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## Overview

- Discuss the impact of child maltreatment
- Review responsibilities as a mandated reporter
- Discuss the concept of "sentinel injuries"
- Review patterns of injuries that raise concern for child physical abuse.
- Explore the pathophysiology of abusive head trauma
- Highlight your unique role as a first responder
- Review the recommended "injury surveillance" work up.

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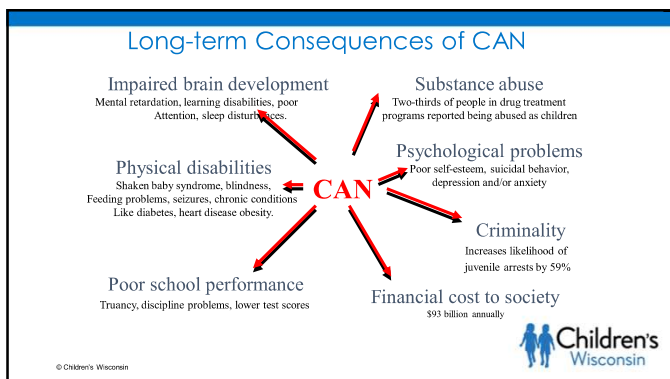
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## Scope of the problem

- 4398 children were victims of abuse in WI in 2019
- 26 children died in WI in 2019 due to Maltreatment
  - 77.8% were younger than 3 years
  - 48.1% were under age one.



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## North Central Wisconsin Statistics 2019

County	Total reports of Abuse	Substantiated cases	Reports of PA	Substantiation rate
Clark	225	5	59	8.5%
Forest	112	0	27	0
Iron	68	3	16	18.8%
Langlade	322	4	20	20%
Lincoln	192	5	47	10.6%
Marathon	945	12	58	20.7
Oneida	244	3	40	7.5%
Portage	423	3	105	2.9%
Price	95	5	23	21.7%
Taylor	130	1	41	12.8%
Vilas	181	7	32	6.3%
Wood*	737	18	141	12.8%




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## Environmental Risk Factors

- Domestic violence
- Drug and/or alcohol abuse
- Social &/or Physical Isolation
- Stressors related to Poverty



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### Risk factors for PA: Caregiver

- Abuse in childhood
- Young/immature parents
- Limited knowledge of child development
- Low self esteem/depression
- Mental Illness
- Poor impulse control/anger management skills

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### Who are we most likely to over look?

- Very young children
- Caucasian families
- Intact families
- Families perceived to be similar to our own
- "Nice" parents

Jenny, C. et al. JAMA, 1999;281(7):621.

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### No "typical child abuser"

- Child maltreatment occurs in all races, religions, and socioeconomic groups
- It is human nature to try and explain away something as unpleasant as child abuse
- Only diagnosis that comes along with an accusation
- ABCA

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## Definition of Physical Abuse WI Statute 948.03

- Intentional causation of bodily harm
- Reckless causation of bodily harm
- Failing to act to prevent bodily harm
- Different felony classes based on degree of harm



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## Neglect

- Neglect: "Failure, refusal or inability on the part of a parent, guardian, legal custodian or other person exercising temporary or permanent control over a child, for reasons **other than poverty**, to provide necessary care, food, clothing medical or dental care, or shelter so as to **seriously endanger the physical health of the child**"
- Neglect is the most prevalent form of abuse.



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## Statute 48.981 Mandated Reporting

- Any of the following persons who has reasonable cause to suspect that a child seen by the person in the course of professional duties has been abused or neglected OR has reason to believe that a child seen by the person in the course of professional duties has been threatened with abuse or neglect and that abuse or neglect of the child will occur shall report as provided in sub. 3.
- Exception related to reproductive health.
- Emergency medical responder is on the list along with nurses, doctors, teacher and many other professionals.



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## Mandated Reporting

- Must contact authorities when you have reasonable cause to **suspect** that a child **seen in the course of professional duties** has been abused or neglected OR
- When you have reason to believe the child has been threatened with abuse or neglect and that abuse or neglect of the child will occur.



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## Mandated Reporting (Continued)

- Must contact the department of social or human services OR
- The sheriff or city, village or town police department
- Contact social services where the child lives
- Contact law enforcement in the community where the offense occurred
- Anyone making a report in good faith is immune to criminal or civil liability.
- However, persons required to report who intentionally fail to report suspected child abuse or neglect may be fined up to \$1,000 or imprisoned up to 6 months or both.



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## What have we learned so far?

The effects of abuses are serious and long lasting  
There is not "typical abuser"

It is more than likely that the people attending this presentation are required by law to report abuse.

How do I begin?




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## Sentinel [sen-tn-l]

1. A person or thing that watches or stands as if watching
2. A soldier stationed as a guard to challenge all comers and prevent a surprise attack

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### Sentinel Injuries in Infants Evaluated for Child Physical Abuse (Sheets et al. 2013)

- Retrospective study of 401 infants under the age of 12 mo who were evaluated for abuse at the hospital
- They were classified as having definite, intermediate concern for abuse, or no abuse.
- Sentinel injury defined as previous injury reported in the medical record that was suspicious for abuse. (bruises, intraoral injury or fracture)
- In the 200 "definitely abused" group 27.5% had a previous sentinel injury
- 8% of the group with intermediate concern and none of the non-abused group had a previous sentinel injury

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## Sentinel Injuries



- Minor injuries seen on infants is uncommon and should raise suspicion for abuse.
  - Infants who don't cruise should NOT bruise.
- These minor injuries often precede larger abusive events. Can be very subtle
- Most common include bruising and intraoral injuries. Could include fractures or subconjunctival hemorrhages.
- These types of injuries should prompt a medical evaluation.



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## Sentinel Injuries



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## Sentinel Injury Case study.



- **Sentinel Injuries often precede major abusive events**
- 1 month old: brought to urgent care after parents noted blood from his mouth after returning from daycare. Had a torn frenulum-no reports made
- 2 months old: mother notes blood in spit-up after picking up from daycare. PCP finds scab in patient's nose. No reports made
- 2 ½ months old: patient presents to hospital with seizures. Head CT shows severe brain bleed and too numerous to count retinal hemorrhages.



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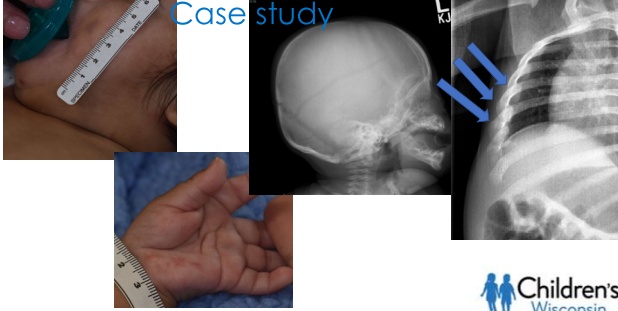
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Case study



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I have found the sentinel injury, now what do I do?

- Make a report to CPS or Law Enforcement
- Injury Surveillance
  - Skeletal Survey for children under 2.
  - Head CT if the child is less than 6 months
  - Bleeding Studies if the injury is a bruise
    - CBC with diff, PT, PTT, Von Willebrand Screen, ALT, AST, Amylase, Lipase
- Inform the parent about what you're doing and why
- Even if other injuries are not found and abuse cannot be substantiated, the process of identifying the injury and investigating can stop the behavior.

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Evaluation begins before you lay your hands on the patient.

- What is the environment like?
  - Medications accessible? Drug paraphernalia? Overturned furniture?
- What is the reaction of the adults?
  - Is it in line with the seriousness of the situation
  - Who is present that may serve as a witness.
- What does the patient look like? Clothing, what room are they in, blood or emesis present. Any visible injuries?
- Does anyone else have injuries.

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## History

- Obtain and record a good history of the injury.
  - How high, what kind of floor, how did they land?
- When was the last time they were normal?
- What does the child say happened?
- How did the parent respond? Did they seek treatment?
- When possible, interview the parent and the child separately.
- Do not ask leading questions or provide a history to the parent.



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## History

- Obtain a good medical history
  - Medical conditions
  - Bleeding disorders, Bone Disease
  - Birth history, Vit K
- Question patient or family about medications
- Ask about child's development
  - Can they roll, cruise, run, climb?
  - Do they have any delays?
  - Are they toilet training?



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## Accidental Bruising

- Tends to occur over bony prominences (forehead, knees, shins)
- Singular
- Usually located on front of the body
- Usually involves the extremities
- Should be consistent with the history



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## Non-Specific Bruising




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## Suspicious Bruising

- Patterned injuries
- Clusters of bruising
- Bruises of different colors indicating different stages of healing
- Bruising that does not match the history




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## Suspicious Bruising based on location

- Genital area
- Bilateral bruising
- Torso
- Ears
- Neck




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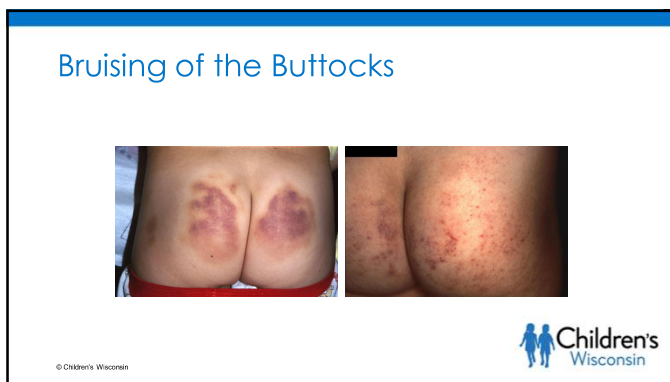
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## Patterned Injury: Slap injury



- Located on side of face. May extend past hair line.
- Area under the fingers is spared.
- Bruising occurs between the fingers where the blood is forced out of the vessels.



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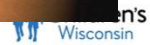
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## Bite Mark



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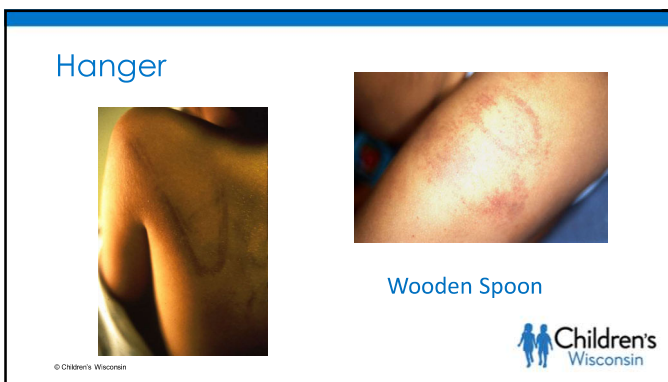
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## Bilateral Black Eyes



- Consider basilar skull fracture
- Neuroblastoma
- Injury to forehead
- Look for injury to surrounding tissue




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## Loop Marks

- Patterned injury which is caused by being whooped with a folded cord or belt.
- Diagnostic of inflicted injury
- Difficult to tell how old they are
- When they are present on the arms, they often are defensive wounds
- Often have sparing down the center of the line



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## Looped Injuries



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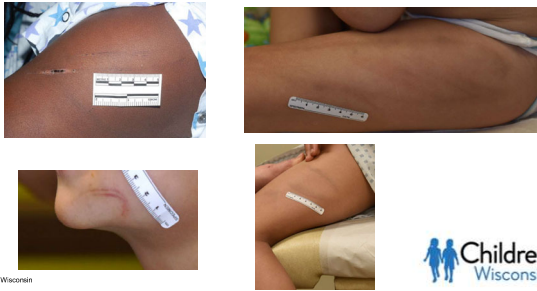
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## Patterned Looped Injury



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## Congenital Dermal Melanocytosis (Mongolian Spots).



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- Birthmarks
- Seen primarily in dark skinned children but can be found in any race
- Dark grey or greenish macules
- Uniform in color
- Often located over lower back, buttocks, shoulders, wrists, and ankles

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## Burns in Children

- Many accidental burns are related to lack of supervision
- Scald burns
  - Accidental
    - Burn starts near the head. Burn is most severe there
    - Burn depth decreases as the fluid flows away from the source
    - Will often see a "drip pattern" than ends in a point.
- Immersion burns
  - Body part is held in the water
  - Burn has a "sock" or "glove" distribution
  - Sharp line of demarcation or "tide line"
  - May be sparing in the creases of the skin or where the buttocks touches the porcelain.
  - No splash marks

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## Burns

When investigating a burn **DO NOT** alter the water heater setting until scene investigation is complete.

Submersion Burn

Accidental Burn



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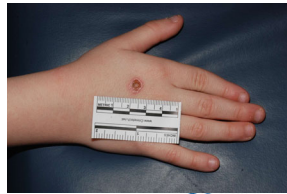
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## Cigarette Burn

- Often occur in clusters
- Typically are 8 to 10 mm in diameter
- Are round with a cratered center and dark perimeter
- Can be confused with many other things when they heal.
- Accidental cigarette burns are superficial and not distinctly round.



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## Burns



- What do you think this burn is from?

- Scald
- Hot surface
- Laxatives

Senna interacts with the stool and can cause a chemical burn when it comes in contact with the skin. Burn has a "diamond shape"

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"Rose is a rose is a rose is a rose."  
Gertrude Stein 1913

- BUT a fracture is not a fracture is not a fracture. Judy Walczak 2021



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- Clavicle Fracture
  - "Collar bone"
  - Can happen in childbirth
  - Position makes it prone to injury
  - Not exclusive to accidents



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- Toddler fracture
  - Non-displaced spiral fracture of the mid-tibia
  - Occurs when children are learning to walk
  - Sudden onset of a limp



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## Types of Fractures

- Metaphyseal Fracture
- Diaphyseal Fracture
- Skull Fracture
- Rib Fracture

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## Metaphyseal Fractures

### Classic Metaphyseal Fractures (CML)

- Found at the end of the long bone near the growth plate
- More concerning for abuse
- Caused by tension on the end of the bone
  - Flailing limbs caused by shaking
  - Yanking on limbs
  - Forcing joints into extension
- Not usually seen beyond one year of age.
- Not associated with swelling. May use extremity normally.



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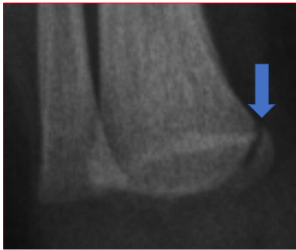
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## Corner Fracture (CML)



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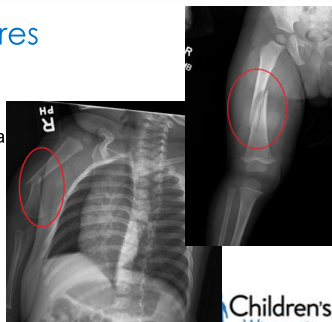
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## Diaphyseal Fractures

- Involves the shaft of the long bones
- Can be seen in abuse **or** trauma
- Transverse or Oblique. Type of fracture reflects mechanism.
- History should support the mechanism required
- Always more concerning in an infant



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## Skull fractures



- Most common fracture seen in children.
- Can be the result of a short fall.
- Simple versus complex
- Cannot be dated
- Child may not be brought in for evaluation right away.
- Can be confused with a suture

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## Rib fractures

- Highly concerning for abuse
- Caused by vigorous squeezing of the chest or a direct blow
- Can be anterior, posterior, or lateral
- Rare in childbirth and CPR
- When you find them, look for other fractures.

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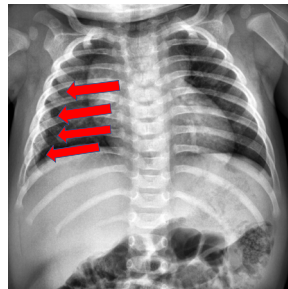
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## Rib Fractures



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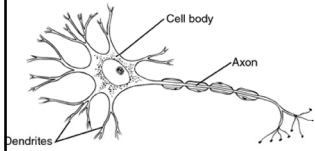
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## Understanding Abusive Head trauma



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- An infant's brain does not fill up the skull and has the ability to shift around
- When an infant is shaken or slammed with violent forces, it causes the brain to move due to inertia. This can cause **diffuse axonal injury**.
- It can also cause tearing of the bridging veins.




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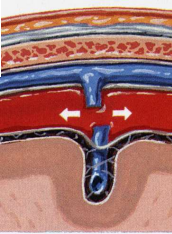
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## Abusive Head Trauma



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- This causes slow bleeding into the subdural space which is irritating to the meninges. This leads to fever and irritability.
- The trauma to the brain tissue leads to edema or swelling.
- Severe swelling will eventually interfere with the brain's blood supply.




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- Mixed density bilateral subdurals collections with blood products.
- 7 mo old male
- Presented with altered mental status and history of vomiting.




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## Retinal Hemorrhages

- Retinal hemorrhages are uncommon in typical trauma
- The classic pattern for abusive head trauma is hemorrhages too numerous to count in multiple layers out to the periphery.
- Why we see them with abusive head trauma is not clear
- Can be seen after childbirth



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## Child Abuse Triecta



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## Child Protector App



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## Summary

- The younger the child, the greater the risk.
- Any injury in an infant that is not yet cruising should raise concern for abuse.
- Abuse does not need to be proven for cases to be reported to investigators.
- Abuse occurs in all kinds of families.



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## Resources

Dr. Carolyn Nash  
715-847-3575  
Dr. Kristen Iniguez  
Marshfield Clinic  
715-387-5511  
North Central Wisconsin Child Advocacy Center  
715-848-8600

Children's Transport serves Wisconsin, northern Illinois and the upper peninsula of Michigan. The team also travels across the U.S. bringing patients to Children's Wisconsin.

Call (414) 266-2460 or toll free (800) 266-0366  
Pediatrics specialists are available for consultation or assistance in the transfer process.

If a referring physician only needs to talk to a pediatric specialist, that can be done while the physician waits on the line. If a decision is made to transport a child, call center staff will mobilize the Transport Team.



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## References

- Christian, C. W. (2015). The evaluation of Suspected Child Physical abuse. *Pediatrics*, e1337.
- Eismann EA, S. R. (2020). Identifying Predictors of Physical Abuse Evaluation of Injured Infants. *Pediatric Emergency Care*, 1-7.
- Jenny C, H. K. (1999). Analysis of missed cases of abusive head trauma. *JAMA*, 621-626.
- Joffe M, L. S. (1988). Stairway injuries in children. *Pediatrics*, 457-461.
- KW, F. (1992). Patterned abusive bruises of the buttocks and the pinnae. *Pediatrics*, 633-636.
- Sheets LK, L. M. (2013). Sentinel injuries in infants evaluated for child abuse. *Pediatrics*, 701-707.
- Sugar NF, T. J. (1999). Bruises in infants and toddlers: those who don't cruise rarely bruises. *Arch Pediatric Adolesc Med*, 399-403.




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### Prevention Websites

- Child Protector App
- Prevent Child Abuse America
  - [Preventchildabuse.com](http://Preventchildabuse.com)
- Prevent Child Abuse Wisconsin
  - [Childrenswi.org](http://Childrenswi.org)



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