Disclosure Information for:

Lynn K. Sheets, MD, FAAP

Birth Injuries & Neonatal Skin Conditions – When to Worry About Abuse

- There are no relevant financial relationships related to this presentation/program
- There is no sponsorship/commercial support of this presentation/program
- The content being presented will be fair, well-balanced and evidence-based
- Learners who wish to receive Continuing Education Credit (CME/CLE/CE) must complete and turn in evaluations to successfully complete this program

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Speaker Biography – Dr. Sheets

Lynn K. Sheets, MD, FAAP is a Professor and Section Chief in the Department of Pediatrics at the Medical College of Wisconsin (MCW) and Medical Director of Children's Hospital Wisconsin's (CHW) Child Advocacy and Protection Services (CAPS). Her career began in 1988 as the medical director of the child abuse program at the University of Kansas Medical Center where she co-founded the first Child Advocacy Center in Kansas and co-led development of a joint nursing and medical student elective in family violence. Dr. Sheets has led the CAPS program at CHW since 2006 and was instrumental in developing the accredited child abuse pediatrics fellowship at MCW which was one of the first in the nation.

She is board certified in pediatrics and child abuse pediatrics. In addition to providing clinical services, educating others and leading research, she is the Chair of the Wisconsin Child Death Review Executive Council and part of the AAP national council; she cofounded the Wisconsin Child Abuse Network (WI CAN). Dr. Sheets served on the Wisconsin American Academy of Pediatrics Board of Directors. In 2013, she received the prestigious Ray E. Helfer MD Award from the National Alliance of Children's Trust and Prevention Funds and the American Academy of Pediatrics. In 2014, the Legal Aid Society of Milwaukee awarded Dr. Sheets the Equal Justice Medal for her work in advocating for poor and vulnerable children and families. She was honored as one of the Milwaukee Business Journal's 2019 Women of Influence in the category of 'Inspiration.' She has a strong commitment to the prevention of child maltreatment and the development of trauma-informed approaches to improve child, family, workforce and community resilience.

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Disclaimers:

- This lecture is not intended as legal advice and should not replace legal consultation
- Presentation contains disturbing scenarios
- Cases have been de-identified through a variety of methods

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Learning Objectives

- Describe risk factors for abuse of a neonate and understand that risk factors are not very useful when evaluating the individual patient/client
- List infant skin findings that should raise concerns for child physical abuse
- List skin findings that could be confused with abusive injuries

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Outline

- Cognitive errors as a barrier to recognition including the cognitive errors that bias creates
- Overview of birth injuries – Skin findings are the focus of this lecture (this is not a review of all birth injuries)
- Bruises and skin findings – when to worry

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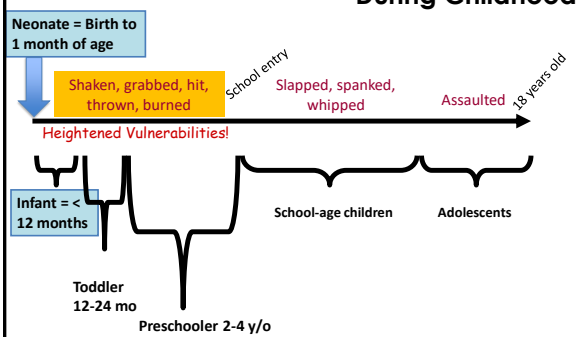
Spectrum of Physical Abuse During Childhood



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Why Discuss Abuse In The Neonate and Young Infant?

- Neonatal abuse – likely under-recognized (cognitive error that newborns, especially those in "nice families" are not abused
- Can happen in a home or, rarely, in the hospital setting
- Many skin mimics
- Much of abuse is preventable – recognize risk factors and help parents prevent

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Risk Factors

- Helpful in prevention efforts that will have the highest impact
- Have intrinsic biases and promote cognitive errors if used incorrectly
- Help with understanding causation in some cases
- ARE NOT HELPFUL in assessing whether the condition is present

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Risk Indicators for Abuse = Understanding But Not Applicable at the Individual Level

- Child
  - Prematurity
  - Temperament—colic, fussy
  - Chronic illness
  - Developmental disability
  - Unwanted
  - Multiple gestation

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Risk Indicators for Abuse (continued)

- Parent
  - Young
  - Mental health condition
  - Substance abuse
  - Poor impulse control
  - History of abuse as a child
  - Lack of social support
  - Poor knowledge of normal child development
  - Major stress

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Risk Indicators for Abuse (continued)

- Family
  - Intimate partner violence
  - Single parent
  - Poverty
  - Unemployment
  - Nonbiologically related adult living in the home
  - Mental health or substance abuse problems

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Risk Indicators for Abuse (continued)

- Community/society
  - Community violence
  - Lack of affordable, quality child care
  - Absence of community activities
  - Lack of government support for social welfare programs

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Risk factors + Trigger ➡ Infant Abuse

Infant Crying!

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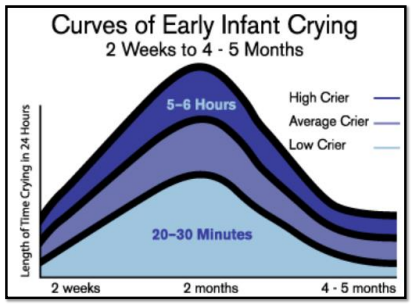
Crying Curve

Accessed on 8/13/21*



* http://purplecrying.info/sub-pages/crying/why-does-my-baby-cry-so-much.php

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Infant crying

- Normal developmental stage – peaks around 6 weeks of age (Hunziker, U. A., & Barr, R. G. (1986). Increased carrying reduces infant crying: A randomized controlled trial. Pediatrics, 77, 641–648)
- May indicate something is wrong but not always
- Opioid crisis – neonatal abstinence and crying
- Causes stress and anxiety for caregivers- feelings of frustration, inadequacy, anger
- Abusive caregivers – unable to regulate the stress that is elicited by infant crying (McCanne, T. R., & Hagstrom, A. H. (1996). Physiological hyperreactivity to stressors in physical child abusers and individuals at risk for being physically abusive. Aggression and Violent Behavior, 1, 345–358.)
- 89% of parents contacted the PCP because of excessive crying prior to AHT (Talvik, I., Alexander, R. C., & Talvik, T. (2008). Shaken baby syndrome and a baby's cry. Acta Paediatrica, 97, 782–785)

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Risk! Opioid Crisis and NAS

- Neonatal Abstinence Syndrome (NAS)
  - Tremors
  - **Excessive** or **high-pitched crying**, **irritability**, yawning, stuffy nose, sneezing, **sleep disturbances**
  - **Poor feeding and sucking, vomiting, loose stools,** dehydration
  - **May seem sick** with fever, sweating

Hudak ML, Tan RC, Committee on Drugs, et al. Pediatrics. 2012;129;e540-60.

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Common Land Mines in Recognition of Abuse

- Human nature dictates that unintentional injury is the most likely diagnosis. All of us have an inherent COI – our work is easier if it is not abuse.
- Even if aware of your own biases, it is challenging to resist their influence. ("Nice family")
- The human mind has a tendency to fill in gaps in the history and make assumptions. ("I could see how that could happen . . .")

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"ABA" Bias – Anything But Abuse

- Abuse should be considered in any injury of a child
- ***Pay attention*** to the fleeting thought that injury is unexpected!
- Consult a colleague to check your thinking
- Conduct regular peer review (child abuse pediatrics) and/or establish practices of reflective supervision
- Consult a child abuse medical expert early if unsure
- If reasonable suspicion for abuse or neglect, report!

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Neonatal Injuries

- What is a "neonate" Newborn less than 4 weeks old
- Birth injuries vs. unintentional injury vs. abuse vs. condition that can be confused with injury
- Birth injuries common

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Birth – A High-Risk Journey!

- Common birth injuries (partial list)
  - Nasal septum (bony/cartilaginous) (1955 Kirchner, AMA J of ENT)
  - Caput – swelling of the presenting part
  - Cephalohematoma – bleeding under one of the bony plate membranes
  - Subconjunctival hemorrhage
  - Bruising from instrumentation – vacuum, forceps
  - Fractures – clavicle most common, other
  - Nerve injury – associated with shoulder dystocia

Birth injuries in Neonates – G Akangire and Carter B in PIR 2016Vol. 37 No. 11 NOVEMBER 2016

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Birth Injuries

- Range from minor to severe
- Causes can be from the birth process to instrumentation to medical care at birth
- Risk factors – macrosomia (large baby), instrumentation (forceps or vacuum increase birth injury risk by 3-4x), scalp electrode)

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Birth Injuries (PIR Nov 2016;37(11) Akangire G and Carter B)

TABLE 1. Risk Factors for Birth Trauma and Associated Injury

RISK FACTORS	RELATED INJURIES
Forceps delivery	Facial nerve injuries
Vacuum extraction	Depressed skull fracture, subgaleal hemorrhage
Forceps/vacuum/forceps + vacuum	Cephalohematoma, intracranial hemorrhage, shoulder dystocia, retinal hemorrhages
Breech presentation	Brachial plexus palsy, intracranial hemorrhage, gluteal lacerations, long bone fractures
Macrosomia	Shoulder dystocia, clavicle and rib fractures, cephalohematoma, caput succedaneum
Abnormal presentation (face, brow, transverse, compound)	Excessive bruising, retinal hemorrhage, lacerations
Prematurity	Bruising, intracranial and extracranial hemorrhage
Precipitous delivery	Bruising, intracranial and extracranial hemorrhage, retinal hemorrhage

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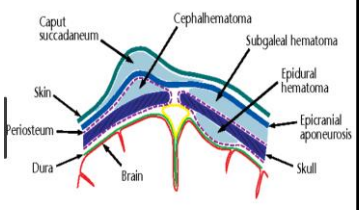
Battering Ram – Head Injury

- Cephalohematoma – 1-2% of all deliveries
- Subgaleal hemorrhage – relatively rare; higher in vacuum; can be life-threatening with 40% blood volume lost – 14% mortality
- Extra-axial hemorrhage – 25 - 50% of newborns (Rooks 2008 and Looney 2007)



Sheikh, A. M. H. Public domain with credit.

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COMMON SKIN LESIONS PRESENT AT BIRTH

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Birth Injuries

- Common birth injuries include generalized bruising, iatrogenic bruising (forceps, electrodes, vacuum), subconjunctival hemorrhage
- Bruise mimics are also common
- Birth injuries should be documented
- Consider asking to see photos of the newborn if you are unsure

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Subcutaneous Fat Necrosis

- Likely due to pressure on subcutaneous tissue
- Ischemia (lack of adequate blood flow)
- Resolves without treatment by 6-8 weeks

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BRUISING – WHEN TO WORRY IN THE NEONATE

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Mimic of abuse and demonstration of blanching

- If the lesion won't blanch, it **could** be a bruise or something else
- Non-blanching 'marks'
  - Bruise
  - Dyes (these wipe or wear off unless deep in the skin = tattoo)
  - Skin pigment
    - blue spots of infancy
    - Nevi (moles)
    - Post-inflammatory hyperpigmentation

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Precise Dating of Bruises Is Inaccurate!

- Bruises Can Go Through Color Changes with Healing But Not Always
- Bruises Heal

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Sick Infants and Bruising

- Expected from medical procedures – extremely premature at highest risk from minor procedures
  - Needle/heel sticks
  - Petechiae from tourniquet
  - Tape
- Bruising in ANY location without a recent medical procedure in that location should raise concerns for abuse
- Bruises cannot be dated with accuracy!

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Location Matters

- Bruises from handling a sick neonate are more likely over bony prominences
- Unexpected or unusual locations include:
  - Palms
  - Soles or heel without a recent needle stick
  - Neck
  - Abdomen
  - Soft, padded areas - buttocks or cheeks
  - Inner aspects of upper arms or thighs
  - Ears

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When to Worry

- Bruising is not expected in normal infants until they start to cruise
- Sick neonates - bruise is in an unexpected location, not associated with medical treatments, or has a pattern, or happens only with one caregiver
- Patterns to know
  - Palms – from fingers 'digging' in when hand is squeezed^
  - Squeezing bruises*
  - Fingertip contusions or grabbing bruises
  - Bites
  - Pinch

*Ruiz-Maldonado TM, Johnson KL, Sabo JL, Sheets LK, Laskey A. Palm Bruising in Infants: A Recognizable Pattern of Abuse. J Emerg Med. 2021 Mar 29:S0736-4679(21)00153-0. doi: 10.1016/j.jemermed.2021.02.018. Epub ahead of print. PMID: 33795168

^Petska HW, Frasier LD, Livingston N, Moles R, Sheets, LK. Patterned Bruises from Abusive Squeezing. *Ped Emerg Care*. Published in print 6/1/21 PMID: 30624423

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EDUCATE CAREGIVERS AND PROFESSIONALS ABOUT SENTINEL INJURIES

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Sentinel Injuries

- Bruising is **not normal** in healthy, young infants
- Sentinel injuries are unexpected, poorly explained, minor injury in a pre-cruising or young infant concerning for physical abuse
  - Bruise
  - Intra-oral injury such as a frena injury
  - Subconjunctival hemorrhages (red spots in the whites of the eyes)
- Injuries other than abrasions are rare in pre-cruising, non-abused infants
- Often precede more serious abuse

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Learn About Sentinel Injuries

- http://uwm.edu/mcwp/sentinel-injuries/
- 25-minute module developed in collaboration between CHW, Milwaukee Child Welfare Partnership, WI DCF, CANPB, and UWM Helen Bader School of Social Welfare
- Sentinel Injuries are severe and warrant a same day, urgent response

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Consider Alternatives

- Does it blanch? If so, it is not a bruise!
- Skin erythema due to inflammation – blanches
- Injury from birth
- "Birthmarks"
  - Vascular
  - Benign blue spots of infancy (AKA "Mongolian" spots)
  - Café-au-lait
  - Other
- Other

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Documentation

- Avoid words that minimize the injury or lack specificity such as "mark" or others vague words used in medical reports
  - "Vascular staining"
  - "Bruise-like macules"
  - "Purple macules"
  - "Bruising/abrasion" – which is it?
  - "Bruising erythema"
- If it is a bruise, document that then take appropriate actions. Bruise = contusion
- If unsure, then "mark" is appropriate

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Additional References

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Additional References – also see slides

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