

# Pediatric Abusive Head Trauma

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## KEYWORDS

• Abusive head trauma • Shaken baby syndrome • Child maltreatment • Child abuse

## KEY POINTS

- PAHT is a significant cause of morbidity and mortality in the United States.
- Many infants and young children die from PAHT injuries and others sustain life-altering neurologic damage.
- Healthcare providers need to increase their knowledge base and level of suspicion when confronted with common vague presenting symptoms, such as vomiting, irritability, and feeding difficulties.
- Early recognition and appropriate action may significantly improve outcomes for victims of PAHT.
- Any provider who has reason to suspect abuse has a legal and moral obligation to take the steps necessary to protect the child.
- Comprehensive community-based programs that teach caregivers the dangers of shaking and strategies for coping with infant crying may hold the best hope for reducing the incidence of PAHT.

## INTRODUCTION

Child maltreatment may be reaching epidemic proportions. In the United States, a child abuse report is made every 10 seconds. Statistics indicate more than 3.3 million reports, involving approximately 6 million children, are made annually resulting in an estimated annual cost of \$120 billion.<sup>1</sup> Furthermore, with more than five deaths daily, the United States leads all industrialized nations in pediatric abuse-related deaths.<sup>2,3</sup> Among all forms of physical child abuse, head trauma is the leading cause of death and disability.<sup>4</sup> Abuse is the third leading cause of head injury among children in the United States and is the leading cause of serious head injuries in the first year of life.<sup>5</sup> It is crucial that nurses be proficient in the recognition of children who are at risk for this type of abuse and that they be able to identify early signs and symptoms in those who have already been victimized. Pediatric abusive head trauma (PAHT) fatalities are believed by many experts to be 100% preventable through early

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recognition of risk factors, early identification and prompt intervention, and educational preventative programs. Nurses play a critical role in the development and implementation of prevention programs.

### WHAT IS PAHT?

Abusive head trauma refers to any intentionally inflicted injury to the head or neck, including cranial, cerebral, and spinal injuries. The mechanism of injury may be blunt force trauma, shaking, throwing, dropping, slamming, violent pulling, or any combination of these.<sup>6,7</sup> The term “shaken baby syndrome” is well recognized and commonly used to describe inflicted head trauma in small children. Recognizing the limitations of this term, specifically that all inflicted head trauma is not the result of shaking, the American Academy of Pediatrics currently recommends that the term “abusive head trauma” instead be used.<sup>7</sup> The term abusive head trauma includes shaken baby syndrome, shaken impact syndrome, and all other forms of inflicted head trauma.

### EPIDEMIOLOGY

As with all forms of child maltreatment, the actual incidence of PAHT is difficult to quantify. Available statistics only partially represent the actual number of cases. This is caused in part by the criminal nature of the act and the failure of healthcare providers to recognize the syndrome and report it appropriately. Further complicating the issue has been the lack of uniform definitions and terminology. In April 2012, the Centers for Disease Control and Prevention addressed this problem by issuing recommended definitions for public health surveillance and research related to PAHT.<sup>5</sup>

Currently available information identifies PAHT as the leading cause of death from child abuse in the United States.<sup>8</sup> Between 1000 and 1500 known cases occur annually. Of these approximately 20% of victims sustain minor injuries, whereas 50% result in life-altering neurologic damage. Thirty percent of victims die as a result of their injuries.<sup>9</sup> PAHT accounts for 64% of all head injuries in infants younger than 12 months and 95% of the serious intracranial injuries in infants younger than 12 months. Approximately 10% of all child abuse deaths are from PAHT. The highest incidence occurs between the ages of 3 and 8 months of age. Although uncommon after the age of 2 years, cases have been reported up to 5 years of age.<sup>10,11</sup>

### MECHANISMS OF INJURY

Pediatric nurses fully understand that “children are not small adults.” This is particularly true when considering head trauma. Infants are especially vulnerable to the effects of head trauma for several reasons:

1. Relative to their bodies an infant’s head is large, heavy, and unstable. By the age of 2 years, a child’s brain has grown to 75% of its full adult size and weight.<sup>8,12,13</sup>
2. The musculature of the infant’s neck is weak and underdeveloped making the head unstable and more susceptible to the movement associated with acceleration-deceleration forces.<sup>8,12,13</sup>
3. The infant’s brain has a water content of 88% (compared with the 77% in adult brains). This coupled with incomplete myelination results in brain tissue that is softer and more vulnerable to acceleration-deceleration and shear injury.<sup>8,12,13</sup>
4. The thin, pliable infant skull and shallow subarachnoid space allows for more effective transfer of forces to the brain.<sup>8,12,13</sup>
5. Greater cerebral blood volume maximizes the potential for bleeding and swelling in the brain.<sup>8,12,13</sup>

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