

facts on

Pediatric Abusive Head Trauma (Shaken Baby Syndrome)

What is pediatric abusive head trauma?

Pediatric abusive head trauma (AHT) is a term used to describe the cerebral, spinal, and cranial injuries seen in infants and young children as a result of blunt impact, violent shaking, strangulation, or a combination of these. The blunt impact can be a result of direct blows to the head or striking the head against a surface. Shaken baby syndrome is a form of AHT. Using the broader term of AHT accounts for the different causes of this type of injury, which include shaking. Infants under the age of one are most at risk of serious injuries.

Estimates of the incidence of AHT vary, but all are likely underestimates of the total number of cases due to missed diagnosis, under-reporting, and infants with less severe forms of injury not being brought to medical attention. The Canadian Paediatric Surveillance Program reported the incidence of AHT to be 14.1 per 100,000 for infants under the age of 1 between 2005 and 2008. American estimates of incidence typically range from 20 to 30 cases per 100,000 children under the age of 1.

What causes AHT?

When an infant or young child is forcefully shaken or hit against something, the head and neck move back and forth and side to side uncontrollably. This movement results in the infant's brain moving back and forth inside the skull, which can cause blood vessels and nerves to rupture and brain tissue to tear. The brain may also swell, resulting in pressure and increased injury to the brain. The same motion that happens in the brain also happens in the

eyes, resulting in bleeding and possible damage to the infant's vision. When the head is struck against an object, additional injuries may be seen (e.g., lacerations, bruises, fractures). Often though, there are no obvious external signs of injury. It is important to note that these types of injuries cannot be caused by activities such as play, an accidental fall from a couch, or a resuscitation attempt.

What are signs of AHT?

While no single injury can be used to diagnose AHT, doctors may look for the following:

- Bleeding in and around the brain (intracranial hemorrhages)
- Bleeding into the retinas of the eyes (retinal hemorrhages)
- Swelling of the brain and other brain injury
- Skull, rib, and long bone fractures
- Neck and spinal cord damage
- Bruising around the head, neck, or chest

The initial signs and symptoms of AHT may be mistaken for a virus or other minor illness. These signs include decreased interaction, poor feeding/sucking, vomiting, lethargy, decreased muscle tone, extreme irritability, and difficulty breathing. More severe symptoms include a bulging soft spot on the head, larger than normal looking forehead, rigidity, seizures, and loss of consciousness. A conclusion as to whether or not the injury is AHT requires a full multidisciplinary evaluation, based on the available clinical and historical information.

For More Information

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What are outcomes of AHT?

AHT results in death in approximately 20% of cases, and the majority of those who survive suffer serious, long-term health consequences. The outcomes are affected by the duration, force, and number of shaking/impact episodes. The following outcomes are associated with survivors of AHT:

- Partial or total blindness
- Hearing loss
- Developmental delays
- Learning disabilities, including problems with memory and attention
- Physical disabilities
- Cerebral palsy
- Paralysis
- Seizures

Infants are most at risk of serious injury from AHT because of their fragile and still-developing brains, their proportionately larger and heavier heads, their under-developed neck muscles, and the large size and strength difference between the perpetrators and victims.

What are risk factors for AHT?

Risk factors for AHT can be separated into three categories:

- Infant factors (crying pattern, separation anxiety, disabilities, prematurity)
- Situational factors (stressful situations, family isolation, lack of support, poverty)
- Caregiver factors (lack of knowledge about normal crying patterns and the risk of shaking, unrealistic expectations about child development, frustration intolerance, substance use)

Anything that increases caregiver stress and/or decreases the caregiver's ability to cope can increase the likelihood of AHT. This is why AHT occurs across all socioeconomic, cultural, religious, and ethnic groups. Victims of AHT are typically under the age of 6 months and are more often male than female. Perpetrators are most often males. Infant crying, particularly inconsolable and frequent crying, has been repeatedly identified as the main trigger for AHT.

How can AHT be prevented?

Because crying is such a significant trigger for AHT, service providers can help to reduce AHT by reminding caregivers that crying is normal (even long bouts of inconsolable crying), it will get better, and that there are steps they can take to try to comfort their babies. Crying typically increases at around two weeks of age, peaks at two to three months, and declines by five months. Caregivers should be taught this, and should be reminded that shaking, throwing, hitting, or hurting a baby is never the right way to deal with crying.

Caregivers can be educated about normal child development and healthy ways to calm a crying baby (e.g., gentle rocking, pacifiers, singing softly, taking a ride in a stroller, driving in the car safely strapped in a car seat, warm bath). Caregivers can also be taught to recognize and respond to their own stress and frustration, and about healthy ways to calm themselves (e.g., call someone for help and support, take deep breaths, listen to music). For more information for parents, please refer to *When Your Baby Can't Stop Crying* (www.skprevention.ca, 4-902).

Research indicates that many infants with AHT have a history or clinical evidence of previous maltreatment and/or violence. Therefore, it is important that all service providers working with families with young children are educated about the signs of AHT. Early detection is vital for preventing repeat episodes and further damage to the child. It is also important that service providers are knowledgeable about their legal duty to report any reasonable suspicion that a child's physical or mental health or welfare has been, or may be, impacted by abuse or neglect to a local Ministry of Social Services Child Protection Office, First Nations Child and Family Services Agency, or the police. Refer to *Saskatchewan's Child Abuse Protocol 2017* for more information.

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