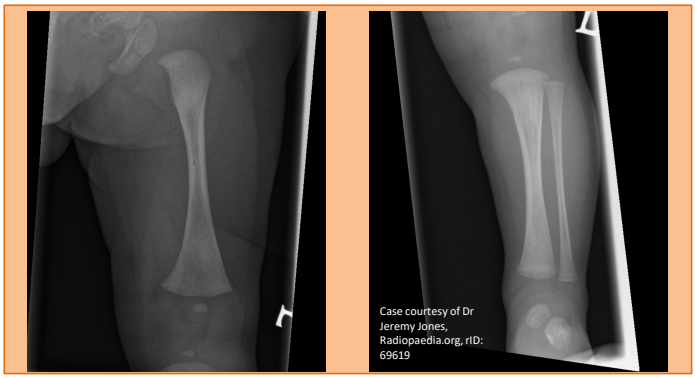
Skeletal survey
- 21 to 22 X-rays
- Dedicated films for all long bones
- Hands, feet
- Pelvis
- Spine
- Head

Needs to be done properly according to ACR standards, may need to be repeated
- Poor quality images
- Missing views
- Inadequate views

Not sufficient for diagnosis



Excellent positioning



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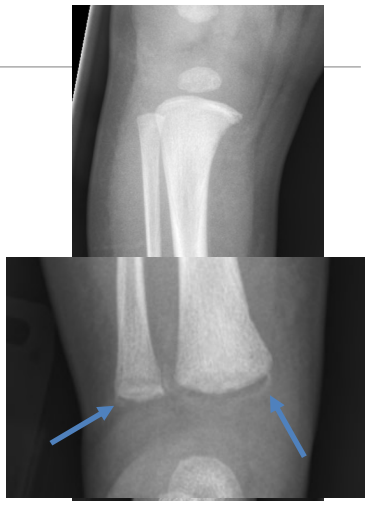
Fractures

Certain fractures have a higher specificity for abuse
- Rib fractures
- CML = classic metaphyseal lesion = bucket handle fracture = corner fracture (same thing just depends on projection)
  - Occur at the end of long bones
  - Fracture through immature bone
- Sternal, spinal scapular fractures- highly suggestive of abuse

Consider accidental mechanisms

Consider mimics like
- Osteogenesis imperfecta
- Menkes Syndrome
- Hyperparathyroidism
- hypophosphatasia
- Fanconi Syndrome



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Fractures concerning for abuse

No history

Not consistent with history/mechanism

Not consistent with developmental stage of child

- Can the child roll over, sit up independently, pull to stand, walk?

Multiple fractures

- Especially in different stages of healing

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Rely on the presence of bruising?

No, you cannot rely on bruising to rule out a fracture

ARCH PEDIATR ADOLESC MED/VOL 162 (NO. 9), SEP 2008
Peters et al

Overlying Bruising?

Fracture Site	Total Fractures, No.	No Bruise or Bruise Not Near Fracture, No.	Bruise Near Fracture, No. (%)
Skull	71	35	32 (45.1)
Face	1	0	1 (100)
Rib	317	298	29 (9.1)
Humerus	33	30	3 (9.1)
Radius	29	26	2 (6.9)
Ulna	19	14	1 (5.3)
Femur	66	55	5 (7.6)
Tibia	64	61	2 (3.1)
Fibula	7	6	1 (14.3)
Spine	4	4	0
Pelvis	1	0	1 (100)
Clavicle	7	7	0
Acromion	2	2	0
Metacarpal	3	3	0
Metatarsal	2	2	0

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A physical exam is not sufficient to rule out abuse

Consider head trauma in an infant that is vomiting without fever or diarrhea

Lack of bruising does not rule out a fracture

Take-away points

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Abusive head trauma

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Abusive Head Trauma

Highest mortality of all forms of child physical abuse
- Rate >20%

Sequelae can include
- Minor behavioral issues to significant neurodevelopmental disabilities

Incidence
- 15 to 30 per 100,000 infants annually in US

Most often occurs <2 years of age

Replaces “shaken baby syndrome”

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Abusive Head Trauma

Shaking of the infant with or without impact

Can see:
- SDH (subdural hemorrhages)
- RH (retinal hemorrhages)
- Rib fractures
- CMLs (bucket handle fractures)

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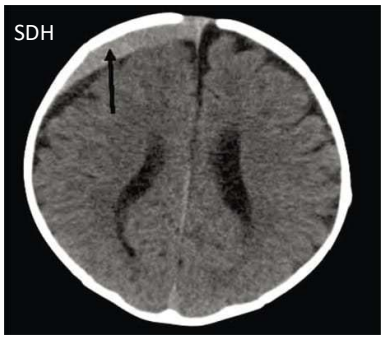
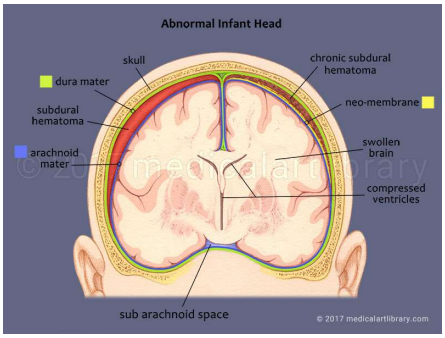
Abusive Head Trauma

- Mimic colic, viral illness, AOM, gastro, reflux and pyloric stenosis
  - Vomiting without diarrhea
- 80% of AHT include Subdural hemorrhages
  - Usually don't have mass effect unless large
  - Cerebral edema occurs from initial injury

Epidural hematomas uncommon presenting sign of AHT

Can also see subarachnoid hemorrhage





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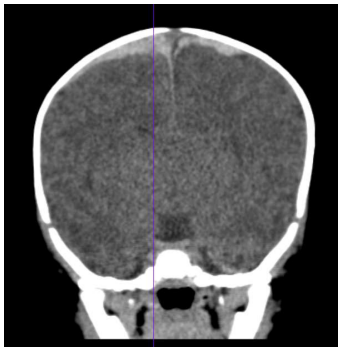
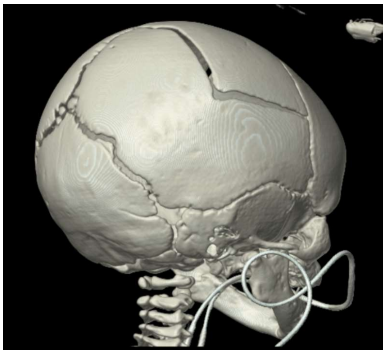
Head CT

Looking for intracranial injury and skull fractures

3D reconstruction necessary to look at skull





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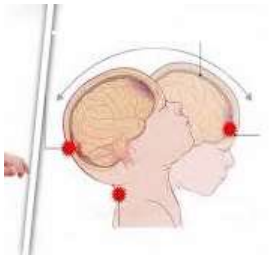

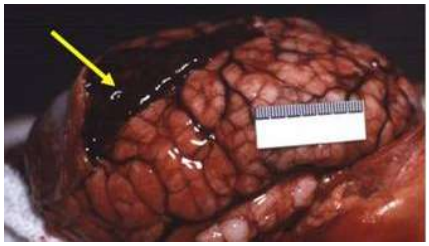

Subdural hemorrhages

Rupture of the bridging veins

Fills a potential space with blood

Can see old and new blood with prior injuries

Does not always require neurosurgical intervention

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The PECARN TBI Rules Do Not Apply to Abusive Head Trauma

Pediatric head trauma- CT or no CT?

The PECARN TBI rules depend on accurate patient/parent history, including the:

- timing of the injury,
- description of mechanism of trauma,
- whether there was a history of loss of consciousness
- in those younger than 2 years, whether the parent feels that the child is behaving normally at the time of ED evaluation

Magana JN, Kuppermann N. The PECARN TBI Rules Do Not Apply to Abusive Head Trauma. Hess EP, ed. *Acad Emerg Med*. 2017;24(3):382-384. doi:10.1111/acem.13155

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Chest and Abdominal Injuries

Abdominal trauma is 2nd leading cause of fatalities due to child physical abuse (AHT is 1st)

Signs and symptoms may be subtle or overlooked

Peak age is 2-3 years

Do laboratory screening

- If AST or ALT > 80 proceed to abdominal CT (this is the preferred modality)
  - Values rise and fall quickly
- Consider lipase or UA for hematuria

Most commonly injured organs are liver and spleen then duodenal and proximal jejunal ruptures or hematomas, pancreatic injury, vascular renal trauma

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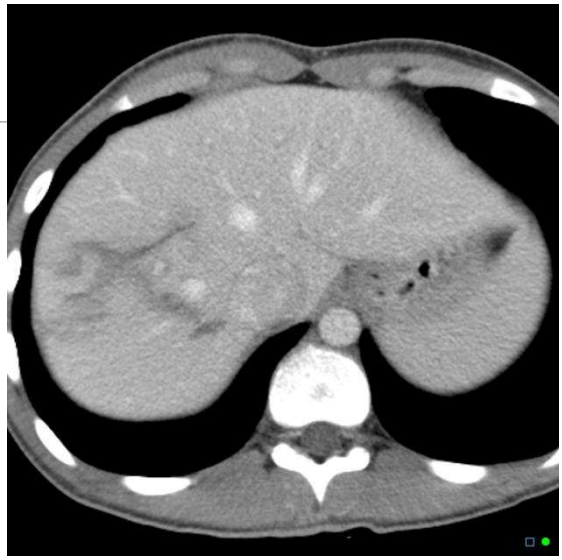
Abdominal Injury

Looking for:

- Liver laceration
- Other solid organ injury (Pancreas, kidney, etc…)
- Duodenal hematoma
- Vascular injury
- Mesenteric injury

Rare to see abdominal bruising!



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Babies are terrible historians therefore a thorough work-up is required to look for occult injury

PECARN does not apply in situations in which abuse should be on the differential

Take-away points

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How to make a report to child protective services

Maine DHHS 1-800-452-1999

You only need **suspicion**

- Do not need to be able to *prove* it- that is what DHHS and law enforcement will investigate

Anonymous or not?

- Comfort level- BUT I would encourage giving name and credentials, this carries weight and allows follow-up

Be clear and specific about your concerns

- Don't equivocate
- Don't say "I'm only doing this because I have to"
  - You never know if the family has previous history or risk factors unknown to you

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§4011-A. Reporting of suspected abuse or neglect

Children under 6 months of age or otherwise nonambulatory. A person required to make a report under subsection 1 shall report to the department if a child who is under 6 months of age or otherwise nonambulatory exhibits evidence of the following:

A. Fracture of a bone; [PL 2013, c. 268, §1 (NEW).]

B. Substantial bruising or multiple bruises; [PL 2013, c. 268, §1 (NEW).]

C. Subdural hematoma; [PL 2013, c. 268, §1 (NEW).]

D. Burns; [PL 2013, c. 268, §1 (NEW).]

E. Poisoning; or [PL 2013, c. 268, §1 (NEW).]

F. Injury resulting in substantial bleeding, soft tissue swelling or impairment of an organ. [PL 2013, c. 268, §1 (NEW).]

This subsection does not require the reporting of injuries occurring as a result of the delivery of a child attended by a licensed medical practitioner or the reporting of burns or other injuries occurring as a result of medical treatment following the delivery of the child while the child remains hospitalized following the delivery.

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After the call

DHHS uses a structured decision-making tool based upon certain data to determine risk

- Wording is important

Screened in or screened out

- Screened out because abuser is not caregiver, does not rise to level of risk for an investigation
- Not enough information
- If screened in → 24- or 72-hour response

You can call back and add information

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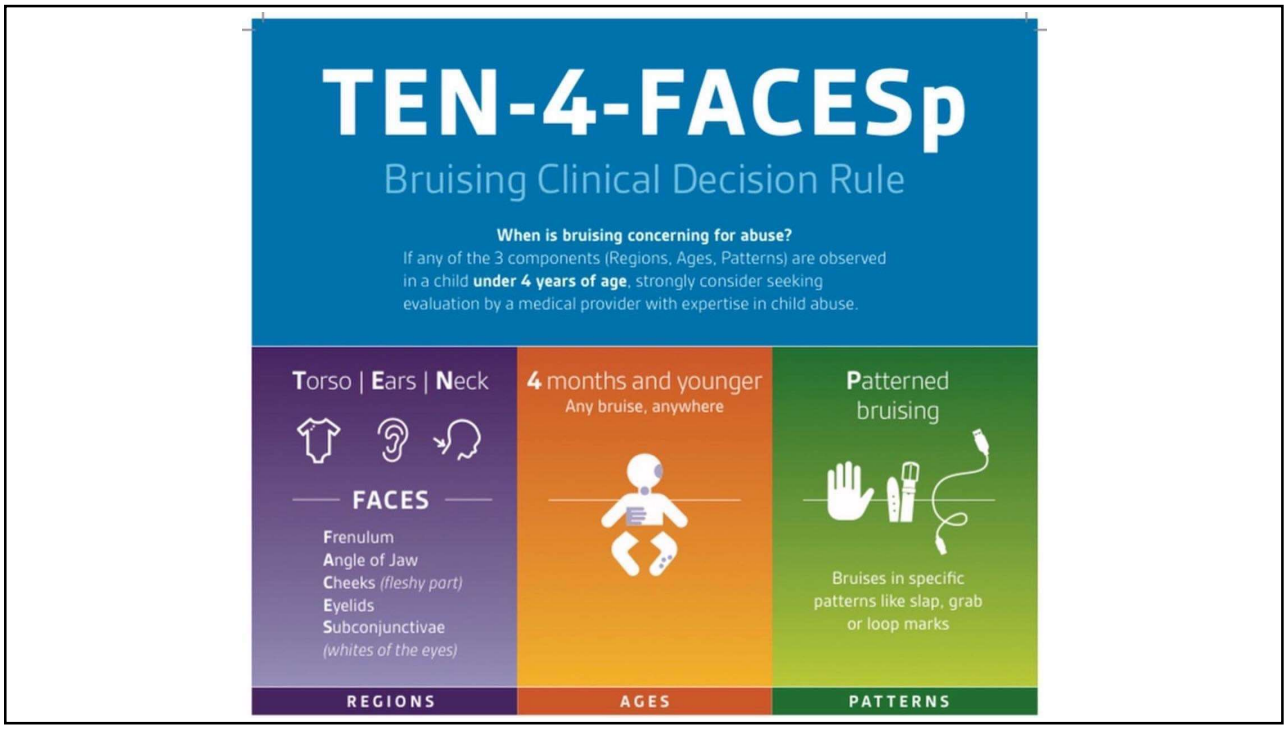

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Five take home points

Bruising on infants is a big deal.
- Remember TEN 4 FACES-p
- Indicator of a potentially unsafe environment
- Almost always should result in a physical abuse work-up

A physical exam alone is not sufficient to rule out abuse

Lack of bruising does not rule out a fracture

PECARN does not apply in situations where abuse should be on the differential

Bruising cannot be dated based on color

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Contact information

Spurwink Center for Safe and Healthy Families

207-879-6160

Monday-Friday 8am- 4:30PM

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References

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