


Joint Statement

on Shaken Baby  
Syndrome

Background Paper

**Developed by the Saskatchewan Institute  
on Prevention of Handicaps, 2001**

**Funded by Health Canada, 2001**



Shaking a baby is dangerous and can result in Shaken Baby Syndrome, a preventable tragedy. Shaken Baby Syndrome can occur at any age but is most commonly found in infants less than one year of age. It is a condition that occurs when an infant or young child is shaken violently, with or without associated impact trauma to the head, usually by a parent or a caregiver. Violently shaking a baby or child is assault – a form of child abuse and a criminal offence. Each year in Canada at least six infants are killed (Statistics Canada, 1999) and many more are permanently injured (King & MacKay, 2000) by this tragic form of child abuse.


## **Terminology**

Shaken Baby Syndrome is a serious and clearly defined form of child abuse (American Academy of Pediatrics, 2001). It refers to a group of clinical findings in infants and young children that are a consequence of violent shaking (Lancon et al., 1998). Injuries that characterize Shaken Baby Syndrome are intracranial haemorrhage (bleeding in and around the brain); retina haemorrhage (bleeding in the retina of the eye); and fractures at the ends of the long bones and/or ribs (David, 1999). Impact trauma may produce additional injuries such as bruises, lacerations or fractures. There may be no external evidence of cranial trauma (American Academy of Pediatrics, 1993; Haviland & Russell, 1997; Atwal et al., 1998; Lancon et al., 1998). Studies confirm that most, but not all, shaken babies have evidence of impact injuries as well (Gilliland, 1998; David, 1999).

First identified by Caffey (1972) as whiplash Shaken Baby Syndrome, the condition is also referred to as shaken impact syndrome (Bruce & Zimmerman, 1989), abusive head trauma (Starling et al., 1995), whiplash shaken infant syndrome (Bonnier et al., 1995), shaking-impact syndrome (Duhaime et al., 1998), non-accidental head trauma (Giles & Nelson, 1998), and non-accidental head injury (Barlow & Minns, 1999). There is some controversy about the necessity for the infant's head to strike a surface in order to produce the severe brain injuries (Duhaime et al., 1987; Krous & Byard, 1999). However, it is accepted by most researchers that shaking alone can cause the brain damage (Carty & Ratcliffe, 1995; Gilliland & Folberg, 1996; Atwal et al., 1998; Barlow et al., 1999).

## **Mechanism of Injury**

Shaken Baby Syndrome involves a mechanism of violent shaking of an infant by an abuser (usually an adult). Studies suggest that the actual shaking event can be quite brief. It may occur only once, with almost immediate fatal consequences, or occur in a pattern of repetitive abuse spanning several days, weeks or months (Lancon et al., 1998).



Violent shaking may be combined with impact of the child's head against a stationary object or with the impact of a moving object against the child's head. The infant's head also undergoes rotational, acceleration and deceleration forces as well as whiplashing during shaking (Carty & Ratcliffe, 1995; Massagli et al., 1996; David, 1999). In some cases, whiplash injury to the upper spine may occur. Other secondary injuries such as violent twisting or pulling of the extremities, intentional burns or beating may be inflicted by an abuser in conjunction with a shaking event (Lancon et al., 1998).

The severity of the shaking force required to produce Shaken Baby Syndrome is such that it cannot occur in any normal activity such as play or the activities of daily living, or in a resuscitation attempt. The act of shaking that results in injury to the child is so violent that untrained observers would recognize it as dangerous to the child (American Academy of Pediatrics, 1993; Carty & Ratcliffe, 1995).

## **Causes of Injury**

When an infant is shaken, the person doing the shaking usually grabs the infant around the chest, arms or shoulders and shakes back-and-forth, causing the infant's head to whip forcibly backward and forward. Infants are especially vulnerable to brain injuries because of their relatively large heads and weak neck muscles (Swenson & Levitt, 1997).

During a shaking episode, the infant's brain rotates inside the skull. The bridging veins, which drain blood and are the only attachments between the brain and skull around the brain, are stretched and may become torn. Blood then flows to create a subdural haematoma, which is a signpost that shaking has occurred. Nerves in the brain may be damaged or destroyed leading to brain dysfunction that can be manifested in a number of ways. Seizures can occur, there may be brain swelling within hours of the injury, and the results are permanent brain damage or brain death within days (Swenson & Levitt, 1997; Reese & Kirshner, 1998; Driver, 1999).

The cause of the eye injuries is unclear, but likely involves violent movement of the orbital contents during the shaking (Levin, 2000). Similarly, violent shaking with twisting and pulling of the long bones of the limbs results in fractures of their endplates. Ribs are fractured as the chest is squeezed and moved back and forth during the shaking.

## **Characteristics of the Syndrome**

Infants affected by Shaken Baby Syndrome present with a broad range of symptoms, including apnea, vomiting, irritability, listlessness, lethargy, seizures and poor feeding. Subtle bruises, swelling of the brain, anemia, hypothermia, and rib or long bone fractures may also be present. Infants who have been shaken may have symptoms ranging from those similar to a viral illness, such as irritability or lethargy and vomiting, to seizures, unconsciousness with interrupted breathing or death. Attending physicians rarely know whether the child has a history of being shaken. Lack of external evidence of trauma increases the difficulty of diagnosis (Swenson & Levitt, 1997).



The signs of Shaken Baby Syndrome include (Chiocca, 1995):

1. retinal haemorrhages
2. new or healing fractures of the long bones and/or ribs
3. intracranial haemorrhages found by brain imaging.

There may or not be external signs of trauma, depending on the severity of impact injury, if any.

Babies who are shaken may be brought to medical attention with no history of injury or a vague or incompatible account provided by the caregiver that is not consistent with the physical findings.

Diagnostic tools include computed tomography (CT), magnetic resonance imaging (MRI) and a skeletal survey. The eyes should be assessed for retinal haemorrhages (American Academy of Pediatrics, 1993; Swenson & Levitt, 1997; Lancon et al., 1998).

## **Multidisciplinary Approach**

The medical evaluation of an infant with suspected Shaken Baby Syndrome requires a multidisciplinary team approach incorporating expertise in Shaken Baby Syndrome within the specialties of critical care, neurosurgery, neurology, ophthalmology, orthopaedics, pathology, radiology and other allied health professions. Not all of these professionals may be needed in any one particular case.

Professionals involved in handling infant deaths should be trained and cooperate in a multidisciplinary approach so that deaths from Shaken Baby Syndrome can be distinguished from sudden infant death syndrome (American Academy of Pediatrics, 1994). There is evidence that some cases of Shaken Baby Syndrome have been mistakenly designated as sudden infant death syndrome (Bass et al., 1986; Byard & Krous, 1999).

The identification, evaluation, investigation, management and prevention of Shaken Baby Syndrome require a multidisciplinary approach that respects the jurisdictional responsibilities of each discipline. There is a need for a shared commitment that includes professionals from the disciplines associated with health, child welfare, police and social services, courts and education as well as the community at large (Ludwig, 1981; Kovitz et al., 1984; Hochstadt & Harwicke, 1985).

The legal implications of Shaken Baby Syndrome involve child welfare and criminal investigations. These investigations will determine whether or not it is safe for children to remain in their caregivers' care and if an individual is charged with assault or homicide (Brown & Minns, 1993; Luerssen et al., 1993; Lancon et al., 1998).



## Outcomes

Overall, the severity of injury and outcomes from abusive head trauma in infants are worse than in any other type of childhood head injury (Goldstein et al., 1993; DiScala et al., 2000). The outcome for infants who are shaken violently can range from no apparent effects to permanent disabling brain damage, including developmental delay, seizures and/or paralysis, blindness and even death. Survivors may have significant delayed effects of neurological injury, resulting in a range of impairments seen over the course of the child's life, including cognitive deficits and behavioural problems (Chiocca, 1995).

Recent Canadian data on children hospitalized for Shaken Baby Syndrome show that 19% died, 22% were well at discharge, and 59% had neurological or visual impairment and/or other health effects (King & MacKay, 2000).

Ongoing evaluation of survivors of Shaken Baby Syndrome is important. Significant neurological disability may be detected several years after the injury. A follow-up study of 14 children who were hospitalized due to shaking found that seven were severely disabled, two were moderately disabled, and three had repeated grades in school, required tutoring or had behavioural problems (Duhaime et al., 1998). In another series of 13 children, one died and six remained severely and permanently disabled from the time of the shaking. The six other children apparently recovered fully after the shaking. However, all but one of these children became disabled six months to five years later. Delayed effects included psychomotor delays, especially in language, adaptability and social behaviour (Bonnier et al., 1995).


## Effects on Community

It is likely that most survivors of Shaken Baby Syndrome will require special services for the duration of their lives. These services may include health and mental health care, speech and language, infant stimulation, and rehabilitation. Additional services may be needed such as residential placement, special education and employment advocacy (Zeneah & Larrieu, 1998). Long-term effects are experienced by birth, adoptive and foster families of children affected by Shaken Baby Syndrome. Non-abusing parents may require additional support from health, social and legal services (D'Lugoff & Baker, 1998).

## Current Knowledge

### *Number of Children Affected by Shaken Baby Syndrome*

At the present time, there is no definitive answer to the question of how many babies are affected by Shaken Baby Syndrome in Canada. A recent report from the Canadian Collaborative Study on Shaken Impact Syndrome indicates that, from 1988 to 1998, 364 children under five years of age were hospitalized for Shaken Baby Syndrome (King & MacKay, 2000). The data consist of the most severe cases of Shaken Baby Syndrome, those that are seen in paediatric hospitals, but many minor cases are unrecorded in the data (Driver, 1999).



The incidence of Shaken Baby Syndrome may be severely underestimated due to missed diagnosis and underreporting. A recent study in the United States revealed that the diagnosis of Shaken Baby Syndrome was missed in over 30% of the cases of abusive head trauma in infants (Jenny et al., 1999).

### ***Factors Associated with Shaken Baby Syndrome***

Why are babies shaken? At times, a person may react violently and shake a baby impulsively when exhausted or frustrated by the baby's crying. Other situations that trigger a shaking incident are toileting and feeding difficulties. In some cases, there is evidence of careless disregard for the child's safety and repeated shaking episodes and other non-accidental injuries suggesting an intent by the caregiver to severely injure, if not kill the infant (American Academy of Pediatrics, 1993).

It is believed that Shaken Baby Syndrome occurs in all cultures and socio-economic groups (Brown & Minns, 1993; Kivlin, 1999). Some risk factors associated with child abuse, including Shaken Baby Syndrome, are (Swenson & Levitt, 1997):


1. parental isolation
2. violence in the home
3. substance abuse
4. psychiatric difficulties
5. inadequate knowledge of child development
6. lack of attachment to the child

Shaken Baby Syndrome may also occur in families with no apparent risk factors.

The Canadian Collaborative Study reports that infants who have been shaken are most often males (56%) and have a median age of 4.6 months (range: 7 days to 58 months) (King & MacKay, 2000). In 34% of the cases, the person responsible was not identified in the medical record. For the 64% where the person was known, biological fathers (52%), male partners of biological mothers (20%), female babysitters (15%) and biological mothers (12.5%) were identified or suspected as responsible for the abuse (King & MacKay, 2000).

### **Prevention**

As a form of child abuse, Shaken Baby Syndrome is a complex issue, requiring intersectoral approaches to prevention and intervention. Communities can develop programs to educate parents, prospective parents and caregivers about the developmental stages and needs of infants. Interventions with families at risk involve the participation of multiple agencies and groups, including those from health, social services, education and community-based organizations. Where families have been affected by Shaken Baby Syndrome, services must be provided to assist them with the ongoing needs of the injured child and for protection of other children in the family.



**Primary prevention** begins with teaching all new parents, potential parents, caregivers and the general public about strategies to cope with crying in babies and difficult behaviour in toddlers. Parents and caregivers must be educated about normal child development and the dangers of shaking babies (Butler, 1995). Educational resources should provide information on Shaken Baby Syndrome.

**Secondary prevention** interventions should be provided to families considered to be at risk for abuse because of unrealistic expectations of their children or lack of knowledge regarding normal child development (Showers, 1991; Butler, 1995). Programs providing home visits by nurses have been shown to be effective in reducing child abuse in high-risk families (American Academy of Pediatrics, 1993; Olds et al., 1997; MacMillan, 1998; Olds et al., 1997, 1999). Child care providers should receive appropriate training in the care of young infants and should be regularly supervised and evaluated.

### ***The Message: Never Shake a Baby***

Strategies must be put in place to educate the entire population, including adults and youth, about the dangers of losing control when caring for an infant. Key messages should explain that the most common trigger causing an individual to shake a baby is the baby's crying; that physical discipline should have no place in caring for babies properly (Bruce & Zimmerman, 1989); that there are alternative strategies for dealing with exhaustion and feelings of frustration toward a baby; and that caution must be taken in selecting alternate caregivers. Targeted approaches to prevention interventions should be provided to families considered to be at risk for abuse. The focus of prevention messages must be that it is dangerous to shake a baby. Messages must emphasize: Never shake a baby.

These messages can be delivered through professional organizations, public education campaigns, parenting education programs, parent support networks, school curricula and other methods such as public service announcements.

## Sources

- American Academy of Pediatrics. Committee on Child Abuse and Neglect. Shaken baby syndrome: Rotational cranial injuries -- technical report. *Pediatr* 2001;108:206-210.
- American Academy of Pediatrics. Committee on Child Abuse and Neglect. Distinguishing Sudden Infant Death Syndrome from child abuse fatalities. *Pediatr* 1994;94:124-126.
- American Academy of Pediatrics. Committee on Child Abuse and Neglect. Shaken Baby Syndrome: Inflicted cerebral trauma (RE9227). *Pediatr* 1993;92:872-875.
- Atwal GS, Ruddy GN, Carter N, Green MA. Bruising in non-accidental head injured children; a retrospective study of the prevalence, distribution and pathological associations in 24 cases. *Forensic Sci* 1998;96:215-230.
- Banaschak S, Brinkmann B. The role of clinical forensic medicine in cases of sexual child abuse. *Forensic Sci Int* 1999;99:85-91.
- Barlow KM, Minns RA. The relation between intracranial pressure and outcome in non-accidental head injury. *Dev Med Child Neurol* 1999;41:220-225.
- Barlow KM, Gibson RJ, McPhillips M, Minns RA. Magnetic resonance imaging in non-accidental head injury. *Acta Paediatr* 1999;88:734-740.
- Bass M, Kravath RE, Glass L. Death-scene investigation in sudden infant death. *New Engl J Med* 1986;315:100-105.
- Beckman CR, Groetzinger LL. Treating sexual assault victims. A protocol for health professionals. *Physician Assist* 1990; 14:128-130.
- Bonnier C, Nassogne MC, Evrard P. Outcome and prognosis of whiplash shaken infant syndrome; late consequences after a symptom-free interval. *Dev Med Child Neurol* 1995;37:943-956.
- Brewster AL, Nelson JP, Hymel KP et al. Victim, perpetrator, family, and incident characteristics of 32 infant maltreatment deaths in the United States Air Force. *Child Abuse Negl* 1998;22:91-101.
- Brown JK, Minns RA. Non-accidental head injury, with particular reference to whiplash shaking injury and medico-legal aspects. *Dev Med Child Neurol* 1993;35:849-869.
- Bruce DA, Zimmerman RA. Shaken impact syndrome. *Pediatr Ann* 1989;18:482-494.
- Butler GL. Shaken baby syndrome. *J Psychosoc Nurs* 1995;33:47-50.
- Byard RW, Krous HF. Suffocation, shaking or sudden infant death syndrome: Can we tell the difference? *J Pediatr Child Health* 1999;35:432-433.
- Caffey J. On the theory and practice of shaking infants. *Am J Dis Child* 1972;124:161-169.
- Canadian Medical Association. Infants dead on arrival. *Clin Practice Guidelines, CPG Infobase*, <http://www.cma.ca/cpgs>, 1999.
- Carty H, Ratcliffe J. The shaken infant syndrome: Parents and other carers need to know of its dangers. *Br Med J* 1995;310:344-345.
- Chabrol B, Decarie JC, Fortin G. The role of cranial MRI in identifying patients suffering from child abuse and presenting with unexplained neurological findings. *Child Abuse Negl* 1999;23:217-228.
- Chabrol B, Fortin G, Bernard-Bonnin AC et al. [Management and prevention of abuse in Quebec: A program of sociolegal paediatrics at the Sainte-Justine Hospital in Montreal]. *Arch Pediatr* 1998;5:1366-1370. [Article in French] 20.
- Chadwick DL, Kirschner RH, Reese RM et al. Shaken baby syndrome—A forensic pediatric response. *Pediatr* 1998;101:321-323.
- Chiocca EM. Shaken baby syndrome: Anursing perspective. *Pediatr Nurs* 1995;21:33-38.
- Collins KA, Nichols CA. A decade of pediatric homicide: A retrospective study at the Medical University of South Carolina. *Am J Forensic Med Pathol* 1999;20:169-172.
- Committee on Child Abuse and Neglect, 1993-1994. Shaken baby syndrome: Inflicted cerebral trauma. *Del Med J* 1997;69:365-370.



- Conway EE Jr. Nonaccidental head injury in infants: "the shaken baby syndrome revisited." *Pediatr Ann* 1998;27:677–690.
- Coody D, Brown M, Montgomery D et al. Shaken baby syndrome: Identification and prevention for nurse practitioners. *J Pediatr Health Care* 1994;8:50–56.
- Crocker D. Innovative models for rural child protection teams. *Child Abuse Negl* 1996;20:205–211.
- David TJ. Shaken baby (shaken impact) syndrome: Non-accidental head injury in infancy. *J Royal Soc Med* 1999;92:556–561.
- DiScala CM, Sege R, Li G, Reece RM. Child abuse and unintentional injuries: A 10-year retrospective. *Arch Pediatr Adolesc Med* 2000;154:16–22.
- D'Lugoff MI, Baker DJ. Case study: Shaken baby syndrome—One disorder with two victims. *Public Health Nurs* 1998;15:243–249.
- Driver D. Too many shaken babies in Canada, doc says. *The Medical Post*, September 14, 1999:60.
- Duhaime AC, Christian C, Moss E, Seidl T. Long-term outcome in infants with the shaking-impact syndrome. *Pediatr Neurosurg* 1998;24:292–298.
- Duhaime AC, Christian CW, Rorke LB, Zimmerman RA. Nonaccidental head injury in infants—The "shaken baby syndrome." *New Engl J Med* 1998;338:1822–1829.
- Duhaime AC, Gennarelli TA, Bruce DA et al. The shaken baby syndrome. A clinical, pathological, and biomechanical study. *J Neurosurg* 1987;66:409–415.
- Fitzpatrick D. Shaken baby syndrome fatalities in the United States. *National Information, Support and Referral Service on Shaken Baby Syndrome* 1998;Autumn.
- Giles EE, Nelson MD. Cerebral complications of nonaccidental head injury in childhood. *Pediatr Neurol* 1998;19:119–128.
- Gilliland MG, Folberg R. Shaken babies—Some have no impact injuries. *J Forensic Sci* 1996;41:114–116.
- Gilliland MG. Interval duration between injury and severe symptoms in nonaccidental head trauma in infants and young children. *J Forensic Sci* 1998;43:723–725.
- Goldstein B, Kelly MM, Bruton D, Cox C. Inflicted versus accidental head injury in critically injured children. *Crit Care Med* 1993;21:1328–1332.
- Grey TC. Shaken baby syndrome: Medical controversies and their role in establishing "reasonable doubt." *National Information, Support, and Referral Service on Shaken Baby Syndrome* 1998;Spring:4–5.
- Haviland J, Russell RI. Outcome after severe non-accidental head injury. *Arch Dis Child* 1997;77:504–507.
- Health Risk Resources International, Newcastle-upon-Tyne. Best practice guidelines. *Br J Nurs* 1999;8:293–294.
- Herman-Giddens ME, Brown G, Verviest S et al. Underascertainment of child abuse mortality in the United States. *JAMA* 1999;282(5):463–467.
- Hochstadt NJ, Harwicke NJ. How effective is the multidisciplinary approach? A follow-up study. *Child Abuse Negl* 1985;9:365–372.
- Holloway M, Bye AM, Moran AK. Non-accidental head injury in children. *Med J Aust* 1994;160:786–789.
- Jayawant S, Rawlinson A, Gibbon F et al. Subdural haemorrhages in infants: Population based study. *Br Med J* 1998;317(7172):1558–1561.
- Jenny C, Hymel KP, Ritzen A, Reinert SE, Hay TC. Analysis of missed cases of abusive head trauma. *JAMA* 1999;28:621–626.
- King J, MacKay M. A 10-year retrospective review of shaken baby syndrome in Canada. *Pediatr Res* 2000;47:202A.
- Kivlin JD. A 12-year ophthalmologic experience with the shaken baby syndrome at a regional children's hospital. *Tr Am Ophth Soc* 1999;XCVII:545–581.

- Kovitz KE, Dougan P, Riese R, Brummitt JR. Multidisciplinary team functioning. *Child Abuse Negl* 1984;8:353–360.
- Krous HF, RW Byard. Shaken infant syndrome: Selected controversies. *Pediatr Dev Pathol* 1999;2:497–498.
- Lancon JA, Haines DE, Parent AD. Anatomy of the shaken baby syndrome. *Anat Rec* 1998;253:13–18.
- Lazoritz S, Baldwin S, Kini N. The Whiplash Shaken Infant Syndrome: Has Caffey's syndrome changed or have we changed his syndrome? *Child Abuse Negl* 1997;21:1009–1014.
- Leventhal JM. The challenges of recognizing child abuse: Seeing is believing. *JAMA* 1999;281:657–659.
- Levin AV. Retinal haemorrhages and child abuse. Chapter 10 (pp. 151–219) in *Recent Advances in Paediatrics*. Edinburgh: Churchill Livingstone. 2000.
- Ludwig S. A multidisciplinary approach to child abuse. *Nurs Clin North Am* 1981; 16:161–165.
- Luerssen TG, Bruce DA, Humphreys RP. Position statement on identifying the infant with nonaccidental central nervous system injury (the whiplash-shake syndrome). The American Society of Pediatric Neurosurgeons. *Pediatr Neurosurg* 1993;19:170.
- MacMillan HL. Child abuse: A community problem. *Can Med Assoc J* 1998;158:1301–1302.
- Massagli TL, Michaud LJ, Rivara FP. Association between injury indices and outcome after severe traumatic brain injury in children. *Arch Phys Med Rehabil* 1996;77:125–132.
- Mills M. Funduscopic lesions associated with mortality in shaken baby syndrome. *JAAPOS* 1998;2:67–71.
- Morton R, Benton S, Bower E et al. [Letter] Multidisciplinary appraisal of the British Institute for Brain Injured Children, Somerset, UK. *Dev Med Child Neurol* 1999;41:211–212.
- Nashelsky MB, Dix JD. The time interval between lethal infant shaking and onset of symptoms. A review of the shaken baby syndrome literature. *Am J Forensic Med Pathol* 1995;16:154–157.
- Olds DL et al. Long-term effects of home visitation on maternal life course and child abuse and neglect: Fifteen-year follow-up of a randomized trial. *JAMA* 1997;278:637–643.
- Olds DL et al. Prenatal and infancy home visitation by nurses: Recent findings. *The Future of Children* 1999;9:44–65.
- Onyskiw JE, Harrison MJ, Spady D, McConnan L. Formative evaluation of a collaborative community-based child abuse prevention project. *Child Abuse Negl* 1999;23:1069–1081.
- Parrish R. The proof is in the details: Investigation and prosecution of shaken baby cases. *National Information, Support and Referral Service on Shaken Baby Syndrome* 1998;Winter:4–5.
- Plunkett J. Shaken baby syndrome and the death of Matthew Eappen: A forensic pathologist's response. *Am J Forensic Med Pathol* 1999;20:17–21.
- Reese RM, Kirschner RH. Shaken baby syndrome/shaken impact syndrome. *National Information, Support and Referral Service on Shaken Baby Syndrome* 1998;Summer:4–5.
- Sadler DW. The value of a thorough protocol in the investigation of sudden infant deaths. *J Clin Pathol* 1998;51:689–694.
- Sanders R, Jackson S, Thomas N. The balance of prevention, investigation, and treatment in the management of child protection services. *Child Abuse Negl* 1996;20:899–906.
- Shannon P, Smith CR, Deck J et al. Axonal injury and the neuropathology of shaken baby syndrome. *Acta Neuropathol* 1998;95:625–631.
- Showers J. "Don't shake the baby": The effectiveness of a prevention program. *Child Abuse Negl* 1992;16:11–18.
- Showers J. Behaviour management cards as a method of anticipatory guidance for parents. *Child Care, Health and Development* 1989;15:401–415.

Showers J. Child behaviour management cards: Prevention tools for teens. *Child Abuse Negl* 1991;15:313–316.

Showers J. *The National Conference on Shaken Baby Syndrome: A Medical, Legal, and Prevention Challenge*. Executive Summary. National Association of Children's Hospitals and Related Institutions. 1998.

Spaide RF, Swengel RM, Scharre DW, Mein CE. Shaken baby syndrome. *Am Fam Physician* 1990;41:1145–1152.

Starling SP, Holden JR, Jenny C. Abusive head trauma: The relationship of perpetrators to their victims. *Pediatr* 1995;95:259–262.

Statistics Canada. Homicide statistics. *The Daily* Thursday, October 7, 1999.

Swenson MS, Levitt C. Shaken baby syndrome: Diagnosis and prevention. *Minnesota Med* 1997;80:41–44.

*The Lancet*. Editorial. 1998;352:9125.

Zeneah CH, Larrieu JA. Intensive intervention for maltreated infants and toddlers in foster care. *Child Adolesc Psychiatr Clin N Am* 1998;7:357–371.