KY: Shaken Baby Syndrome

Author: Fran Laughton, RN, PHN, MSN, FNP; Lauren Robertson, BA, MPT

Contact hours: 2.5

Course price: $25

Instructions

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ATrain Education is accredited as a provider of continuing nursing education through the Kentucky Board of Registered Nursing. This course meets the requirement for coursework and training in pediatric abusive head trauma/Shaken Baby Syndrome.

Course Summary

This course defines shaken baby syndrome (SBS) and abusive head injury (AHT); reports on Kentucky law regarding child abuse, neglect, and physical injury; presents triggers and risk factors for SBS; summarizes the clinical presentation and diagnosis of SBS; and discusses intervention strategies and education campaigns to prevent abuse.

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Criteria for Successful Completions
80% or higher on the post test, a completed evaluation form, and payment where required. No partial credit will be awarded.

Course Objectives

When you finish this course you will be able to:

1. Define pediatric abusive head injury and shaken baby syndrome.
2. Comment on the evolution of society's recognition of child abuse and explain the Child Abuse Prevention and Treatment Act (CAPTA).
3. Explain the definitions of abuse, neglect, and physical injury in Kentucky law.
4. Relate the child maltreatment reporting requirements under Kentucky law.
5. Outline the incidence of abusive head trauma in the U.S. and in Kentucky.
6. Describe the most common triggers and risk factors for shaking a baby and summarize factors that protect against pediatric abusive head trauma.
7. Summarize the clinical presentation and diagnosis of shaken baby syndrome.
8. Discuss intervention strategies and educational campaigns intended to prevent SBS. Compare and contrast the primary schools of thought concerning the degree and type of force needed to cause the injuries seen in SBS.

Pediatric Abusive Head Trauma

We will begin and end this course with a simple message:

Never, ever shake a baby!

Shaken baby syndrome (SBS) is a type of abusive head trauma (AHT) inflicted upon children. It results from violently shaking an infant by the shoulders, arms, or legs. Head trauma can occur either from shaking alone or from impact with or without shaking. Damage can occur from as little as 5 seconds of shaking. It is a non-accidental, inflicted, preventable form of child maltreatment.

> We will be talking about abusive head trauma, which the general public usually knows as *shaken baby syndrome*. By either name, we're describing injuries resulting from a kind of child abuse. Shaken baby syndrome may result when someone shakes an infant out of frustration, perhaps to get him or her to stop crying, or when the infant is thrown, struck, or slammed against a hard surface. Of course, this does not include gentle bouncing or other playful activity that is actually important to healthy child development. Even though the caregiver often does not intend to harm the baby, shaken baby syndrome is a serious form of abuse.
>
> Alan Guttmacher, MD
> National Institute of Child Health
> and Human Development, 2013

Recommended Terminology

Although the term *shaken baby syndrome* is still in wide use, the American Academy of Pediatrics recommends that healthcare providers use the term *abusive head trauma* in their diagnosis and medical communications when referring to head injuries in infants and young children. This is because the term *shaken baby syndrome* implies a single injury mechanism (Parks et al., 2012).

The Centers for Disease Control and Prevention (CDC) have launched an effort to develop uniform case definitions of child maltreatment and abusive head trauma. CDC defines **pediatric abusive head trauma** as

> . . . an injury to the skull or intracranial contents of an infant or young child less than 5 years of age due to inflicted blunt impact and/or violent shaking. This case definition specifically excludes unintentional injuries resulting from neglectful supervision and gunshot wounds, stab wounds, and penetrating trauma.

There are many other terms used in the medical, legal, and law enforcement communities to describe traumatic brain injuries in infants, among them shaken infant syndrome, shaking impact syndrome, non-accidental injury, non-accidental trauma, non-accidental head injury, and shaken baby syndrome/abusive head trauma (SBS/AHT) (Parks et al., 2012). This course will use a variety of terms throughout.

Exactly how many instances of shaken baby syndrome occur each year is difficult to determine because of differing definitions, cases not reported, and contradictory reporting and coding procedures. We do know that, in the United States, abuse is the third leading cause of all head injuries in children after falls and motor vehicle crashes. In the first year of life, when infants are particularly vulnerable, the majority of serious head injuries are caused by physical abuse (Parks et al., 2012).

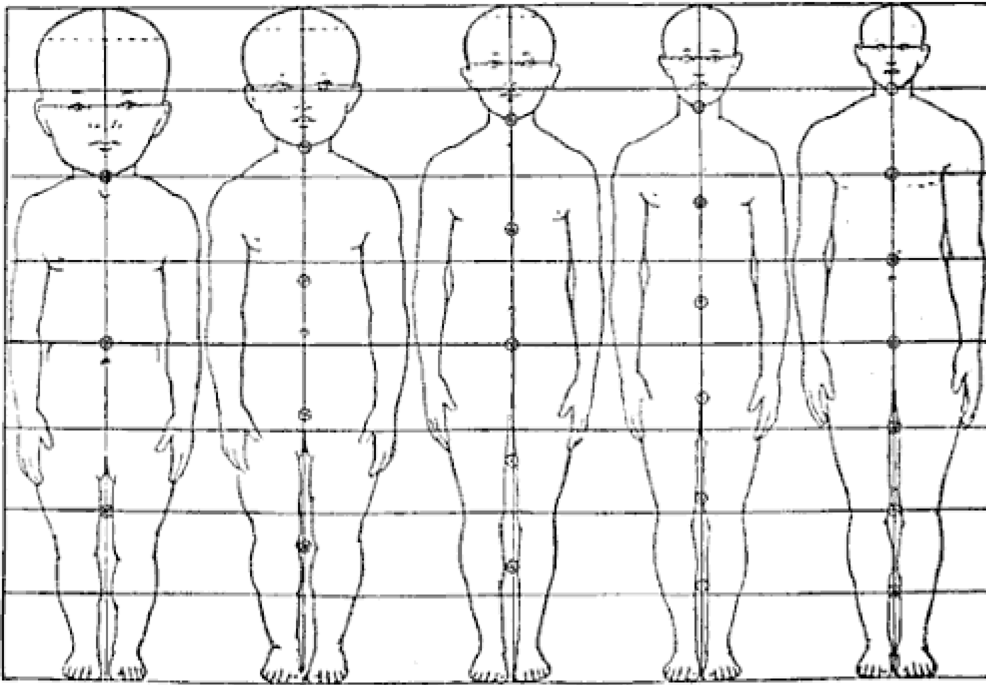
Many young children and infants who are shaken never fully recover. Nearly two-thirds of child victims of abusive head trauma suffer serious health consequences, significant disability, and other long-term consequences (Parks et al., 2012). While we have learned a lot about why child abuse happens, attempts to prevent it are relatively new.

Mechanism of Injury

> It is really tragic when we see children who are victims of abusive head trauma or shaken baby syndrome come in to our pediatric intensive care units and hospitals around the country because we look at infants who, for the most part, have been healthy babies, who have their whole life ahead of them, and because of social circumstances and frustrations by the adults caring for them, often end up with permanent brain injuries that affect the remainder of their lives.
>
> Cindy Christian, MD
> NICHD, 2013

Infants 2 to 4 months of age are at the greatest risk of injury from shaking, because their brains are softer and their skulls are thinner than those of adults. An infant's head is also larger in proportion to its body than an adult's head and its neck muscles, tendons, and ligaments are weaker than those of an adult.

Comparative Head Sizes over the Lifespan


Human body proportion changes with age. An infant (on the left) has a larger head than older children and adults in proportion to its body. Courtesy of Wikimedia Commons.

Because of its large head and weak neck muscles, a shaken infant or toddler can sustain a type of whiplash similar to that from an automobile accident. Shaking may bruise the infant's brain or even tear the large blood vessels along the outer layer of the brain, causing it to bleed, swell, and press against the inside of the skull. If the pressure is not relieved, additional injury may ensue. Babies who are shaken violently can die from this kind of incident (NICHD, 2013).

A blow to an infant's head may result in fracture to the skull as well as brain bleeding and swelling. Like severe shaking, such impact to the head often leads to permanent brain damage or death (NICHD, 2013).

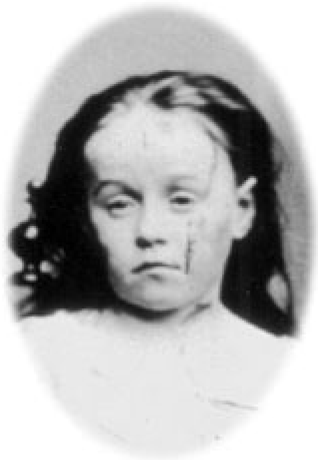
Societal Recognition of Child Abuse

Child abuse and neglect is not a new phenomenon—it has been documented for more than two thousand years. For most of human history children had no rights in the eyes of the law and it was unthinkable that the law would intervene in the domain of the family.

In the United States, the first known legal response to child abuse occurred in 1874. In a case that was to have significant repercussions, Henry Bergh, founder of the New York Society for the Prevention of Cruelty to Animals (SPCA) and acting as a private citizen, pleaded in court to have an 8-year-old child named Mary Ellen Wilson removed from her abusive and neglectful environment. Although there were laws in New York that allowed the state to remove neglected children from their homes, New York City authorities were reluctant to take up Mary Ellen's cause (Watkins, 1990).

Etta Wheeler, a Methodist mission worker persuaded Mr. Bergh to intervene at the behest of her niece who encouraged her to contact Mr. Bergh, saying “You are so troubled over that abused child, why not go to Mr. Bergh? She is a little animal surely" (Watkins, 1990). During a hearing, Mr. Bergh was careful to say that he was not acting as a representative of the New York SPCA and emphasized that he was “determined within the framework of the law to prevent the frequent cruelties practiced on children” (Watkins, 1990).

Mary Ellen was removed from her abusive situation and placed in an institutional shelter for adolescent girls. Uncomfortable with this placement, Ms. Wheeler once again intervened and received permission to send Mary Ellen to live with her own mother in upstate New York. When Ms. Wheeler's mother died, Mary Ellen went to live with Ms. Wheeler's sister and her husband. Mary Ellen eventually married and had two daughters. She died in 1956 at the age of 92 (Watkins, 1990).



Mary Ellen Wilson in 1874

On April 10, 1874, Mary Ellen testified:

“My father and mother are both dead. I don’t know how old I am. I have no recollection of a time when I did not live with the Connollys. . . Mamma has been in the habit of whipping and beating me almost every day. She used to whip me with a twisted whip—a raw hide. The whip always left a black and blue mark on my body. I have now the black and blue marks on my head which were made by Mamma, and also a cut on the left side of my forehead which was made by a pair of scissors. She struck me with the scissors and cut me.

“I have no recollection of ever having been kissed by any one—have never been kissed by Mamma. I have never been taken on my mamma’s lap and caressed or petted. I never dared to speak to anybody, because if I did I would get whipped. . . I do not know for what I was whipped—Mamma never said anything to me when she whipped me. I do not want to go back to live with Mamma, because she beats me so.”

Source: Watkins (1990). Courtesy of the American Humane Society.

Diagnostic Criteria for Battered Child Syndrome

Auguste Ambroise Tardieu (1818–1879). Photo courtesy of Wikimedia Commons.

Mary Ellen's case led to the formation of societies in many states to protect children from cruelty. In 1860 Ambroise Tardieu, a French forensic physician—in a treatise entitled *Forensic Study on Cruelty and the Ill-Treatment of Children,* was the first medical professional to provide a clinical definition of **battered child syndrome**. Tardieu detailed 32 cases of battered child syndrome in detail, including 18 that ended in the death of the child. Unfortunately, his clear and precise clinical descriptions were largely ignored by physicians and forensic specialists until nearly a century after his death.

In the 1950s and early 1960s, a movement to protect children came as the result of several pediatricians' publishing articles about children suffering multiple fractures and brain injuries at the hands of their caretakers. In 1961 C. Henry Kempe, a physician and president of the American Academy of Pediatrics, convened a conference on the battered child syndrome, in which he argued that doctors had a "duty" to the child to prevent "repetition of trauma." The Battered Child Syndrome Conference resulted in many states' passing laws to protect children from physical abuse.

In 1985 Kempe introduced a set of diagnostic criteria for suspected child abuse:

> Abuse should be considered in any child exhibiting evidence of fracture of any bone, subdural hematoma, failure to thrive, soft tissue swellings or skin bruising, in any child who dies suddenly, or where the degree and type of injury is at variance with the history given regarding the occurrence of trauma. (Kempe et al., 1985)

Child abuse is now recognized as a problem of epidemic proportions, with serious consequences that may cause indelible pain throughout the victim's lifetime. Unfortunately, violent and negligent parents and caretakers serve as a model for children as they grow up. The child victims of today, without protection and treatment, may become the child abusers of tomorrow.

Child abuse is a problem for the entire community. Protecting children from abuse requires the coordination of many resources. Parents, caregivers, and professional groups and agencies involved with families must work together and assume responsibility for preventing child abuse.

Child Abuse Prevention and Treatment Act (CAPTA)

The Child Abuse Prevention and Treatment Act (CAPTA) was originally enacted by Congress in 1974 (PL 93-247) and reauthorized in 2010 (PL 111-320). CAPTA provides minimum standards for defining physical child abuse, child neglect, and sexual abuse that states must incorporate into their statutory definitions in order to receive federal funds. Under CAPTA, child abuse and neglect means:

- Any recent act or failure to act on the part of a parent or caretaker that results in death, serious physical or emotional harm, sexual abuse, or exploitation
- An act or failure to act that presents an imminent risk of serious harm (Child Welfare Information Gateway, 2013)

The definition of child abuse and neglect refers specifically to parents and other caregivers. A "child" under this definition generally means a person who is under the age of 18 or who is not an emancipated minor (CWIG, 2013).

In cases of child sexual abuse, a "child" is one who has not attained the age of 18 or the age specified by the child protection law of the state in which the child resides, whichever is younger (CWIG, 2013).

While CAPTA provides definitions for sexual abuse and the special cases related to withholding or failing to provide medically indicated treatment, it does not provide specific definitions for other types of maltreatment—physical abuse, neglect, or psychological maltreatment (CWIG, 2013).

The Kentucky Department for Community Based Services (DCBS) oversees the CAPTA state plan and administers the state's statutes and regulations relating to child welfare.

Kentucky Law on Child Abuse

The State of Kentucky requires Kentucky childcare professionals, and others who have contact with infants and toddlers, to complete training on the recognition and prevention of pediatric traumatic head injuries and shaken baby syndrome (KY House Bill 285). Those who must complete this training include:

- Law enforcement students
- Kentucky schools
- Child protection staff
- Inmates
- Foster parents
- Childcare center employees and owners

- Family childcare providers
- The HANDS program
- Urgent care facilities employees
- First responders, EMTs, and paramedics
- Social workers, physician assistants, and nurses

Abuse or Neglect in Kentucky Law

[From Kentucky Rev. Stat. §600.020]

In Kentucky law, "abused or neglected child" means a child whose health or welfare is harmed—or threatened with harm—when his or her parent, guardian, or other person exercising custodial control or supervision:

- Inflicts or allows to be inflicted upon the child physical or emotional injury by other than accidental means.
- Creates or allows to be created a risk of physical or emotional injury to the child by other than accidental means.
- Engages in a pattern of conduct that renders the parent incapable of caring for the immediate and ongoing needs of the child, including, but not limited to, parental incapacity due to alcohol and other drug abuse.
- Continuously or repeatedly fails or refuses to provide essential parental care and protection for the child, considering the age of the child.
- Does not provide the child with adequate care, supervision, food, clothing, shelter, education, or medical care necessary for the child's well-being.
- Fails to make sufficient progress toward identified goals as set forth in the court-approved case plan to allow for the safe return of the child to the parent that results in the child remaining committed to the Cabinet and remaining in foster care for 15 of the most recent 22 months.

Physical Injury in Kentucky Law

[From Kentucky Rev. Stat. §600.020]

In Kentucky law, "physical injury" means substantial physical pain or any impairment of physical condition.

"Serious physical injury" means physical injury that creates a substantial risk of death, or causes serious and prolonged disfigurement, prolonged impairment of health, or prolonged loss or impairment of the function of any bodily member or organ. Persons responsible for the child include:

- A parent who is the biological or adoptive mother or father of a child
- A person exercising custodial control and supervision or an agency that has assumed the role and responsibility of a parent or guardian for the child but does not necessarily have legal custody of the child

Exception: A parent or other person exercising custodial control or supervision of the child who is legitimately practicing his or her religious beliefs shall not be considered a negligent parent because of failure to provide specified medical treatment for a child for that reason alone. This exception shall not preclude a court from ordering necessary medical services for a child.

Additional Legislation: Kentucky House Bill 290

To further strengthen Kentucky's overall response to pediatric abusive head trauma, on March 20, 2013 Kentucky's governor signed into law House Bill 290, which established an independent review panel to investigate cases of child deaths and near-fatal injuries. The bill places in statute the governor's initiative to ensure that child protection agencies meet the policies and standards expected in cases of child abuse and neglect (Kentucky.gov, 2013).

Reporting Child Maltreatment in Kentucky

> What's interesting about child abuse is that, especially with really young babies and young children, at first, before they have a fatal or near fatal event, there really were warning signs or somebody noticed something or somebody had a concern but they really didn't speak up, or they didn't want to get involved, or they didn't want to cause problems. But when we look back, because looking back often teaches us how to predict or how to do a better job going forward, we often see that there were things that were missed.
>
> Mary Pierce, MD
> NICHD, 2013

Child Abuse Reporting Requirements

[From Kentucky Rev. Stat. §620.030 and §620.050]

Any person who knows or has reasonable cause to believe that a child is dependent, neglected, or abused shall immediately report. All persons are required to report, including, but not limited to:

- Physicians, osteopathic physicians, nurses, coroners, medical examiners, residents, interns, chiropractors, dentists, optometrists, emergency medical technicians, paramedics, or health professionals
- Teachers, school personnel, or child caring personnel
- Social workers or mental health professionals
- Peace officers

Neither the husband-wife nor any professional-client/patient privilege, except the attorney-client and clergy-penitent privilege, shall be a ground for refusing to report. The Reporters are not specifically required by statute to provide their name in the report.

The identity of the reporter shall not be disclosed *except*:

- To law enforcement officials, the agency investigating the report, or to a multidisciplinary team
- Under court order, after a court has found reason to believe the reporter knowingly made a false report

Making a Report

Reports of child maltreatment, including pediatric abusive head trauma, can be made by calling the Child Protection Hotline toll-free at 1-877-KYSAFE1 (597-2331). Before reporting, explain to the child's caregiver(s) that:

- The child sustained a serious brain injury not explained by the history.
- You are a mandated reporter who is legally required to make a child abuse report.
- You will contact social services and law enforcement agencies, which will investigate.

Avoid sharing details of your clinical findings or suggesting possible explanations for the injuries. (Such discussions could affect later forensic interviews and child abuse investigations.) It may be helpful to have a social worker present.

Immunity for Reporters

[From Kentucky Rev. Stat. Ann. § 620.050(1)]

Anyone acting upon reasonable cause in making a report or acting in good faith shall have immunity from any liability, civil or criminal, that might otherwise be incurred or imposed. Any such participant shall have the same immunity with respect to participation in any judicial proceeding resulting from such report or action.

Failure to Report or False Reporting

[Rev. Stat. § 620.990(1) and Rev. Stat. § 620.050(1)]

Any person intentionally violating the provisions of this chapter shall be guilty of a Class B misdemeanor. Any person who knowingly makes a false report and does so with malice shall be guilty of a Class A misdemeanor.

Who Makes a Report

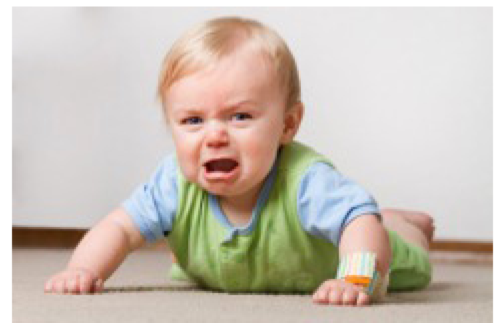
In a 2001 Children's Bureau review of reporters in the United States, professionals made nearly 60% of reports of alleged child abuse and neglect (Children's Bureau, 2011). A "professional" is a person who has contact with the alleged child maltreatment victim as part of their job.

Nonprofessionals—friends, neighbors, and relatives—submitted just under 20% of reports. Unclassified, anonymous, and unknown sources submitted about 25% of child abuse and neglect reports (Children's Bureau, 2011). The three largest report sources were teachers, legal and law enforcement personnel, and social services personnel.

Incidence of Pediatric Abusive Head Trauma

Children are at highest risk for SBS/AHT when they are from 2 to 4 months old. All babies less than 1 year of age are at high risk for SBS/AHT because they cry longer and more frequently and they are easier to shake than older, larger children.

For children under 1 year of age, the incidence of SBS/AHT varies, ranging from 20 to 30 cases per 100,000 children (Parks et al., 2012). A study of pediatric abusive head trauma cases in North Carolina suggested that as many as 3 to 4 American children each day experience severe or fatal head injuries as a result of child abuse (CDC, 2012).



Source: Shutterstock. Used by permission.

The peak incidence and rapid decrease of SBS/AHT after this age are thought to be related to a decrease in the episodes of prolonged, inconsolable, and unpredictable crying (Parks et al., 2012). Nevertheless, AHT injuries have been reported in children up to age 5 (CDC, 2012).

Researchers at Yale University used the 2006 Kids' Inpatient Database to determine the incidence of abusive head injuries and fractures in children under the age of 36 months. They looked at traumatic brain injuries only, traumatic brain injuries with skull fracture, and skull fractures only. They found an overlap in traumatic brain injuries and fractures attributable to abuse. Among children less than 12 months, traumatic brain injuries and/or fractures attributable to abuse occurred in 1 of 2000. Falls occurred more commonly than abuse, even among very young children (Leventhal et al., 2010). We will consider falls later in the course.

Scope of Child Maltreatment in Kentucky

Kentucky has one of the highest rates of child maltreatment in the country (Children's Bureau, 2011). In 2012 among the more than 1 million children living in Kentucky there were nearly 35,000 abuse or neglect reports that met the criteria for investigation. Nearly 10,000 of those reports—involving more than 15,000 children—were substantiated by investigators. Within this group, 22 fatalities and 33 near-fatalities were substantiated as related to abuse or neglect (Dept of Community Based Services, 2012).

In an attempt to uncover child abuse trends and risk factors in Kentucky, the Department of Community Based Services (DCBS) examined 214 cases of child abuse and neglect that resulted in death or serious injury between 2008 and 2012. In the DCBS review, the 214 children whose death or serious injury was the result of abuse or neglect, 57% were boys and 43% were girls (DCBS, 2012). Caucasian children accounted for 79% of the fatalities or near-fatalities and African American children accounted for 12% (DCBS, 2012). Head injury was by far the most common type of physical abuse, accounting for nearly half of the deaths and serious injuries (DCBS, 2012).

In Kentucky 91% of all cases of fatal or near fatal *physical abuse* were under the age of 4 (DCBS, 2012). The age of the child is consistently seen by caseworkers and policymakers as a predictive factor in cases of death or serious injury.

In Kentucky, as elsewhere, the age of the abuser is a factor in child abuse and neglect. In the 214 cases examined by DCBS, 77% of female and 54% of male perpetrators were below the age of 30 (DCBS, 2012).

Difficulties in Tracking Occurrence

It is difficult to ascertain the exact number of shaken baby cases because many are under-reported or never receive a diagnosis. The International Classification of Diseases (ICD) is used to code and classify mortality data from death certificates (see box below). Tracking AHT is challenging because the ICD-10 maltreatment syndrome codes (T74 or Y07) and the ICD-9-CM shaken baby syndrome code (995.55) are under-utilized by professionals who use the ICD coding system (Parks et al., 2012). This may result from a lack of information about the specific circumstances of the injury at the time the death certificate was completed or from a reluctance of physicians to diagnose and code for shaken baby syndrome.

ICD-10 abuse/maltreatment codes are not specific enough to capture the circumstances surrounding child assault, abuse, and maltreatment and to specify the types of perpetrators. Cause-of-death data, especially pertaining to assignment of abuse/maltreatment codes, could be improved if law enforcement records and state and local child death review systems was made available to the medical examiner or coroner before they certified the causes of death on the death certificate (Parks et al., 2012).

Classification of Diseases, Functioning, and Disability

The International Classification of Diseases (ICD) is used to code and classify mortality data from death certificates. It is designed to promote international comparability in the collection, processing, classification, and presentation of mortality statistics.

These coding rules, published by the World Health Organization, improve the usefulness of mortality statistics by giving preference to certain categories, by consolidating conditions, and by systematically selecting a single cause of death from a reported sequence of conditions. The single selected cause of death is called the "underlying cause of death," and the other reported causes are "non-underlying causes of death." The combination of underlying and non-underlying causes is the "multiple causes of death."

Lack of Consistency Limits Public Health Response

The lack of consistent information about the number of children affected by abusive head trauma limits the ability of the public health community to respond to this problem. It hinders attempts to gauge the magnitude of abusive head trauma in relation to other public health problems.

This lack of consistency also creates challenges in identifying those groups at highest risk who might benefit from focused intervention or increased services. It hampers efforts to monitor changes in the incidence and prevalence of abusive head trauma over time. In turn, this impedes the ability to monitor the effectiveness of abusive head trauma prevention and intervention activities (Parks et al., 2012).

Child Maltreatment and Later-Life Health

Adverse childhood experiences including verbal, physical, or sexual abuse as well as family dysfunction, have been linked to a range of negative health outcomes in adulthood. Among them are substance abuse, depression, cardiovascular disease, diabetes, cancer, and premature mortality (MMWR, 2010).

The Adverse Childhood Experiences (ACE) Study assessed the association between childhood maltreatment and later-life health and well-being. The study examined whether a history of adverse childhood experiences was common in a randomly selected population of 26,229 adults in five states. Nearly 60% of respondents reported having at least one adverse childhood experience, and 8.7% reported five or more adverse childhood experiences (MMWR, 2010).

The ACE Study findings suggest that certain adverse experiences are major risk factors for the leading causes of illness and death as well as poor quality of life. Progress in preventing and recovering from health and social problems is likely to benefit from understanding that many of these problems arise as a consequence of adverse childhood experiences.

Triggers/Risk Factors for Shaken Baby Syndrome

A **trigger** is a prompt or external stimulus that leads to a behavior or causes a response—something that “sets you off.” Triggers tell us “Do something now!” A trigger can be internal (fatigue, frustration, anger, desire) or external (a crying baby, a remark). It is known that certain triggers and risk factors increase the likelihood of a parent or caregiver’s abusing an infant.

A **risk factor** is any characteristic of a person, a situation, or a person’s environment that increase the likelihood that a person will engage in a particular behavior.

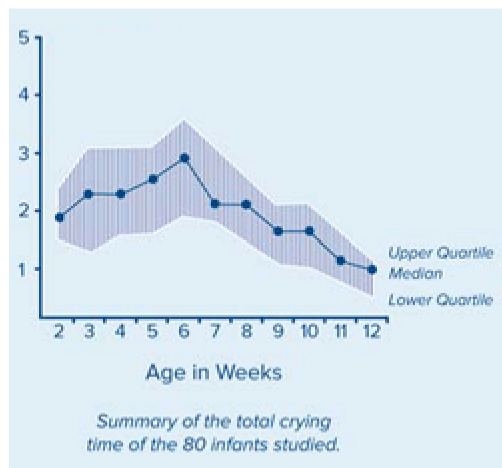
Triggers and risk factors are often related. For example, a crying baby often affects a mother's sleep, triggering frustration on the part of the mother. The mother's frustration may in turn trigger an emotional response in her male partner, telling him to "do something now." The trigger is associated with the mother's frustration and tiredness but the acting out often happens with the male. Helping parents and caregivers understand what triggers abusive behavior is the first step in preventing child abuse.

Triggers Associated with Shaking a Baby

Episodes of Crying

Inconsolable or excessive crying is the most common trigger for shaking a baby. Episodes of crying typically increase in the first month after birth, peak in the second month, and decrease thereafter (Parks et al., 2012). This is expressed in the chart below, which shows the normal and expected hours of fussing and crying from birth to 3 months of age.

Infant Fussing per 24 Hours, Birth to 3 Months



Source: CDC.

Source: CDC.

Infant crying can be a frustrating issue for parent and caregivers who may not understand that crying is a normal development stage and will decline as the baby ages. A parent's perception of crying as a problem is the most common risk factor for SBS. Problem crying is also associated with early weaning from breast milk, frequent changes of formula, and parent depression symptoms (Cook et al., 2012).

Colic and the Rule of Threes (Wessell Criteria)

According to many experts, colic is inconsolable crying in an infant that lasts many hours a day, starting in the second week of life and lasting until about 3 months of age. About forty years ago, a pediatrician named Morris Wessel conducted a breakthrough study on excessively fussy children. The definition he chose to describe colicky babies was not considered scientific, but it stuck with physicians.

Wessel's definition of a colicky infant was a child who cried for more than **3 hours** a day, for more than **3 days** a week, for **over 3 weeks**. This is often referred to as the Rule of Threes and these rules came to be known as the Wessell Criteria, which are now used in most current studies of babies with colic (Amer Preg Assoc, 2013).

The natural course of infant colic symptoms appear by around 3 weeks, peak at 8 weeks, and remit beyond 12 weeks of a term infant's chronological age. Infant colic affects up to 20% of infants under 3 months. Infant colic has significant adverse effects on maternal mental health and family quality of life and is a trigger for child abuse and a risk factor for shaken baby syndrome. Infants in whom crying persists beyond 3 months are at risk of adverse outcomes in the school years, including anxiety, aggression, hyperactivity, allergy, and sleep disorders, and at more than double the risk of poor mental health in later years (Sung et al., 2012).

Infant Sleep Problems

Fifteen to thirty-five percent of parents report problems with their infant's sleep during the first 6 months of life. Common sleep problems include difficulty getting the infant to sleep at the start of the night and difficulty re-settling the infant overnight (Cook et al., 2012).

Preventing infant sleep problems may reduce rates of parental depression, which is particularly important with breast feeding mothers who may be reluctant to accept pharmacologic treatment for depression (Cook et al., 2012).

Maternal Fatigue and Depression

Postpartum maternal tiredness/fatigue is defined as an imbalance between activity and rest. Fatigue is a state which persists through the circadian rhythm and cannot be relieved through a single period of sleep (Kurth, et al, 2010).

Most new mothers report problems with tiredness or fatigue, and disquieting infant crying is the most commonly reported reason parents consult a health professional. Not surprisingly, the occurrence of postnatal tiredness is associated with the amount of infant crying. In the worst case, infant crying and increasing exhaustion can accumulate into a vicious circle and negatively affect family health (Kurth et al., 2010).

Comforting a crying baby while coping with personal tiredness can be a challenge. Maternal exhaustion has been identified as a predictor of postpartum depression, and persistently crying infants are at a higher risk for shaken baby syndrome or other forms of child abuse (Kurth et al., 2010).

Risk Factors for Child Maltreatment

> There is really no particular personality type that's at risk. We all are at risk, and I think that it would be unfair of us to think that none of us can get frustrated by a crying baby. And we've all been frustrated by babies who are just crying, but most of us have the social support, we have some knowledge, we have self-control that we don't take these frustrations out on our really helpless young infants. But there are individuals, who because of what's going on and the stress that they have in their lives and the lack of social supports and their self-esteem and sometimes their lack of knowledge, they do take these frustrations out on babies.
>
> We know that the majority of perpetrators of abusive head trauma are men, but we use that really in terms of thinking about prevention because women can harm children just as well as men. We also know that one of the strong risk factors is having an unrelated adult living in a household; we have many cases where a young mother, or a mother of a young baby, has a boyfriend living in the house. The boyfriend may not be biologically related to the child, and often when that young man is left in a caregiving role for that child, sometimes bad things happen. Those kinds of risk factors help us target prevention efforts and help us think about prevention, but in my mind, really, any adult who is tired and stressed, who is dealing with an irritable crying baby, is at risk.
>
> Cindy Christian, MD
> NICHD, 2013

Risk factors are characteristics associated with child maltreatment—they may or may not be direct causes. Certain characteristics have been found to increase a child's risk of being maltreated or a parent or caregiver's risk of abusing a child.

Although all caregivers are at risk for shaking a child, the presence of **substance abuse**, **domestic violence**, and **mental health issues** greatly increases the risk for an adult's committing child abuse or neglect. There is a higher incidence of fatalities and near-fatalities when these three factors are present (DCBS, 2012).

Many abusive parents believe that children exist to satisfy parental needs and that the child's needs are unimportant. Abusive parents may show disregard for the child's own needs, feelings, and limited abilities. Children who don't satisfy the parent's needs may become victims of child abuse.

Risk Factors for Victimization

According to Child Protective Services (CPS), more than 3.7 million children in the United States were the subjects of at least one CPS report in 2011. About 20% of these children were found to be victims of some sort of abuse (Children's Bureau, 2011).

Nationally, victims in the age group of birth to 1 year have the highest rate of victimization. This is split between the sexes, with boys accounting for 48.6% and girls accounting for 51.1%. Eighty-seven percent of victims were comprised of three races or ethnicities: White (43.9%), African American (21.5%), and Hispanic (22.1%) (Children's Bureau, 2011).

Special needs that may increase caregiver burden such as disabilities, mental retardation, mental health issues, and chronic physical illnesses also put a child at increased risk for maltreatment.

In the 2012 review of child abuse cases in Kentucky, the Department of Community Based Services (DCBS) uncovered the following risk factors that appeared to increase an infant's risk of being shaken, particularly when combined with a parent or caregiver who is not prepared to cope with caring for a baby:

- Babies less than 1 year of age
- Infant prematurity or disability
- Being one of a multiple birth
- Prior physical abuse or prior shaking

Risk Factors for Perpetration

A **perpetrator** is the person who is responsible for the abuse or neglect of a child. Perpetrators come from all walks of life, races, ethnicities, religions, and nationalities. They come from all professions and represent all levels of intelligence and standards of living. There is no single social group free from incidents of child abuse.

In 2011 the Children's Bureau, using data from CPS reports, found that for all forms of child abuse and neglect:

- Four-fifths (84.6%) of perpetrators were between the ages of 20 and 49 years.
- Four-fifths (80.8%) of perpetrators were parents.
- Of the perpetrators who were parents, 87.6% were the biological parents. (Children's Bureau, 2011)

Analysis of perpetrator's confessions indicate that the majority of perpetrators are male and are most likely to be fathers, followed by boyfriends, female babysitters, and mothers, in descending order (Chiesa and Duhaime, 2009).

Parents who lack an understanding of a child's needs or who lack child development and parenting skills are at increased risk for maltreating a child under their care. Parents with a history of child maltreatment in their own family and parental thoughts and emotions that tend to support or justify maltreatment behaviors are also at increased risk of maltreating a child.

Substance abuse and mental health issues (eg, depression) put a parent or caregiver at increased risk for committing child abuse. Parental characteristics such as young age, low education, single parenthood, large number of dependent children, and low income are also risk factors for committing child maltreatment. A nonbiological transient caregiver in the home—such as the mother's male partner—is a risk factor for child abuse.

Family Risk Factors

Social isolation, family disorganization, dissolution, and violence—including domestic violence—are risk factors for a parent of caregiver committing child abuse. If a parent is stressed, has a poor relationship with the child, or engages in negative interactions with the child, they are at increased risk for committing child abuse.

Children may be in a caretaker role—for example, as a babysitter—and may be responsible for abusing a child in their care. Any adult caretaker may be considered responsible if they delegate care responsibilities to an inappropriate minor caregiver. A mandatory reporter who suspects that abuse has occurred when one child is caring for another is required by law to make a child abuse report.

Community Risk Factors

Certain factors within the community can increase the risk of a parent or caregiver's committing child abuse. Community violence, high community poverty rates, residential instability, high unemployment rates, high density of alcohol outlets, and poor social connections can increase the likelihood of a parent or caregiver abusing a child under their care.

Six Factors Protective Against Child Maltreatment

Protective factors are those factors that reduce or eliminate the risk of an infant's being shaken or abused. Protective factors serve as buffers, helping parents who might otherwise be at risk of abusing their children to find resources, supports, or coping strategies that allow them to parent effectively, even under stress.

Certain protective factors decrease a child's risk of being abused while other protective factors decrease a parent or caregiver's risk of abusing a child. Six specific protective factors have been shown to be particularly effective in the prevention of child abuse. Research has shown that these protective factors are linked to a lower incidence of child abuse and neglect (CWIG, 2013).

1. Nurturing and Attachment

A child's early experience of being nurtured and developing a bond with a caring adult affects all aspects of behavior and development. When parents and children have strong, warm feelings for one another, children develop trust that their parents will provide what they need to thrive, including love, acceptance, positive guidance, and protection (CWIG, 2013).

2. Knowledge of Parenting and Child Development

Discipline is both more effective and more nurturing when parents know how to set and enforce limits and encourage appropriate behaviors based on the child's age and level of development. Parents who understand how children grow and develop can provide an environment where children can live up to their potential. Child abuse and neglect are often associated with a lack of understanding of basic child development or an inability to put that knowledge into action. Timely mentoring, coaching, advice, and practice may be more useful to parents than information alone (CWIG, 2013).

3. Parental Resilience

Resilience is the ability to handle everyday stressors and recover from occasional crises. Parents who are emotionally resilient have a positive attitude, creatively solve problems, effectively address challenges, and are less likely to direct anger and frustration at their children. In addition, these parents are aware of their own challenges—for example, those arising from inappropriate parenting they received as children—and accept help and/or counseling when needed (CWIG, 2013).

4. Social Connections

Evidence links social isolation and perceived lack of support to child maltreatment. Trusted and caring family and friends provide emotional support to parents by offering encouragement and assistance in facing the daily challenges of raising a family. Supportive adults in the family and the community can model alternative parenting styles and can serve as resources for parents when they need help (CWIG, 2013).

5. Concrete Supports for Parents

Many factors beyond the parent-child relationship affect a family's ability to care for their children. Parents need basic resources such as food, clothing, housing, transportation, and access to essential services that address family-specific needs (eg, childcare, healthcare) to ensure the health and well-being of their children. Some families may also need support connecting to social services such as alcohol and drug treatment, domestic violence counseling, or public benefits. Providing or connecting families to the concrete supports that families need is critical. These combined efforts help families cope with stress and prevent situations where maltreatment could occur (CWIG, 2013).

6. Social and Emotional Competence of Children

Just like learning to walk, talk, or read, children must also learn to identify and express emotions effectively. When children have the right tools for healthy emotional expression, parents are better able to respond to their needs, which strengthens the parent-child relationship. When children's age, disability, or other factors affect their needs and the child is incapable of expressing those needs, it can cause parental stress and frustration. Developing emotional self-regulation is important for children's relationships with family, peers, and others (CWIG, 2013).

Professional Training

Providing training about protective factors for all people who work with children and families helps build a workforce with common knowledge, goals, and language. Professionals, from frontline workers to supervisors and administrators, can benefit from training that is tailored to their role and imparts a cohesive message focused on strengthening families.

Strategies for enhancing professional development:

- Provide trainings on protective factors to current trainers so they can teach others.
- Integrate family-strengthening themes and the protective factors into college, continuing education, and certificate programs for those working with children and families.
- Incorporate family-strengthening concepts into new-worker trainings.
- Develop online training and distance learning opportunities.
- Provide training at conferences and meetings.
- Reinforce family-strengthening training with structured mechanisms for continued support, such as reflective supervision and ongoing mentoring (CWIG, 2013)

Assessment and Diagnosis of SBS/AHT

> For reasons inexplicable to many physicians, and unbeknownst to many others, the diagnosis of abusive head trauma/shaken baby syndrome remains a lightning rod for controversy. Public media articles continue to be published. Legal articles continue to be written. And judicial commentary on the science continues to occur.
>
> Narang et al., 2013

Although shaken baby syndrome/abusive head trauma is known by many names, and disagreement continues over its exact causes, abusive head trauma has long been recognized as a clinically valid medical diagnosis (Narang, 2011). As far back as 1974, Caffey described a constellation of injuries that included subdural hematoma, long-bone fractures, and retinal hemorrhages. If this occurred in the absence of a reasonable history of trauma or other medical condition, Caffey referred to these injuries as “the whiplash shaken infant syndrome.” These types of injuries continue to be hallmarks for abusive head injury (Chiesa and Duhaime, 2009).

Clinical Presentation

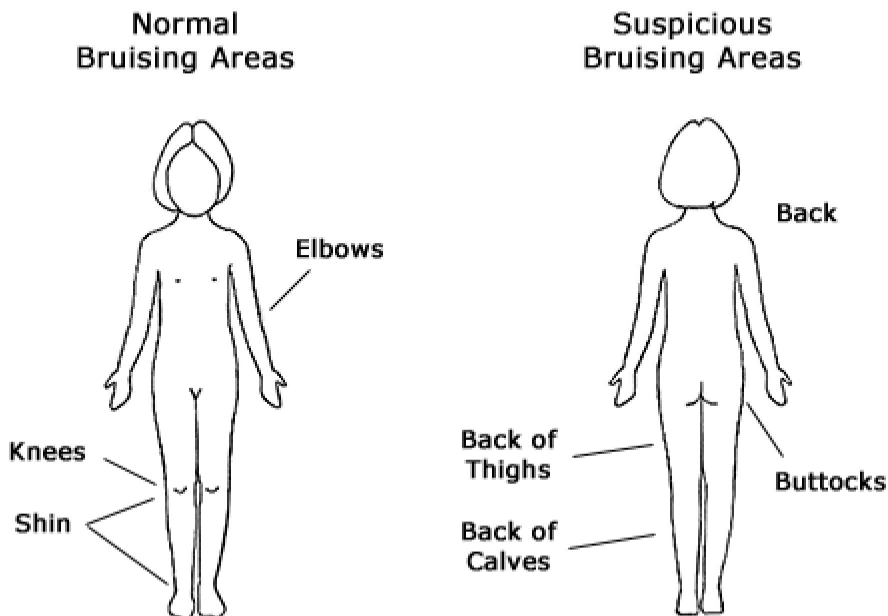
During the initial interview, healthcare providers should be aware of a possible SBS/AHT injury in any infant or young child who presents with a history that is not plausible or consistent with the presenting signs and symptoms. During the initial assessment, ask who is caring for the child and be alert for the presence of a new adult partner in the home. The absence of a primary caregiver at the onset of injury or illness should be noted. If the parent or caregiver has delayed seeking medical care for the child in the past, or if there is a previous history or suspicion of abuse, child abuse may be suspected.

During the physical exam, physical evidence of multiple injuries at varying stages of healing or unexplained changes in neurologic status, unexplained shock, or cardiovascular collapse are indicators of possible abuse. If a traumatic cause of injury is not obvious, careful assessment is warranted (Chiesa and Duhaime, 2009). Pay close attention to skin, abdominal, and skeletal systems to assess for additional trauma. In addition to a thorough history and physical exam, ophthalmologic examination, computerized tomography, magnetic resonance imaging, and skeletal surveys may be used in the diagnosis of SBS/AHT.

Symptoms and Types of Childhood Injuries

In some cases, even though extensive damage may have occurred, there may not be any physical signs of injury (bruising, bleeding, swelling). Accidental childhood injuries usually involve bony areas such as shins, elbow, and knees. Toddlers learning to walk will fall and skin or bruise these areas, just as slightly older children may do the same while learning to ride a bicycle. Suspicious injuries usually occur in areas that are not susceptible to accidental injuries typical for the child's age (NYSOCFS, 2011).

Evaluating Bruising Areas



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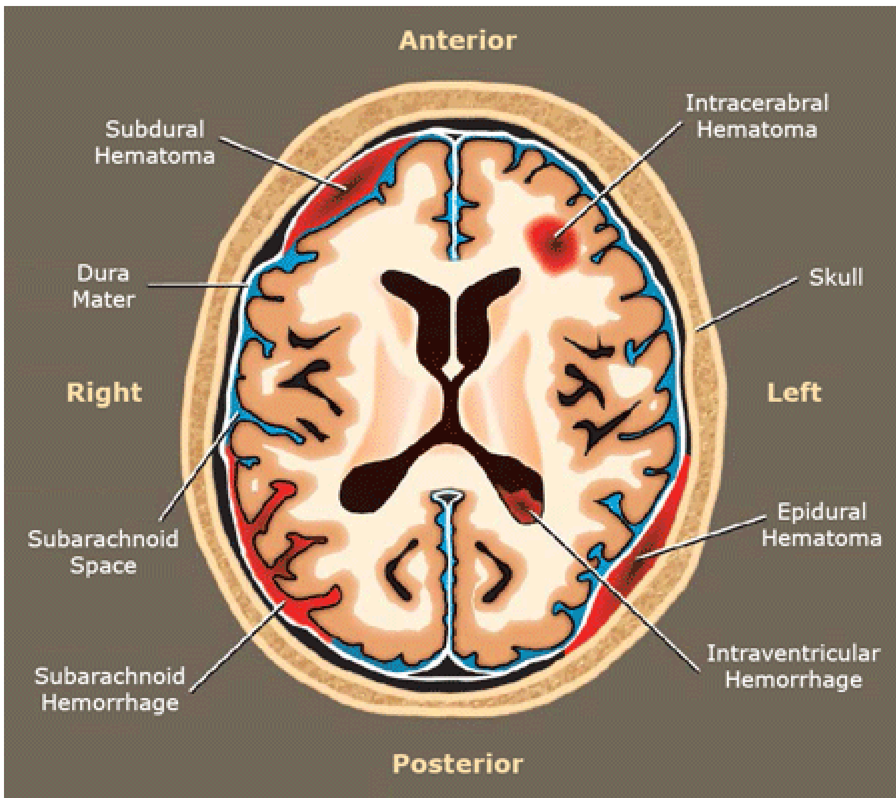
Although subdural hematoma, retinal hemorrhage, and cerebral edema are the best-known indicators of SBS/PAHT, additional symptoms, which can vary from mild to severe, should be noted:

- Brain damage
- Spinal cord injury
- Seizures
- Decreased alertness
- Extreme irritability or other changes in behavior
- Lethargy, sleepiness, not smiling
- Loss of consciousness, pale or bluish skin
- Not breathing or difficulty breathing
- High-pitched cry
- Lack of appetite, vomiting
- Increased head circumference, which may indicate chronic subdural hematoma

A number of conditions can mimic abusive head injury. These include birth trauma, congenital malformations, accidental trauma, genetic and metabolic conditions, infectious diseases, hematologic disorders, surgical complications, toxins, vasculitides (inflammation of blood vessels), nutritional deficiencies, and oncologic processes (Chiesa and Duhaime, 2009).

Hematoma Types in the Brain

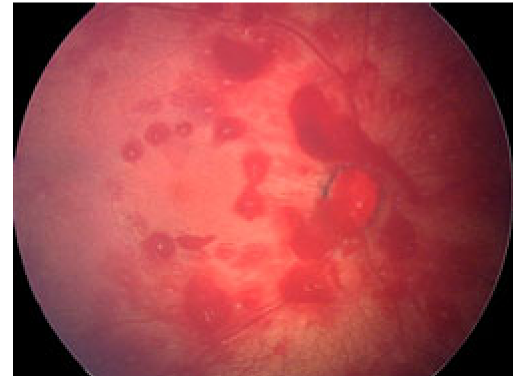


Source: National Highway Traffic Safety Administration, 2012.

Suspected abusive head trauma may present with a spectrum of symptoms, from mild to severe. In mild cases, signs and symptoms such as irritability, sleepiness, vomiting, or poor feeding are common to a wide variety of pediatric illnesses or injuries.

In the case of more severe injuries, subdural and/or subarachnoid hemorrhage with varying degrees of neurologic signs and symptoms, retinal hemorrhage, physical or radiologic evidence of contact to the head, upper cervical spine injuries, and skeletal injuries may be present (Chiesa and Duhaime, 2009).

Retinal Hemorrhage



Retinal hemorrhage in an infant subject to abusive head trauma. Courtesy University of Edinburgh students (wiki).

Accidental injuries, often related to falls, are a commonly reported cause of head injury in children. When researchers at the University of Texas Health Science Center at San Antonio looked at evidence about short falls (a fall of less than 1.5 meters), they concluded:

- When caregivers have been surveyed, they report that short falls are common, but severe injuries from short falls are rare.
- Short falls occurring in objective settings, such as hospitals, have not resulted in subdural hematoma or death.
- Children in large, licensed daycares rarely die from short falls.

- Well-designed, prospective studies reveal that severe injuries or death resulting from short falls are rare events.
- Systematic reviews of the short fall literature indicate that short falls rarely cause death in children.

Completing the Diagnosis

A diagnosis begins with the chief complaint and the presenting symptoms. This is followed by a complete medical history, a detailed trauma history, and a complete physical examination. Gathering information from social services and other medical specialties (radiology, neurology, ophthalmology) provides important history and perspective. Keep in mind that, in the vast majority of cases, the common denominator for subdural hematoma and retinal hemorrhage is trauma (Narang, 2013).

More than any other diagnosis, a clinician who suspects child abuse must consider inconsistencies, which may include a history that is:

- Absent in the presence of severe injuries
- Inconsistent with the known developmental capabilities of the child
- Pathophysiologically inconsistent with the injuries
- Inconsistent with clinical studies and statistical information on subdural hematomas and retinal hemorrhages (Narang, 2013)

Interventions and Prevention of SBS/AHT

> The first thing to know is that crying in a young baby is often normal; it's part of their neurological development. As pediatricians, we teach parents that if you know the baby has been fed, is not sick, is clean, and is not injured or hurt, then it's okay to put the baby down if the baby is crying because that baby is simply at the time of the day where they cry a lot.
>
> I don't know any baby who ever cried themselves to death, but I do know of too many cases where parents got frustrated by the baby crying and we ended up in a really quite terrible situation. We always want parents to have a support system. If you are the primary caregiver and you've reached your end, it's always appropriate to say to a partner, grandparent, a support person, or somebody you trust, "Can you take over because I've had enough of the crying baby?" And it's also perfectly fine to take a crying baby and put them in a nice safe sleep environment like a crib and walk away and calm yourself down, do something that relaxes you and rejuvenates you so you don't get frustrated with this crying baby.
>
> Cindy Christian, MD
> NICHD, 2013

Shaking most often occurs in response to a baby crying or other factors that can trigger the person caring for the baby to become frustrated or angry. Family members, friends, and healthcare providers can help parents understand that it's okay for a baby to cry, especially from 2 to 8 weeks of age. The problem is not the crying, it's how a caregiver responds to it.

Giving parents and caregivers tools that help them cope with frustration while caring for a baby are important components of any SBS prevention program. Health professionals play a key role in reinforcing prevention by helping parents and caregivers understand the dangers of violently shaking a baby, the risk factors and the triggers for it, and ways to lessen the load on stressed-out parents and caregivers, all of which may help to reduce the number of cases of SBS.

Behavioral strategies such as **graduated extinction** (where the parent returns to check on their crying child at increasing time intervals with brief parental reassurance) and positive bedtime routines have been shown to be effective strategies for managing sleep problems in children aged 6 months or older (Cook et al., 2012). A program that provides parents with information about normal sleep and cry patterns and ways to reduce stimulation and provide a predictable environment in the first few months of life may be able to prevent both infant sleeping and crying problems.

Shaken Baby Syndrome Prevention Programs

Many prevention and education programs strive to raise awareness about SBS, educate parents and other caregivers about the serious effects of SBS-related injuries, and inform them about infant crying behavior and safe ways to reduce and prevent SBS injuries. Examples of common prevention strategies include:

- Coordinated hospital-based primary prevention programs targeting parents of newborns.
- Home visits for new parents
- Anticipatory guidance at well-baby visits in pediatric practice or health clinics.
- School prevention programs for junior high and high school students providing them with an understanding of child maltreatment issues, anger management techniques, and child care skills.

The Period of PURPLE Crying

Established in 1990, the National Center on Shaken Baby Syndrome is the only organization in the world dedicated solely to the prevention of shaken baby syndrome. The center has developed a number of educational tools and programs, including the popular and effective Period of PURPLE Crying (PURPLE) program. The program was designed by Ronald Barr, a developmental pediatrician and leading researcher on infant crying, and Marilyn Barr, founder and director of the center.

The Period of PURPLE Crying program is a public health education approach to SBS/AHT that recognizes excessive crying as a normal part of child development. It stresses that infants go through a normal period of crying that comes and goes unexpectedly, starting at about 2 weeks of age and peaking at 2 to 3 months of age. Numerous research studies from throughout the world have shown that parents who received training and materials through the PURPLE program are more knowledgeable about infant crying and are more likely to share their knowledge with other caregivers (Jenny, 2009).

The Letters in PURPLE Stand for

P	U	R	P	L	E
PEAK OF CRYING	UNEXPECTED	RESISTS SOOTHING	PAIN-LIKE FACE	LONG LASTING	EVENING
Your baby may cry more each week. The most at 2 months, then less at 3-5 months	Crying can come and go and you don't know why	Your baby may not stop crying no matter what you try	A crying baby may look like they are in pain, even when they are not	Crying can last as much as 5 hours a day, or more	Your baby may cry more in the late afternoon and evening

The word ***Period*** means that the crying has a beginning and an end.

As illustrated above, each of the letters in PURPLE stand for a property of crying in healthy infants that can frustrate parents and caregivers:

- **P** = **peak pattern**, in which crying increases at about 2 weeks, peaks in the second to third month, and then declines
- **U** = **unexpected** bouts of prolonged crying that come and go
- **R** = **resistance** to soothing
- **P** = **pain-like** look on the child's face when they are crying
- **L** = **long** crying bouts—up to 35 or 40 minutes per bout
- **E** = bouts of crying tend to occur in the late afternoon and **evening** although they can happen at any time of the day

The PURPLE program also emphasizes three main points:

- Parents are encouraged to use typical calming responses (carry, comfort, walk, talk) with their infants.
- If the crying is too frustrating, it is okay put the baby down in a safe place, walk away, calm yourself, and then return to check on the baby.
- Never shake a baby. (Barr et al., 2009)

Labor and delivery nurses, discharge nurses, and health educators can distribute the Period of PURPLE Crying program materials to new parents prior to the baby's discharge from the hospital or birthing center. Program materials include an educational video and booklet for new parents and other caregivers to help them understand and cope with infant crying. The materials provide strategies for comforting a baby, explain the dangers of shaking, and suggest a positive approach to handling an inconsolable infant. Materials may also be distributed or reinforced by pediatricians, public health workers, adoption agencies, and other organizations interacting with new parents (AHRQ Healthcare, 2013).

The National Center on Shaken Baby Syndrome also offers a school-based program for junior and senior high school students, which teaches students about the medical aspects of shaking injuries, combined with basic anger management and childcare skills. Teaching students how frustration can lead to shaking emphasizes the importance of appropriate coping skills.

There are also programs targeting males, especially new fathers, with information and resources for providing safe and nurturing care for their new infants and safe strategies for coping with frustration caused by crying babies. Other programs emphasize professional education and trainings for doctors, nurses, therapists, social workers, and others providing family services.

The Period of PURPLE Crying

- It is part of the infant's normal development and occurs in all babies.
- It differs from colic, which is an abnormality that occurs in some, but not all, babies.
- It differs from crying associated with illness, which may be related to an acute episode of illness with other symptoms such as diarrhea.

Getting the Prevention Message Out

States or communities have used any one or all elements of a three-pronged strategy for disseminating and teaching the materials to parents. The strategy encourages hospitals, birthing centers, and adoption agencies to distribute materials and provide education about SBS/AHT to parents and caregivers at birth or adoption. Medical groups and other organizations that cater to new parents are encouraged to distribute the materials and reinforce key messages about prevention. Finally, state and communities are encouraged to use a public education campaign to raise awareness and highlight key messages (AHQR, 2013).

Distribution at Birth

Trained staff at hospitals and birthing centers are encouraged to distribute the DVD called "Crying, Soothing and Coping: Doing What Comes Naturally" and a full-color, 10-page booklet (packaged together) to all new parents, using an established protocol. As part of the protocol, nurses and health educators first view a 27-minute online training presentation that explains the material and its evidence base and that emphasizes the importance of distribution to all new parents (AHQR, 2013).

The protocol offers various resources to use with new parents. These include talking points (with 3- and 10-minute versions available depending on the organization's discharge processes) and a teach-back educational strategy that uses the program booklet to educate new parents and verify understanding. Once trained, the nurse or health educator distributes materials to all new parents, introduces the content, reviews the booklet (particularly the acronym PURPLE), and ideally plays the video for the parents. The nurse or educator also advises parents to share the materials with all the baby's caregivers.

Reinforcement by Other Organizations

During their regular interactions with new parents, pediatricians, public health workers, and representatives of foster care agencies, home visitation programs, and adoption agencies are encouraged to ask parents and caregivers if they have received the Period of PURPLE Crying materials. If so, they reinforce the key educational messages. If not, they give the materials to the parents and provide an overview of them.

Public Education Campaigns

Some organizations have sponsored communitywide media campaigns to promote the sharing of program materials. These campaigns may include radio or television advertisements, social media, or participation in a yearly campaign, called *CLICK for Babies*, to collect purple-colored baby caps from knitters and crocheters across the country (AHRQ, 2013). Click here for more information about the CLICK for Babies program.

Key Points for Medical Providers

- Remind parents and caregivers that crying is normal for babies.
- Infant crying normally increases at 2 to 3 weeks of age, peaks around 6 to 8 weeks of age, and tapers off when the baby is 3 to 4 months old.
- During medical visits, ask parents how they are coping with parenthood and their feelings of stress.
- Remind parents that they may experience a sudden decrease in sleep, but that things will get better.
- Encourage parents to check for signs of illness, fever, unusual behavior, or discomfort.

Opinions About Shaken Baby Syndrome

There are generally **two schools of thought** (see below) concerning the degree and type of force needed to cause the triad of injuries used to define SBS. Many believe shaking alone is sufficient to cause traumatic brain injury, while others believe that shaking plus some form of cranial impact is required to cause traumatic brain injury (Ramsey, 2006).

Shaking Alone Can Cause Brain Injury

Many clinicians and researchers believe that most adults possess sufficient strength to shake an infant or toddler to the point of causing intracranial injuries that can ultimately cause death or bodily harm without any form of cranial impact or blunt force trauma. This view first gained a foothold within the medical community in 1974 when physician John Caffey postulated the "whiplash shaken baby syndrome" theory, stating that shaking alone could produce the forces sufficient to cause both subdural hematomas and retinal hemorrhages in small children. Caffey took his theory one step further and stated that finding a subdural hematoma and retinal hemorrhages in an infant with no external signs of cranial trauma was absolutely and exclusively diagnostic of child abuse (Ramsey, 2006).

Shaking Alone Cannot Cause Brain Injury

About 1987 the first skeptics began questioning the accuracy of Caffey's study and his theory. One of the first was physician Ann-Christine Duhaime, who observed that "while the term shaken baby syndrome has become well entrenched in the literature of child abuse, it is characteristic of the syndrome that a history of shaking in such cases is lacking."

Duhaime conducted a biomechanical study to determine whether an adult could, by means of shaking alone, exert sufficient force to produce traumatic brain injury in infants. Using infant models, Duhaime and her team subjected proportionately correct models to a series of shaking events, some of which were followed by an impact. Duhaime observed that shaking alone produced at most only a mere fraction of the force the previous studies had determined was required to cause subdural hematomas, retinal hemorrhages, or diffuse axonal injury (Ramsey, 2006).

When the shakers were asked to create an impact by slamming the models' heads into a fixed object, Duhaime observed that the force produced was 50 times greater than that of shaking alone. As a direct result, Duhaime and her team concluded that "severe head injuries commonly diagnosed as shaking injuries require impact to occur and that shaking alone in an otherwise normal baby is unlikely to cause the shaken baby syndrome." As a result of this questioning, the view referred to as "shaken impact syndrome" emerged (Ramsey, 2006).

For more on the controversy surrounding SBS, please listen to the following National Public Radio interview in which Norman Guthkelch, a retired pediatric neurosurgeon who is credited with connecting shaking a baby with subdural hematomas. The interview with Guthkelch provides a thought-provoking overview of the issues involved. For early work, see also Guthkelch, 1971, in References. Click here to listen to the interview.

Never, Ever Shake a Baby

Recognizing, diagnosing, treating, and ultimately preventing pediatric abusive head trauma and shaken baby syndrome are urgent public health goals. Educating parents and caregivers and providing them with the tools and support to understand when infant crying is normal and when it is something more is the key to preventing frustrated reactions that may lead to abuse.

For those who have regular contact with infants and their parents or caregivers, understanding risk factors is critical. For healthcare providers, knowledge of the latest science about abusive head trauma will guide assessments and diagnoses.

Public health workers, teachers, and others who work with infants and children have the opportunity to educate parents and caregivers about child abuse. They are critical frontline workers who can intervene to protect vulnerable infants when they see signs of potential child abuse.

No matter your occupation or responsibilities, whether you are a parent, a caregiver, a community member, or a healthcare provider, the message is clear and simple:

Never, ever, shake a baby!

To join a conversation about this topic when you have finished the test, go to our Home page and click on Blog at the top right.

References

Agency for Healthcare Research and Quality (AHRQ). (2013). Educational Materials Enhance the Ability of New Parents to Understand and Cope with Infant Crying. AHRQ Healthcare Innovations Exchange. Retrieved July 2, 2013 from http://innovations.ahrq.gov/content.aspx?id=3281.

American Pregnancy Association. (2013). What Is Colic? Retrieved August 4, 2013 from http://americanpregnancy.org/firstyearoflife/colic.html.

Barr RG, et al. (2009). Do educational materials change knowledge and behavior about crying and shaken baby syndrome? A randomized controlled trial. CMAJ 180(7). Retrieved June 7, 2013 from http://www.cmaj.ca/content/180/7/727.full.

Centers for Disease Control and Prevention (CDC). (2012). A Journalist's Guide to Shaken Baby Syndrome: A Preventable Tragedy. A part of CDC's "Heads Up" Series. Retrieved March 3, 2013 from http://www.cdc.gov/Concussion/pdf/SBS_Media_Guide_508_optimized-a.pdf.

Centers for Disease Control and Prevention (CDC). (n.d). Preventing Shaken Baby Syndrome. A Guide for Health Departments and Community-Based Organizations. Retrieved March 21, 2013 from http://www.cdc.gov/concussion/pdf/preventing_sbs_508-a.pdf.

Chiesa A, Duhaime A-C. (2009). Abusive Head Trauma. *Pediatr Clin N Am* 56:317–31. Retrieved July 10, 2013 from http://www.researchgate.net/publication/24270525.

Child Welfare Information Gateway (CWIG). (2013). Preventing Child Maltreatment and Promoting Well-Being: A Network for Action 2013 Resource Guide. Retrieved July 4, 2013 from https://www.childwelfare.gov/preventing/preventionmonth/guide2013/.

Children's Bureau. (2011). Child Maltreatment 2011. U.S. Department of Health and Human Services. Retrieved May 21, 2013 from http://www.acf.hhs.gov/sites/default/files/cb/cm11.pdf.

Cook F, Bayer J, Le H, Mensah F, Cann W, Hiscock H. (2012). Baby Business: A randomized, controlled trial of a universal parenting program that aims to prevent early infant sleep and cry problems and associated parental depression. *BMC Pediatrics* 12:13. Retrieved March 3, 2013 from http://www.biomedcentral.com/1471-2431/12/13.

Department of Community Based Services (DCBS). (2012). Child Abuse and Neglect Annual Report of Fatalities and Near Fatalities. Retrieved April 6, 2013 from http://chfs.ky.gov/NR/rdonlyres/914D0E0B-AC66-421D-A49A-D37F2FC99BF7/0/ChildfatalityreportSFY2012final.pdf.

Guthkelch AN. (1971). Infantile Subdural Haematoma and Its Relationship to Whiplash Injuries. British Medical Journal 2:430–31. Retrieved April 16, 2013 from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1796151/pdf/brmedj02261-0032.pdf.

Jenny C. (2009). Preventing head trauma from abuse in infants. CMAJ 180(7). Retrieved June 7, 2013 from http://www.cmaj.ca/content/180/7/703.full.

Kempe CH, Silverman FN, Stelle BF, et al. (1985). The Battered Child Syndrome. *Child Abuse & Neglect* 9:143–54. Retrieved July 17, 2013 from www.kempe.org/download/The_Battered_Child_Syndrome_sm.pdf.

Kentucky.gov. (2013). Gov. Beshear signs child fatality external review panel bill into law. Retrieved April 6, 2013 from http://migration.kentucky.gov/Newsroom/governor/20130320panel.htm.

Kurth E, Spichiger E, Zemp Stutz E, et al. (2010). Crying babies, tired mothers—challenges of the postnatal hospital stay: An interpretive phenomenological study. *BMC Pregnancy and Childbirth* 10:21. Retrieved March 21, 2013 from http://www.biomedcentral.com/1471-2393/10/21.

Leventhal JM, Martin KD, Asnes AG. (2010). Fractures and Traumatic Brain Injuries: Abuse Versus Accidents in a U.S. Database of Hospitalized Children. *Pediatrics* 126(1):e104–e115. Retrieved July 11, 2013 from http://pediatrics.aappublications.org/content/126/1/e104.full.html#content-block.

Morbidity and Mortality Weekly Report (MMWR). (2010). Adverse Childhood Experiences Reported by Adults—Five States, 2009. Retrieved June 12, 2013 from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5949a1.htm.

Narang SK, Melville JD, Greeley CS, et al. (2013, July 1). A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome — Part II: An Examination of the Differential Diagnosis. Retrieved July 9, 2013 from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2288126.

Narang S. (2011). A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome. Houston Journal Health Law & Policy 11:505–633. Retrieved July 10, 2013 from http://www.law.uh.edu/hjhlp/Issues/Vol_113/Narang.pdf.

National Institute of Child Health and Human Development (NICHD). (2013). NICHD Research Perspectives, April 29, 2013. Retrieved May 21, 2013 from http://www.nichd.nih.gov/about/overview/directors_corner/podcasts/Pages/transcript_perspectives_042913.aspx.

New York State Office of Children and Family Services (NYSOCFS). (2011). Mandated Reporter Trainer's Resource Guide: Identifying and Reporting Child Abuse and Maltreatment/Neglect. Buffalo, NY: Research Foundation for SUNY/BSC/CDHS.

Parks SE, Annest JL, Hill HA, Karch DL. (2012). Pediatric Abusive Head Trauma: Recommended Definitions for Public Health Surveillance and Research. CDC, National Center for Injury Prevention and Control, Division of Violence Prevention. Retrieved March 20, 2013 from http://www.cdc.gov/violenceprevention/pdf/pedheadtrauma-a.pdf

Ramsey MD. (2006). A Nuts and Bolts Approach to Litigating the Shaken Baby or Shaken Impact Syndrome. Military Law Review 188. Retrieved May 30, 2013 from http://www.loc.gov/rr/frd/Military_Law/Military_Law_Review/pdf-files/188-summer-2006.pdf.

Sung V, Hiscock H, Tang M, et al. (2012). Probiotics to improve outcomes of colic in the community: Protocol for the Baby Biotics randomised, controlled trial. *BMC Pediatrics* 12:135. Retrieved June 1, 2013 from http://www.biomedcentral.com/1471-2431/12/135.

Watkins SA. (1990). The Mary Ellen myth: Correcting child welfare history. *Social Work* 35(6):500–503.

Post Test

Use the answer sheet following the test to record your answers.

1. Head and neck injuries inflicted on infants:

    a. Are usually caused by accidents.
    b. Are usually caused by falls.
    c. Can be caused by shaking for as little as 5 seconds.
    d. Are someshat inevitable.

2. Shaking an infant:

    a. Is an understandable reaction to a constantly crying baby.
    b. Is a type of child abuse that can cause head trauma.
    c. Is acceptable so long as the baby is not injured.
    d. Rarely causes any sort of injury to the infant.

3. Many terms exist for shaken baby syndrome, but for consistency the CDC currently recommends:

    a. Pediatric abusive head trauma.
    b. Shaken infant syndrome.
    c. Non-accidental trauma.
    d. Shaking impact syndrome.

4. One reason that shaking an infant can cause head trauma is because an infant's :

    a. Head is large in proportion to its body.
    b. Spine and skull are not hardened yet.
    c. Neck muscles and tendons are inflexible.
    d. Spinal column is not yet fully attached to the head.

5. Even though Ambroise Tardieu defined battered child syndrome in 1860, the president of the American Academy of Pediatrics finally introduced a set of criteria for defining child abuse more than:

    a. 20 years later.
    b. 50 years later.

c. 75 years later.

d. A century later.

6. The Child Abuse Prevention and Treatment Act (CAPTA) requires states receiving federal funds to:

a. Provide programs that identify and treat psychological maltreatment.

b. Incorporate specific minimum standards into their statutory definitions.

c. Define "child" as anyone under 21 years of age.

d. Define emancipated minors as children for purposes of identifying abuse.

7. In Kentucky law, abuse or neglect of a child may be the result of an action or a failure to act:

a. True

b. False

8. A husband/wife relationship is a legal ground in Kentucky for refusing to report an instance of suspected abuse.:

a. True.

b. False.

9. When making a report of child abuse in Kentucky, the identity of the reporter is always disclosed:

a. True

b. False

10. Who makes more than 60% of reports to protect a child from abuse?:

a. A person close to the perpetrator.

b. Friends and neighbors aware of a crying infant.

c. Family members or relatives.

d. Professionals for whom it is part of their job.

11. The most common age for a child to be shaken is:

a. Newborn, declining steadily after that.

b. After age 2, when the child is mobile and gets into more trouble.

c. Infants from 2 to 4 months of age.

d. Mostly after the age of 5.

12. In Kentucky, 91% of all cases of physical abuse resulting in serious injury or death:

    a. Were in children under the age of 4.
    b. Had perpetrators who were over the age of 30.
    c. The age of the victim was not a factor.
    d. Were more than 90% female.

13. Infant crying:

    a. Is usually worse in infants delivered by cesarean section.
    b. Generally lasts 1 to 2 years, then decreases.
    c. Is tolerated by the mother because of an increase in beneficial hormones after the birth.
    d. Increases in the first month after birth, peaks in the second month, and decreases thereafter.

14. The Wessell Criteria, also known as the Rule of Threes, identify colic as crying for more than:

    a. Three minutes per hour, three hours per day, for over three months.
    b. Three hours per day, three days per week, for over three weeks.
    c. Three feedings per day, three minutes per outburst, for over three weeks.
    d. Three months inconsolably.

15. A higher incidence of fatalities and near-fatalities occur when which three risk factors are present?:

    a. Parents over the age of 30, delivery by cesarean section, and substance abuse.
    b. Unmarried mother, preterm birth, and mental health issues.
    c. Substance abuse, domestic violence, and mental health issues.
    d. Home births, poor prenatal care, and parents under the age of 30.

16. One of the most common risk factors for a child's being abused is:

    a. Being a baby over 1 year of age.
    b. Having disabilities or chronic physical illness.
    c. Being a boy.

d. Being delivered in the breach position.

17. Perpetrators of child abuse are usually:

    a. Over the age of 60.
    b. Not the biological parents.
    c. Less intelligent than non-abusers.
    d. The child's biological parents.

18. The risk of child abuse is reduced when certain protective factors are present. These include:

    a. Nurturing parents with knowledge of parenting and child development.
    b. Parents with more education and at least a graduate degree.
    c. A rural home environment with lots of outdoor activities.
    d. Older children who are protective of their younger sibling.

19. Healthcare providers should be on the lookout for possible SBS/AHT injury when:

    a. The parent or caregiver appears to lack affect.
    b. The child is dirty or dressed in tattered clothing.
    c. The history is not plausible given the presenting signs and symptoms.
    d. The child cries during the entire visit.

20. The best indicators of SBS/AHT are:

    a. Fractures in long bones and developmental delays.
    b. Subdural hematoma, retinal hemorrhage, and cerebral edema.
    c. Sprains of the wrist or ankles with bruising.
    d. Excessive fussiness and rash on the face or neck.

21. The Period of PURPLE Crying program emphasizes all of the following except:

    a. Parents should use calming techniques with their infants.
    b. It is OK to put your baby down in a safe place and calm yourself.
    c. Never shake a baby.
    d. If your crying baby's face is purple, call 911.

22. Key points to reinforce when seeing parents of newborns and infants:

a. Crying is normal for an infant.

b. Crying peaks around 6 to 8 weeks then usually decreases.

c. Parents may not get enough sleep for a while but things will get better.

d. All of the above.

Answer Sheet

KY: Shaken Baby Syndrome

Name (Please print your name): ______________________________

Date: ______________

Passing score is 80%

1. _______
2. _______
3. _______
4. _______
5. _______
6. _______
7. _______
8. _______
9. _______
10. _______
11. _______
12. _______
13. _______
14. _______
15. _______
16. _______
17. _______
18. _______
19. _______
20. _______
21. _______
22. _______

Course Evaluation

Please use this scale for your course evaluation. Items with asterisks * are required.

- 5 = Strongly agree
- 4 = Agree
- 3 = Neutral
- 2 = Disagree
- 1 = Strongly disagree

* Upon completion of the course, I was able to:

a. Define pediatric abusive head injury and shaken baby syndrome.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

b. Comment on the evolution of society's recognition of child abuse and explain the Child Abuse Prevention and Treatment Act (CAPTA).

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

c. Explain the definitions of abuse, neglect, and physical injury in Kentucky law.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

d. Relate the child maltreatment reporting requirements under Kentucky law.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

e. Outline the incidence of abusive head trauma in the U.S. and in Kentucky.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

f. Describe the most common triggers and risk factors for shaking a baby and summarize factors that protect against pediatric abusive head trauma.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

g. Summarize the clinical presentation and diagnosis of shaken baby syndrome.

○ 5 ○ 4 ○ 3 ○ 2 ○ 1

h. Discuss intervention strategies and educational campaigns intended to prevent SBS.

5 4 3 2 1

i. Compare and contrast the primary schools of thought concerning the degree and type of force needed to cause the injuries seen in SBS.

5 4 3 2 1

* The author(s) are knowledgeable about the subject matter.

5 4 3 2 1

* The author(s) cited evidence that supported the material presented.

5 4 3 2 1

* This course contained no discriminatory or prejudicial language.

Yes No

* The course was free of commercial bias and product promotion.

Yes No

* As a result of what you have learned, do you intend to make any changes in your practice?

Yes No

If you answered Yes above, what changes do you intend to make? If you answered No, please explain why.

* Do you intend to return to ATrain for your ongoing CE needs?

- Yes, within the next 30 days.
- Yes, during my next renewal cycle.
- Maybe, not sure.
- No, I only needed this one course.

* Would you recommend ATrain Education to a friend, co-worker, or colleague?

- Yes, definitely.
- Possibly.
- No, not at this time.

* What is your overall satsfaction with this learning activity?

- 5 - 4 - 3 - 2 - 1

* Navigating the ATrain Education website was:

- Easy.
- Somewhat easy.
- Not at all easy.

* How long did it take you to complete this course, posttest, and course evaluation?

- 60 minutes (or more) per contact hour
- 50-59 minutes per contact hour
- 40-49 minutes per contact hour
- 30-39 minutes per contact hour
- Less than 30 minutes per contact hour

I heard about ATrain Education from:

- Government or Department of Health website.
- State board or professional association.
- Searching the Internet.
- A friend.
- An advertisement.
- I am a returning customer.

- My employer.
- Other
- Social Media (FB, Twitter, LinkedIn, etc)

Please let us know your age group to help us meet your professional needs.

- 18 to 30
- 31 to 45
- 46+

I completed this course on:

- My own or a friend's computer.
- A computer at work.
- A library computer.
- A tablet.
- A cellphone.
- A paper copy of the course.

Please enter your comments or suggestions here: ____

____

____

____

Registration Form

Please print and answer all of the following questions (* required).

* Name: ______________________________

* Email: ______________________________

* Address: ______________________________

* City: ______________________________ * State: ________ * Zip: ________

* Country: ______________________________

* Phone: ______________________________

* Professional Credentials/Designations:

____

Your name and credentials/designations will appear on your certificate.

* License Number and State: ______________________________

* Please email my certificate:

○ Yes ○ No

(If you request an email certificate we will not send a copy of the certificate by US Mail.)

Payment Options

You may pay by credit card or by check.
Fill out this section only if you are **paying by credit card.**
2.5 contact hours: $25

Credit card information

* Name: ______________________________

Address (if different from above): ______________________________

* City: ______________________________ * State: ________ * Zip: ________

* Card type:

○ Visa ○ Master Card ○ American Express ○ Discover

* Card number: ______________________________

* CVS#: ___________________

* Expiration date: ___________________