

CHILD PHYSICAL ABUSE – Practical Pearls

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NOTE: These are some take-home thoughts and concepts meant to remind you of points made during the lecture and save you the trouble of taking notes; they cannot replace consultation with your local child abuse medical provider regarding an individual case.

Working with medical providers as an investigator:

- A. Information you may receive from the medical provider
 - a. What injuries does the child have
 - b. What type(s) of mechanism(s) typically cause these injuries
 - c. What problems may these injuries cause for the child
 - d. What is being done to medically evaluate and treat the child, including evaluation for nonabusive causes
 - e. What history was provided for the injuries at the time the child presented for care
 - f. What is the likelihood that the history provided is a plausible explanation for the child's findings, including child's developmental ability to perform the actions reported in the history
- B. Information the medical provider may appreciate receiving from you
 - a. Details about the physical circumstances at the scene which may support or refute the history
 - b. Details from other witnesses/informants which may support or refute the history
 - c. History with authorities for patient or family
 - d. Alternative histories that arise during investigation which may need to be considered
 - e. Concerns about other children who may need medical evaluation

Bruises:

- A. Bruises are common accidental childhood injuries, as well as the most common injury in child physical abuse.
- B. MYTH BUSTED: Bruises cannot be dated by color.
 - a. →Some bruises have yellow coloration within 18 hours and some bruises look bright red for days or weeks. In most cases, stating an opinion about the age of a bruise based on its appearance/color is not supported by the evidence.
- C. MYTH BUSTED: Babies do not bruise easily. Their skin has better elasticity than adults' and is quite resilient.
- D. ANY body part having bruising in a premobile infant, meaning one who cannot pull to stand and move around in a standing position, is highly unusual and warrants further investigation and evaluation for possible abuse
 - a. Remember, 'those who don't bruise rarely bruise'

- E. Areas of the body commonly bruised in children (note: bruising in these areas is not automatically accidental, if a clear history of an abusive origin is given): bony prominences, ie places on the body where the bone is close to the skin
 - a. Shins, knees, elbows, forearms, forehead in toddlers
- F. Areas of the body rarely bruised in children (note: bruising in these areas is not automatically abusive, if a clear and plausible history of an accidental mechanism is given): protected and well-cushioned areas of the body
 - a. Face other than bony prominences, ears, neck, torso, abdomen, buttocks, genitals, thighs, upper arms
- G. Any bruises with a pattern, ie that reflect the shape of an object, are concerning for abusive injury
 - a. There are occasionally plausible accidental histories for patterned bruising, but they usually involve a plausible history of a high-force mechanism, ie seatbelt signs after a car accident
 - b. Common objects producing patterned bruises in physical abuse: hands, belts, cords, switches, kitchen implements, shoes
- H. MYTH BUSTED: Fatal head injury to children, especially infants, can occur without ANY bruising or other external signs of trauma on the skin.

Burns:

- A. Inflicted burns peak in toddlers – common triggers are behavior and toileting frustration
- B. The most common type of accidental burn in children is a scald (burn with hot liquid).
- C. The most common type of abusive burn in children is also a scald.
 - a. →The distinction between accidental and abusive scald burns must be made by history and physical exam in most cases.
 - b. Features of a scald burn that are more associated with abusive injury are uniform depth, sharply demarcated edges, bilateral and symmetrical distribution (burns that look the same on any body part that there are two of – sock/glove distribution)
 - c. Accidental scald burn patterns demonstrate MOVEMENT – of the child who is sustaining this very painful injury, and of the liquid which is spilled or splashed
- D. Scene information which may be helpful in assessing a scald burn, particularly sink or bathtub scalds
 - a. Maximum water temperature, how fast water reaches maximum temperature, depth of water and tub, type of knobs or levers, ease of operation of knobs or levers
 - b. At water temperature of 120 degrees F, it would take several minutes for a burn to occur; same burn will occur in seconds in 150 degree water
- E. Children’s skin is thinner than adult skin and therefore burns somewhat faster at a given temperature
- F. Contact burns: burns with a hot solid object – have some degree of shape
 - a. Abusive contact burns can have a ‘branding’ pattern – clear patterns, multiple grouped lesions, body parts normally covered by clothing

- b. Accidental contact burns in mobile children often have some streaking/smearing of edges due to movement
 - c. Common objects cause inflicted contact burns: lighters, irons, hair tools, kitchen tools
 - d. Accidental foot burns outside in summer and on heating elements in winter – can be bilateral
- G. MYTH BUSTED: Most round marks on the skin are not cigarette burns.
- a. → Many dermatologic conditions can cause round skin lesions, and appearance alone often cannot make the diagnosis of a cigarette burn in the absence of disclosure
- H. Delays in seeking care are particularly concerning for burns, which are extremely painful injuries that can cause infection and/or disfigurement if not properly treated

Fractures:

- A. There are no fractures that can ‘only’ be caused by abuse or by accident; almost any fracture could be caused by either, and the distinction usually must be made by the history and full evaluation.
- B. Having multiple fractures is common in abused children and rare in children with accidental trauma, unless the trauma is something like a car accident or the bones are closely associated/tend to fracture together (radius/ulna, tibia/fibula)
- C. There are some types of fractures that are common after childhood falls, household accidents, and sports injuries, IF a plausible history is provided in a MOBILE child.
 - a. These include ‘buckle’ fractures, ‘greenstick’ fractures, ‘toddler fractures’, Salter Harris fractures (fractures near joints of arms and legs), long bone shaft fractures (transverse, oblique, spiral), clavicle fractures
- D. MYTH BUSTED: Spiral fractures are not diagnostic of/specific for inflicted injury, and are the most common shape of accidental femur fractures in toddlers.
 - a. Abusive fractures in infants may be spiral if the force is applied with a torsion/twisting motion, but not all abusive extremity fractures are spiral, and not all spiral fractures are abusive
- E. Some fracture types are more unusual in children and when accidental, are predominantly seen after higher-force mechanisms (ie car accidents) and are at minimum concerning for abuse in the absence of a history of such a mechanism
 - a. Fractures of spine, ribs, pelvis, scapula (shoulder blade)
 - b. Classic metaphyseal fractures (‘corner’ fractures, ‘bucket handle’ fractures) are a fracture type almost exclusive to infants and rarely seen due to causes other than abuse
- F. Bruising is rarely present in the vicinity of fractures, both accidental and abusive. The absence of bruising with fractures does not in any way diminish the likelihood that the fractures are abusive.
- G. A skeletal survey or ‘bone survey’ (DIFFERENT than a ‘bone scan’) is a series of xrays looking for fractures not otherwise suspected by history and exam, and is most useful in children under 2 years of age. May be selectively performed in kids 2-5yo depending on the circumstances. Once children reach school age, skeletal surveys are rarely useful and

only performed under special circumstances (ie children with disabilities or other medical conditions that may increase fracture risk).

- a. Part of the importance of skeletal surveys is that some fracture types in infants, such as rib fractures and corner fractures, are often hard to detect by physical exam. Infants can't express the location of pain and discomfort easily. SO, this also means that a caregiver who was not present when these types of fractures were caused, may plausibly not know there are there.
- b. We often schedule patients with a diagnosis of or concern for physical abuse for a second skeletal survey (follow up skeletal survey, FUSS) two weeks after the first one. This second test is important because some fractures aren't easy to see on xrays until they start to heal, and we may find additional fractures on the FUSS. We also want to verify that any known fractures are healing appropriately.

Neglect:

- A. Evaluation of a patient for physical abuse often also reveals some evidence of neglect, in many forms ranging from inadequate supervision to inadequate food to inadequate medical care
- B. MYTH BUSTED: Among fatal cases of child maltreatment, neglect is even more prevalent than physical abuse.
 - a. Malnutrition, inadequate supervision, inadequate medical care, inappropriate caretakers
- C. Caregiver substance abuse is a risk factor for maltreatment and a red flag to look for possible maltreatment, rather than a form of maltreatment in and of itself
 - a. High rates of interpersonal violence
 - b. Problems with attachment – emotional neglect
 - c. Physical and environmental neglect – diversion of family's limited resources to addiction
 - d. High rates of comorbid psychological disorders (self-medication)
 - e. Elevated risk of infant death when sharing sleep surface w/ intoxicated adult
- D. Failure to thrive → 'undernutrition' – often found with other forms of abuse/neglect
 - a. Not growing as expected relative to age and gender norms, leading to risk of medical complications
 - b. May be caused by medical conditions, neglect, combination thereof
 - c. Parent risk factors: substance abuse, intellectual disability, mental health issues
 - d. Child risk factors: prematurity, neurological problems
 - e. #1 risk factor? POVERTY
 - f. Developmental problems going forward – brain stops growing by 2yo
 - g. Need growth chart interpreted by medical provider for diagnosis
 - h. Can be fatal - starvation
- E. MYTH BUSTED: The most dangerous drug for fetal exposure? Alcohol
- F. Neglect can have some of the most profound long-term consequences of all maltreatment