Foundations of Emergency Medicine
Foundations III: Guided Small Group Experience

Session 27: Child Abuse and Neglect
Unit: Clinical Skills

- **Agenda and Learning Objectives**
  - Case Part I – Non-accidental Trauma (NAT) – History and Exam (25 minutes)
    - Define non-accidental trauma and other forms of child maltreatment
    - Name key history and physical examination features which suggest NAT
    - Become familiar with key pediatric milestones to augment this evaluation
    - Know basic bruising patterns that could suggest NAT
    - Practice getting a history when concerned for NAT
  - Case Part II – NAT – Medical Decision Making, Imaging, and Resource Utilization (20 minutes)
    - Describe common mimickers of child abuse
    - Know injuries that are highly correlated with child maltreatment
    - Learn which laboratory and radiographic tests may be helpful in the evaluation of NAT
    - Define mandated reporters and identify others who need to be involved
  - Case Concludes (10 min)
    - Review Session Teaching Points

- **Note to Facilitators**

  This is a session covering child abuse and other forms of child maltreatment. Prior to this session, please familiarize yourself with your hospital's policies and procedures regarding child abuse and neglect. Also review your state's definitions of child abuse and maltreatment.

- **Case Part I – NAT – History and Exam (25 minutes)**

  Brian is a 3-month-old male, born via a full-term, normal, spontaneous vaginal delivery. No subsequent medical problems. He presents to the emergency department with fussiness after a fall. He is accompanied by his mother, who is visibly distressed. He was in his usual state of health earlier today, when she thinks he rolled off the changing table onto the floor. She had her back turned and reports not witnessing the fall. The changing table is on the floor of her bedroom, estimated height 3 feet. She states that he has not had fever or infectious symptoms. He has been eating less than normal since the injury. The infant is tachycardic, crying, and intermittently consolable by his mother. On physical examination, he is noted to have a temporal hematoma.

- **Discussion Questions with Teaching Points**
  - **What are some forms of child abuse and maltreatment[1]?**

- Of note, several of these definitions vary slightly by state. Be familiar with your state's specific laws.
- Some states have specific definitions in statute for parental substance abuse and/or abdandonment as forms of child abuse
- **Physical abuse**
    - Physical abuse is generally defined as "any nonaccidental physical injury to the child" and can include striking, kicking, burning, or biting the child, or any action that results in a physical impairment of the child.
        - In approximately 38 States and American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands, the definition of abuse also includes acts or circumstances that threaten the child with harm or create a substantial risk of harm to the child's health or welfare. In seven States, the crime of human trafficking, including labor trafficking, involuntary servitude, or trafficking of minors, is included in the definition of child abuse.
- **Sexual abuse**
    - All States include sexual abuse in their definitions of child abuse. Some States refer in general terms to sexual abuse, while others specify various acts as sexual abuse. Sexual exploitation is an element of the definition of sexual abuse in most jurisdictions. Sexual exploitation includes allowing the child to engage in prostitution or in the production of child pornography.
        - In 21 States, the definition of sexual abuse includes human trafficking, including sex trafficking or trafficking of children for sexual purposes.
- **Psychological maltreatment**
    - Typical language used in these definitions is "injury to the psychological capacity or emotional stability of the child as evidenced by an observable or substantial change in behavior, emotional response, or cognition" and injury as evidenced by "anxiety, depression, withdrawal, or aggressive behavior."
        - Almost all States, the District of Columbia, American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands include emotional maltreatment as part of their definitions of abuse or neglect. Approximately 33 States, the District of Columbia, Guam, the Northern Mariana Islands, and Puerto Rico provide specific definitions of emotional abuse or mental injury to a child.
- **Neglect**
    - Neglect is frequently defined as the failure of a parent or other person with responsibility for the child to provide needed food, clothing, shelter, medical care, or supervision to the degree that the child's health, safety, and well-being are threatened with harm.
        - Approximately 25 States, the District of Columbia, American Samoa, Puerto Rico, and the Virgin Islands include failure to educate the child as required by law in their definition of neglect. Ten States and American Samoa specifically define medical neglect as failing to provide any special medical treatment or mental health care needed by the child. In addition, four States define medical neglect as the withholding of medical treatment or nutrition from disabled infants with life-threatening conditions.

- **Parental Substance Abuse**
  - Parental substance abuse is an element of the definition of child abuse or neglect in some States. Circumstances that are considered abuse or neglect in some States include:
    - Prenatal exposure of a child to harm due to the mother's use of an illegal drug or other substance (14 States and the District of Columbia)
    - Manufacture of a controlled substance in the presence of a child or on the premises occupied by a child (12 States)
    - Allowing a child to be present where the chemicals or equipment for the manufacture of controlled substances are used or stored (three States)
    - Selling, distributing, or giving drugs or alcohol to a child (seven States and Guam)
    - Use of a controlled substance by a caregiver that impairs the caregiver's ability to adequately care for the child (eight States)
- **Abandonment**
  - In general, it is considered abandonment of the child when the parent's identity or whereabouts are unknown, the child has been left by the parent in circumstances in which the child suffers serious harm, or the parent has failed to maintain contact with the child or to provide reasonable support for a specified period of time.
    - Approximately 17 States and the District of Columbia include abandonment in their definitions of abuse or neglect, generally as a type of neglect.
    - Approximately 19 States, Guam, Puerto Rico, and the Virgin Islands provide definitions for abandonment that are separate from the definition of neglect.

- **When should non-accidental trauma or child abuse/maltreatment be in the differential diagnosis?**
  - Always
    - Remember the following:
      - Young pediatric patients and infants are a vulnerable group and at highest risk of mortality and morbidity from physical abuse overall.
      - Boys experience slightly higher rates of physical abuse than girls, and physical abuse is more likely to occur in adolescents.

- **What are some risk factors for child abuse?**
  - Maternal smoking
  - Multiple siblings
  - Low infant birth weight
  - Young maternal age
  - Lack of a support system/single parenting
  - Households with multiple unrelated adults
  - Parental substance abuse
  - Parental history of abuse and/or prior history of CPS involvement
  - Poverty

- **How should the interview be conducted? Are there special considerations?**
  - Obtaining key elements of the history are critical to understanding the mechanism of injury. Asking open-ended questions and allowing the parent or caregiver to speak without interruption is the goal. Avoid leading questions. Conduct the interview in a non-accusatory manner.

- **What additional history should be taken?**
  - Who else lives in the home?
  - Does anyone else care for the child?

- **What are general red flags you may note in a history that would raise your concern for NAT?**
  - Vague history or no explanation for injury
  - Shifting or changing significant details of the history
  - Delay in seeking care or medical attention
  - In those who can't talk (infants, young toddlers), non-specific symptoms such as irritability and fussiness
  - History changing depending on the person interviewed.

- **Does the history in this case have any inconsistencies?**
  - The explanation that the child rolled off the changing table is a potential red flag.
    - While most pediatric injuries are minor and accidental, an understanding of a child's developmental capabilities can help the physician understand if the injury is compatible with the mechanism. Pediatric milestones change dynamically throughout childhood. Be familiar with them and know where to reference them, as needed. See the milestone table below.

Pediatric Milestones

Age	Stage
2-3 months	• Able to hold up body with arms when lying on stomach • Kick legs • Bring hands to mouth • Watch moving objects and faces closely • Roll from front to back
6-7 months	• Roll over stomach to bac k and back to stomach • Sit up • Reach for objects • Move objects from one hand to another • Support weight on legs when held up
12 months	• Crawl • Pull self to stand • Walk holding onto furniture or "cruise" • May walk a few steps without help • Grasp with fingers
2 years or 24 months	• Walk alone • Jump • Pull toys while walking • Begin to run • Kick a ball • Climb on/off furniture

Source: Early Stages. District of Columbia Public Schools

http://aapdc.org/wp-content/uploads/2014/01/Early-Stages-Milestones-EN-2011.pdf

- Brian should be able to (3 month milestones):
  - Hold his head up, steady and unsupported
  - Push down on his legs when his feet are on a hard surface
  - Possibly roll over from his tummy to his back
  - Bring his hands to his mouth
  - When laying prone, push up on his hands and elbows
- Brian rolling off the table on his own could be early for him developmentally. This does not mean he was abused, but the fact that it happened should heighten suspicion of NAT and lead to more thoughtful exploration.

On to the physical exam. Remember to err on the side of completely undressing the patient, especially in the non-verbal.

- **What clues should raise concerns for non-accidental trauma?**
  - An injury that is inconsistent with the patient's capabilities. For example, a 9 month old with a femur fracture sustained from "running around."
  - Any pattern, timing and/or severity of injury that do not correlate with the history and exam.

- **When does the presence of bruising matter?**
  - Bruising can be easily dismissed and is one of the most common physical exam findings in children.
    - It is uncommon in children under 6 months of age and those who are non-ambulatory.
    - Active toddlers and mobile children often sustain injuries and have bruises in typical locations (anterior shins, forearms). A non-mobile infant who presents with bruising warrants further consideration.
    - "**Those who don't cruise, rarely bruise**.[3]"
      - In a study by Sugar, et al. of 973 children, 21% had bruising of no known medical cause. Only 0.6% (2 of 366 children) were younger than 6 months and 1.7% were younger than 9 months.
    - Bruises on the face and trunk are rare.
    - It is not possible to "date" a bruise.[4]
    - Remember the **TEN-4 bruising rule**[5]
      - Be aware of bruising that occurs on the
        - Torso
        - Ears
        - Neck
        - Any bruising on an infant 4 months or younger

- **Interview Practice**
  - Age-appropriate interview techniques should be utilized.

- For example, direct observation of infant-parent interaction may be informative. Children may openly volunteer information, if asked open-ended questions. Adolescents may typically prefer or need direct questioning.
  - Examples of open-ended questions include,
    - "Who lives at home with you?"
    - "What is your home like?"
    - Try not to ask, "Did daddy touch you?"
  - Caution here: unless you are a trained forensic interviewer, especially with younger children, try to stay focused on what they're feeling ("Does your tummy hurt?") rather than etiology ("Who gave you this bruise?"). This preserves the future forensic interview if needed (children (and adults) tend to unconsciously confabulate when asked the same question repeatedly and the testimony loses its accuracy over time).
  - Document any volunteered information that is useful.
- Watch the sample videos below:
  - What Not To Do
    - https://drive.google.com/file/d/1bUoFbzLrxXkRC5VKao8DFQrjMKr9aJZ9/view?usp=drive_web
  - What To Do
    - https://drive.google.com/file/d/17x6IEQgBazl-P1gJ3dQYL1-prndtx30Q/view?usp=drive_web

- **Now practice!**
  - Have everyone pair off. One person will be the physician, and the other the mother of the patient in this case. As the physician, focus on asking open-ended questions like what was modeled in the video. As the patient's mother, think about feedback to give the interviewer while role-playing, and wait until the end to provide it. Then switch roles and repeat.

❖ **Case Part II – NAT – Medical Decision Making, Imaging, and Resource Utilization (20 minutes)**

After undressing Brian, it is noted that he has a hyper-pigmented macule versus ecchymotic lesion on his back. When his mother is questioned about this, she is unable to provide an explanation for it.

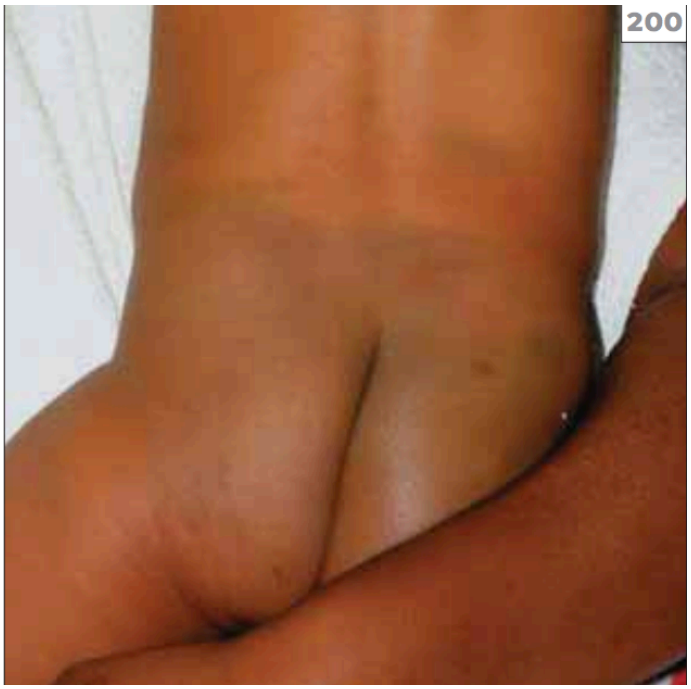
❖ **Discussion Questions with Teaching Points**

- **What is commonly mistaken for bruising on an infant? What should be documented?**
  - Thorough documentation of all physical examination findings is encouraged and may be used in court.
  - There are many mimickers of child physical abuse. Historically, osteogenesis imperfecta (OI)[5] was commonly confused for abusive injury. OI is a genetic disorder involving collagen formation and can present with multiple fractures in different stages of healing. Other associated findings include:
    - Blue sclera
    - Easy bruising

- Thin Skin

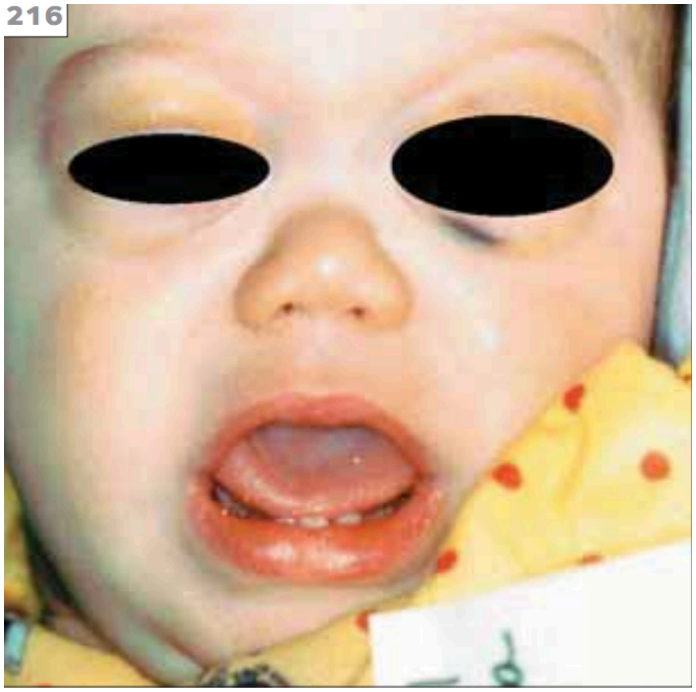
- Congenital dermal melanocytosis is a benign, often irregularly shaped macule with characteristic locations is oftentimes mistakenly confused for bruising or an ecchymotic lesion. Parents are typically able to confirm the presence of these congenital birthmarks.
- Other cutaneous mimics include neuroblastoma, Heinoch-Schonlein Purpura, and Phytophotodermatitis

Congenital Dermal Melanocytosis



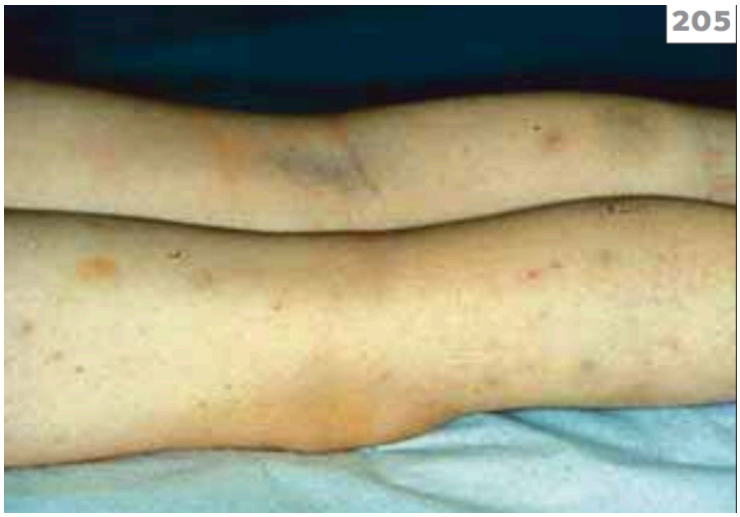
Source: Cutaneous Conditions Mimicking Child Abuse
http://www.thieme.com/media/samples/pubid483957939.pdf

Neuroblastoma



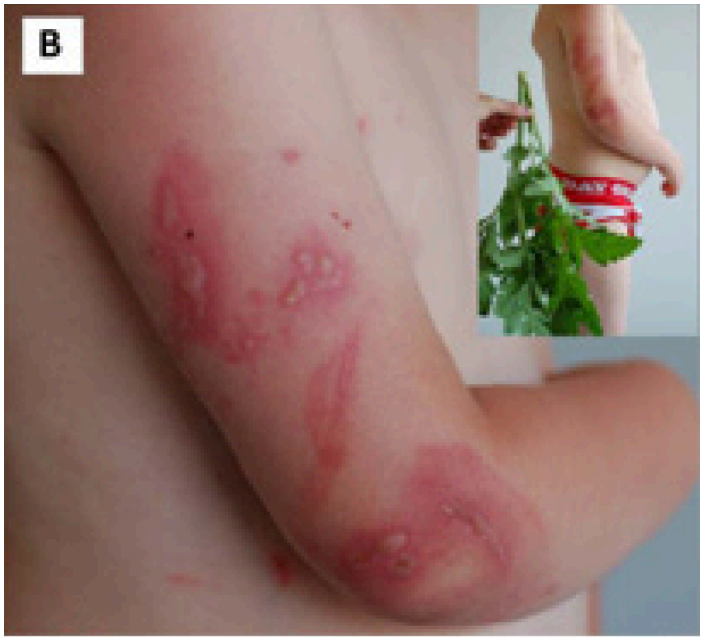
Source: Cutaneous Conditions Mimicking Child Abuse
http://www.thieme.com/media/samples/pubid483957939.pdf

Heinoch-Schonlein Purpura



Source: Cutaneous Conditions Mimicking Child Abuse
http://www.thieme.com/media/samples/pubid483957939.pdf

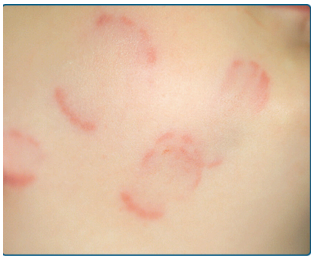
Phytophotodermatitis[7]



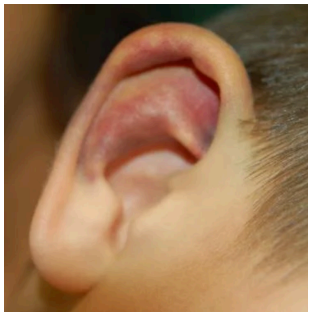
- Documentation of physical examination findings should be descriptive and include location, measurement/size and color. Photographs can be helpful. Many electronic medical records have mechanisms to enter photos now.
- Documentation should be unbiased and reflect any information gathered as well as diagnostic impressions. In this case, the lesion on Brian's back is consistent with bruising, in a relatively non-mobile infant.

- **Are there any injuries that are pathognomonic for NAT?**
  - While there are injuries suggestive of NAT, no finding is pathognomonic for NAT. Strong consideration should be given in certain situations, especially with an incompatible history:
    - Multiple injuries, especially fractures, in various stages of healing
    - Patterned injuries such as stocking-glove burns, loop and bite marks to nonbony areas, dental/oral injuries (such as tears of the frenulum), and auricular/pinna bruises.
  - Certain skeletal injuries can be more suggestive for NAT and include posterior rib fractures, unusual fractures of the scapula, classic metaphyseal lesions (CMLs, "bucket handle fractures") and sternal fractures.

Bite marks[8]



Auricular Hematoma[9]



- **What should be done? Who should be notified?**
  - Medical stabilization and treatment are a priority.
  - Depending on the extent of injury, screening laboratory tests may include:
    - A complete blood count with differential (and smear if concerned for oncologic processes)
    - Electrolyte panel including liver and pancreatic function testing (for abdominal trauma)
    - Urinalysis with microscopy (for protein and blood)
    - Additional specialty labs may be useful in consultation with subspecialty services (genetics, orthopedics, oncology, etc.).
  - Advanced imaging including CT or MRI may be helpful adjuncts.
  - Skeletal surveys assist in the detection of unsuspected fractures and should be performed using the American College of Radiology's standards of imaging[10].

Skeletal Survey Basics

Indications	• Pediatric patients <2 yo with abusive injuries
	• Pediatric patients with suspicious injuries including,
	  • TEN-4 bruising pattern
	  • Injuries inconsistent with history
	• Infants with sudden, unexplained death
	• Unexplained intracranial/hypoxic injuries
	• Siblings of abused infants

Radiographic Images	• Skull (2) • Cervical spine (1) • Thorax (4) • Lumbosacral spine (1) • Pelvis (1) • Humeri (2) • Forearms (2) • Hands (2) • Femurs (2) • Lower legs (2) • Feet (2)

  - With a reasonable suspicion for abuse, a report to Child Protective Services must be made. If available, consultation with a social worker and a child abuse pediatrician is encouraged.
  - Inpatient hospitalization may be warranted in the child who requires additional evaluation, observation or protection.
  - Consultation with the some of the following subspecialties may be indicated:

- Neurosurgery depending on neuroimaging results (bleeds, fractures, traumatic axonal injury from shaking.)
- Ophthalmology for performance of a dilated funduscopic examination and evaluation for the presence of retinal hemorrhages, such as occurs in Shaken Baby Syndrome
- Hematology and oncology with suspicion for coagulopathies and/or a bleeding diathesis.
- An orthopedics consult may be necessary to help reduce/repair fractures.

- **Whose duty is it to report?**
  - With reasonable suspicion for abuse, a report to Child Protective Services should be made, and is actually legally required. Failure to do so may result in civil or criminal penalties against the person who refuses to report[11]. The specific provider who makes the report (physician, nurse, social worker) may vary by institution, but any provider can file a report at any time, even if the care team disagrees on the level of concern.

❖ **Case Concludes (10 min)**

Upon discovery of additional bruising to Brian's back and inadequate explanation for the injury, a CPS report is filed and the social worker was consulted. A CT head was performed which was negative, additional basic labs (CBC, CMP, Lipase and a coagulion profile) were obtained and Brian was admitted to pediatrics with a consultation to ophthamology. His primary care pediatirician was notified of the evaluation.

❖ **Case Teaching Points Summary**

- **Recognize when to be concerned about child maltreatment/non-accidental trauma (NAT)**
  - Healthcare providers should maintain a high index of suspicion for child abuse and maltreatment, especially in the evaluation of physical injuries presenting to the ED
  - The history and physical examination should be compatible with each other
  - In young infants and toddlers, there should be consideration given to age-appropriate developmental milestones in relation to the history and exam.
  - "Those who don't cruise, rarely bruise"

- **Management of NAT in the emergency department**
  - There is no injury pathognomonic for NAT
  - Be aware of common abuse mimics
  - A CPS report must be made if there is *reasonable suspicion* that child abuse is occurring

❖ **Facilitator Background Information**

In 2016, there were over 650,000 cases of child abuse and neglect reported to Child Protective Services (CPS), which is likely an underestimate of the prevalence of actual cases in the United States. Child maltreatment coupled with toxic stress can lead to significant morbidity and mortality with a significant lifetime financial burden on our healthcare systems. Toxic stress occurs when a child experiences strong, frequent, and/or prolonged adversity without adult support. This includes NAT, as well as other health and economic burdens. It is known that

victims of abuse have increased emergency department (ED) ulilization, but many of these cases still go unrecognized. Identification of child abuse is difficult, which may be in part due to its wide range of presentations. Abuses to the child may be delivered erratically and repetitively, which may cloud the clinical picture in identifying ongoing abuse. There may also be social, racial, and/or other cultural concerns to account for this underreporting. Because of increased utilization of the ED, the healthcare provider has an important responsibility to detect child abuse and intervene. The ED has a responsibility to identify these children early on in their presentations, with a heightened awareness for potential sentinel events which may present themselves as benign chief complaints (ie abdominal pain).

While physical injuries resulting from child abuse often present to the ED, it is known that the effects of abuse can also lead to cognitive and emotional developmental delays. There is increasing research demonstrating remodeling on a cellular level which may alter the brain and neuroendocrine stress response later in life.[14]

In broader terms, abuse is most commonly recognized as:

a) Physical Abuse
b) Sexual Abuse
c) Psychological Maltreatment
d) Neglect
e) Parenteral Substance Abuse
f) Abandonment

The Child Abuse and Prevention Treatment Act (CAPTA) was enacted in 1974 in order to generate a federal response to child abuse and maltreatment. Reporting laws vary from state to state, however federal law mandates reporting from designated professionals and includes health care providers, caregivers, medical examiners, teachers, and social workers. Contrary to popular belief that reporting should only occur if abuse is confirmed, it is important to know that *reasonable suspicion* of child abuse is enough and must lead to filing a CPS report.

Understanding the importance of recognition and early intervention is imperative as this will limit the long-term sequelae of abuse.

- **References**
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  - **Editor:** Dr. George Leach
  - **Expert Editor:** Dr. Dina Wallin
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Additional Websites:

- https://www.everycrsreport.com/reports/R40899.html#_Toc245618881
- https://www.cdc.gov/violenceprevention/childabuseandneglect/index.html
- https://www.childwelfare.gov/topics/can/identifying/