

# Shaken Baby Syndrome

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Non-accidental head trauma in infants is the leading cause of infant death from injury. Clinical features that suggest head trauma (also known as shaken baby syndrome or shaken impact syndrome) include the triad consisting of retinal hemorrhage, subdural, and/or subarachnoid hemorrhage in an infant with little signs of external trauma. Abusive head injuries are among the most common causes of serious and lethal injuries in children. These injuries may result from impact or shaking or a combination of these mechanisms. These mechanisms cause the child's head to undergo acceleration/deceleration movements, which may create inertial movement of the brain within the cranial compartment. **Key words:** *child abuse, head trauma, infant, retinal hemorrhage, shaken baby syndrome, shaken impact syndrome*

Abusive head injuries among infants (shaken baby syndrome; SBS) represent a devastating form of child abuse. Shaking an infant or child can cause damage ranging from mild and temporary to severe and permanent. It is estimated that 10% to 12% of all infant deaths from child abuse are a result of SBS. There are approximately 50 000 cases of SBS in the United States yearly, and statistically, 1 of 4 cases results in death.<sup>1</sup> Approximately, 7% to 30% of shaken infants die, 30% to 50% have significant cognitive or neurological deficits, and up to 30% will experience no long-term effects.<sup>2</sup> A range of injuries may result from SBS such as permanent brain injury, paralysis, blindness, seizures, cerebral palsy, and delay in normal development, behavioral difficulties, or permanent vegetative state. The American Academy of Pediatrics considers SBS victims to be most often aged 2 years or younger, but note that SBS occurs in children as old as age 5 years.<sup>3,4</sup> The clinical evaluation of an infant includes a complete history, physical examination, laboratory, and diagnostic studies. Infant crying is a precipitating factor in at least some of the cases of SBS. This article focuses on the history, critical risk factors, assessment, and physical findings asso-

ciated with SBS. Strategies for intervention and prevention of SBS, such as neonatal discharge information and parental skills to cope with both crying and the stress that it provokes, are also reviewed.

## HISTORY

The signs associated with an episode of repetitive and violent shaking were first described in 1946 by Dr John Caffey who described children with long bone fractures and intracranial bleeding as victims of trauma.<sup>5,6</sup> Until the 1960s, child abuse was not considered a medical problem in the United States, and physician involvement in child abuse cases was limited. In the 1960s, doctors began reporting on clinical signs and radiographic findings of child abuse that resulted from intentional trauma.<sup>7</sup> In 1972, Caffey named a syndrome "parent-infant-stress syndrome" or "battered baby syndrome" when an infant presented with radiological and physical findings associated with child abuse and the "whiplash-shaking and jerking" of infants.<sup>8</sup> Head injuries resulting from "whiplash" shaking have been linked to the biochemical processes involved in severe forms of head trauma. The head of an infant comprises more of the infant's body weight and the neck muscles are weaker than those in older children, rendering infants more susceptible to whiplash injury.<sup>9,10</sup> Infants lack head control, so they cannot resist or minimize the forces of injury. Sudden shaking is thought to cause shearing of the cerebral blood vessels, leading

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to subdural hematoma. In addition to head injuries, the presentation of long bone fractures and retinal hemorrhages without noticeable outward signs of trauma has been named SBS.<sup>11-13</sup>

Premature infants and those with disabilities are at higher risk for abuse, as are those of low socioeconomic status and those who have young parents. It is difficult to determine the true mechanism of injury in SBS because most injuries are not witnessed. Affected infants are rarely shaken only once; they are usually subjected to repeated shaking episodes.<sup>14</sup> Shaking the infant is often an attempt to stop crying and the force of the shaking correlates with the perpetrator's frustration.<sup>15</sup>

## PHYSICAL FINDINGS

Recognizing SBS can be challenging. Frequently, inaccurate reporting or even cover-up stories by parents and caregivers can mislead healthcare providers. Knowing the minor, and sometimes misleading, signs and symptoms can help avoid missing a case of SBS. Although the act of shaking an infant may result in major clinical signs that lead to high suspicion and rapid treatment, the signs can also be so minor that they are mistaken for less life-threatening childhood illnesses. Infants and toddlers with nonspecific symptoms, such as poor feeding, failure to thrive, vomiting, fever, listlessness, lethargy, unexplained seizures, bulging or full fontanelles, hypothermia, or irritability, should be examined for head trauma so as not to miss the possible diagnosis of SBS.<sup>16</sup>

## ASSESSMENT

Orbital tissue injury is more common in SBS than accidental head trauma without orbital fracture. Orbital tissue injury is due to the unique acceleration/deceleration forces of this type of abusive head injury.<sup>17,18</sup> Inaccurate or incomplete assessment of SBS can have serious and deadly consequences for the victim. Further damage can continue to occur (ie, retinal hemorrhage and intracranial hemorrhage or edema) after the shaking has ended and must be identified immediately to achieve the best potential outcome.<sup>19</sup> All documentation must be complete, detailed, and objective to optimize future medical care of the victim and the potential prosecution of the perpetrator.

The most obvious diagnosis that should be considered in the differential of diagnoses is accidental trauma. Infants who have been victims of motor vehicle crashes or falls can have subdural hem-

orrhages; however, falls are a rare cause of severe brain injuries.<sup>20,21</sup> Premature infants being evaluated for retinopathy of prematurity have occasionally exhibited retinal hemorrhages.<sup>22,23</sup> Further workup must be done to rule out a diagnosis of SBS in these patients. Infants, especially premature neonates, who have had shunted hydrocephalus can sustain subdural or subarachnoid hemorrhage with mild trauma.<sup>24</sup> Accidental head injuries usually occur from trauma associated with significant force, for example, in a motor vehicle accident.<sup>25</sup>

Signs of SBS may vary from mild to severe and may or may not be easily identified clinically as head trauma. An infant or a child who has been a victim of this syndrome can present in many ways. Medical attention may be sought because of fever, irritability, lethargy, and decreased intake in mild cases or for difficulty breathing or apnea, seizures, loss of consciousness, or unresponsiveness in more severe cases. Since an accurate history is difficult to obtain, a head-to-toe physical examination should be performed including palpation of the fontanelles, measurement of head circumference, and observation for signs of trauma.<sup>11,25</sup> The hallmark of SBS is the absence of or minimal evidence of external trauma to the head, face, and neck but serious intracranial or intraocular bleeding.<sup>26-28</sup>

Non-accidental injuries should be carefully considered for any infant younger than 1 year who presents with an intracranial hemorrhage after an alleged minor fall. Shaken Baby Syndrome does not result from the use of an infant swing, bouncing an infant on the knee, or routine playing. It reflects the forces that accompany the perpetrator's rage, anger, and loss of control during the shaking episode.<sup>29,30</sup> Studies have shown that generally the average short fall in the home is extremely unlikely to produce either subdural or retinal hemorrhage, although focal injuries such as skull fractures and epidural hemorrhage may be seen.<sup>25,31</sup> Experts in many scientific fields have investigated whether such apparently innocent practices as tossing a baby into the air and other playful maneuvers might cause brain damage by a similar shaking mechanism. Currently, it is generally accepted that such playful practices do not result in injuries to the young child's brain. The type of shaking that is thought to result in significant brain injury involves holding the child by the thorax or an extremity and violently shaking the child back and forth, causing the head to forcefully whiplash forward and backward with repeated accelerations and decelerations in each direction.<sup>32</sup>

Because infants have minimally developed anatomy, they are at increased risk for permanent injury. The combination of a heavy head, weak neck muscles, soft

and rapidly growing brain, thin skull wall, and lack of mobility and control of the head and neck make infants extremely vulnerable to injury from shaking.<sup>33</sup> Since an infant's brain has higher water content and less myelination than an adult brain, it is more gelatinous and is easily compressed and distorted within the skull during a shaking episode.<sup>34</sup>

The most astonishing evidence of damage is revealed through radiological imaging.<sup>35</sup> Computed tomography scan is one of the tools used in diagnosing SBS. Both computed tomography and magnetic resonance imaging typically identify subarachnoid hemorrhage, subdural hemorrhage, retinal hemorrhages, diffuse brain injury, and brain swelling. These injuries are due to the whiplash motion, with sudden acceleration and deceleration of the head, causing diffuse injury. Brain damage occurs from the resultant biochemical forces, swelling, ischemia, and altered vascular autoregulation.<sup>28,36–38</sup>

As a result of this whiplash motion, a shaken baby can show signs of partial or total vision loss because of retinal tearing, hearing impairments, seizure disorders, cerebral palsy, sucking and swallowing disorders, developmental disabilities, autism, cognitive impairments, behavior problems, and even a permanent vegetative state.<sup>2</sup> Layers of the retina slide across each other, sheering the retinal vessels and resulting in hemorrhage.<sup>17,18,23</sup> Retinal hemorrhages are typically bilateral but can be unilateral. Ophthalmologic examination is warranted in all patients with questionable histories, seizures, or lethargy because retinal hemorrhages are a classic finding of SBS.<sup>11</sup> In severe cases of shaking, the infant usually loses consciousness, as the central nervous system rapidly shuts down and eventually fails.<sup>39</sup>

The long-term outcome of SBS survivors typically depends on the severity of symptoms at the time of presentation. Sequelae from infant shaking can range from no adverse effects to death; however, the majority of survivors will have significant morbidity and major neurological handicaps. Infants presenting with apnea, seizures, and coma are more likely to have developmental delays, seizures, and static encephalopathy. The American Academy of Pediatrics Committee on Child Abuse and Neglect reported that of infants who were comatose when initially examined, 60% died or had profound mental retardation, spastic quadriplegia, or other severe motor problems.<sup>3</sup> Shaken baby syndrome fatalities are usually the result of uncontrollable brain swelling.<sup>11</sup> Additional physical findings that healthcare professionals may see are abdominal injuries and rib fractures due to the infant's upper body being grasped while violently shaken. Laboratory studies

may reveal mild-to-moderate anemia, mild-to-moderate changes in coagulation, high amylase levels signifying pancreatic damage, and elevated transaminase levels indicating trauma to the liver.<sup>27</sup>

## RISK FACTORS

Critical analysis of risk factors of both victims and perpetrators can strengthen intervention strategies.

### Risks related to infants/victims

The incidence of SBS correlates with the incidence of early infant crying.<sup>37–41</sup> Inconsolable crying is the most common precipitating factor noted in shaking victims.<sup>42–44</sup> Risk factors related to SBS victims include age less than 1 year, most often less than 6 months of age and often increased crying at younger ages.<sup>34</sup> Male infants are at higher risk than females possibly because of unrealistic developmental and behavioral achievements expected of males. Additional risk factors include colic, inconsolable crying, premature birth, low birth weight, disability and/or special needs, multiples, and stepchildren.

### Risks related to parents/caregivers/perpetrators

Usually incessant crying and the perpetrator's desire to quiet the infant lead to SBS. Recognizing that the crying ceases after the child has been shaken, the perpetrator is likely to repeat the behavior. The risk of repetitive shaking and further abuse of the infant and/or siblings is significant.<sup>45–47</sup> The severity of the shaking has been attributed to the perpetrator's tension and frustration levels.<sup>26</sup>

Shaken baby syndrome generally occurs when a caretaker becomes frustrated, overwhelmed, or angry and is often triggered by inconsolable crying. Males, especially biological fathers, mothers' boyfriends, and stepfathers are the most frequent perpetrators. Other perpetrators of SBS include babysitters or nonparent caregivers, stepparents, grandparents, and other relatives.<sup>2,8</sup>

The most common risk factor for perpetrators, most frequently parents, is the inability to cope with stress, the environment, and poor impulse control.<sup>48</sup> Additional risk factors are adolescent age, unrealistic child-rearing expectations, rigid attitudes and impulsivity, feelings of inadequacy and isolation, depression, substance abuse, and negative childhood experiences, including personal history of abuse and neglect.<sup>49,50</sup> Many of these risk factors are similar to the feelings parents experience after the birth of a premature infant. A lack of understanding of premature infant development

may lead to additional frustration, stress, decreased tolerance, and resentment. Prematurity, a prolonged stay in the neonatal intensive care unit (NICU), and the presence of residual medical complications place preterm infants at a higher risk of abuse than their full-term counterparts.<sup>51</sup> Children with disabilities are abused more often than other infants. Since premature infants have a higher rate of disabilities than full-term infants, their risk is even greater.<sup>39</sup> Infants born to mothers who suffer from depression or consume alcohol during pregnancy may also be at greater risk. These infants may be less responsive to caregiver interaction and more likely to have attachment disorders and difficulty bonding with caregivers during the first few months of life. These factors affect at-risk caregivers because they frequently lead to incessant infant crying that can trigger stress leading to shaking.<sup>2,8</sup> Parents/caregivers often consider shaking a safer method of discipline than spanking.<sup>2</sup> Environmental factors such as low socioeconomic status, social issues such as poverty, unemployment, low education, unsafe neighborhood, poor prenatal care, single marital status, frequent moves, and lack of social support carry additional risks for shaking a baby.<sup>11</sup>

It stands to reason, that given the separation that occurs with a premature birth and decreased attachment, the premature infant is at greater risk for SBS. Differences in a preterm infant's behavior and a mismatch with parental expectations may further contribute to the infant's vulnerability.<sup>52,53</sup> Parents' experiences surrounding the premature birth and infants' different behavior patterns may delay successful parenting and influence parent-infant interactions.<sup>52,53</sup> After an infant is discharged from the NICU, caregivers are often required to not only parent but also provide nursing and medical care tasks, while coping with chronic illness. In addition, neurologically impaired infants tend to display more screaming and crying which can test the parents' coping mechanisms, and contribute to increased incidence of child abuse.

Evidence strongly supports the association between infant crying and SBS.<sup>37,38,41,42</sup> The results of a previous study on 3345 infants show that parents report taking a number of negative actions to stop infants from crying. In the study, 3.35% of the parents of 6-month-old infants reported having shaken their baby at least once to stop their crying. For parents of 1-month-old infants, the percentage was 1.10%. Of the parents of 6-month-old infants, 5.60% reported having shaken their infant to stop their crying or smothered or slapped their infant. These percentages may be conservative because of parental underreporting, which is likely even though an anonymous and confidential questionnaire was utilized. In-

terestingly, the worries of parents about their infant's crying and their judging this crying excessive are much more predictive of risk than the actual amount of crying, measured by Wessel's criteria for its duration.<sup>44</sup>

## INTERVENTION

Because SBS is often difficult to detect and visible injuries are not always present, healthcare professionals need to maintain an index of suspicion when any high-risk indicators are evident (Table 1). Frequently, no external sign of injury is apparent. Primary care providers are in an optimal position to evaluate risk factors and educate families and other healthcare providers on SBS.<sup>9,11</sup> A thorough history and accurate documentation are as important as physical assessment in determining the extent of injuries. In addition, healthcare professionals need to determine when the infant's mental or physical status changes occurred, what events led up to the changes, and who was present. A detailed timeline can be helpful.

Immediate questioning of the person who brought the infant in for evaluation should focus on possible life-threatening injuries. The history provided by the caregiver is important but accuracy is sometimes clouded or distorted as described above, necessitating careful examination and documentation of suspicious findings of trauma or external abuse. Perpetrators may try to blame injuries on tossing, rough play, or accidental falls, but the physical findings of these activities are highly inconsistent with those of SBS. Any inconsistencies should be further investigated. With the combination of physical examination and accurate history, appropriate actions can be taken to promptly treat the child's injuries and stop further progression of injury, as well

**Table 1.** Common signs of shaken baby syndrome

Lethargy/decreased muscle tone
Extreme irritability
Decreased appetite, poor feeding, or vomiting for no apparent reason
No smiling or vocalization
Poor sucking or swallowing
Rigidity or posturing
Difficulty breathing
Seizures
Head or forehead appears larger than usual or soft-spot on head appears to be bulging
Inability to lift head
Inability of eyes to focus or track movement or unequal size of pupils

**Table 2.** Ways to soothe a crying baby<sup>a</sup>

Meet basic needs
Feed the baby
Burp the baby
Change the diaper
Make sure clothing isn't too tight
Make sure baby isn't too hot, or too cold
Then
Take the baby for a walk outside in a stroller or for a ride in the car seat
Hold the baby against your chest and gently massage the baby
Rock, walk, or dance with the baby
Be patient; take a deep breath and count to 10
Call a friend or relative that you can trust to take over for a while, then get away, get some rest, take care of yourself
Offer a pacifier
Lower any surrounding noise and lights
Offer the baby a noisy toy; shake or rattle the toy
Hold the baby and breathe slowly and calmly; the baby may feel your calmness and become quiet
Sing or talk to the baby using soothing tones
Record a sound, like a vacuum cleaner, or hair dryer

<sup>a</sup>www.aboutshakenbaby.com

as determine the appropriate authorities to notify (eg, local law enforcement, child protective services).<sup>54</sup>

Interventions focusing on improving parent coping skills should be especially targeted at parents who report excessive infant crying. Improving parent coping skills may be beneficial both for the prevention of SBS and for the prevention of abuse in later childhood.

Parents of preterm infants, who have witnessed their infant being “stimulated” during multiple apneic events, may perceive shaking to be a similar form of stimulation and emulate it after discharge. This is another reason why SBS should be part of the neonatal nurse’s knowledge base and a context for discussing care, stress, and coping with parents in the NICU (Table 2).<sup>29</sup>

## PREVENTION

Unfortunately, head trauma caused by shaking is a common occurrence in infants and young children. The proper treatment and safety of these children can be enhanced by the nurse’s ability to recognize feature characteristic of this syndrome. If abuse is suspected, appropriate providers, child-protective, and law-enforcement agencies should be notified immediately. All states have child-protection ordinances requiring healthcare professionals to report cases of suspected abuse to the local or state child protective service agency.<sup>50,55</sup>

Health professionals in the NICU can play a critical role in preventing SBS. Parents of preterm infants grieve the loss of their “normal” baby. Preterm infants’ behaviors differ from those of full-term newborns, and these differences can affect their relationship with caregivers. Preterm infants generally are less organized, become over-stimulated easily, display less alert times, are harder to console, and are less responsive to normal caregiver interactions. Both the parents’ experiences surrounding the preterm birth and the infants’ different behavior patterns may delay successful parenting and influence later parent-infant interactions.<sup>53</sup> Neonatal nurses can assess parent grief reactions, discuss, and demonstrate infant behaviors when parents visit throughout the NICU stay, and educate parents regarding infant crying and behaviors, methods of consoling, and coping strategies as part of discharge preparation.

After hospital discharge, preterm infants may display atypical behaviors. Difficult temperaments, erratic sleep patterns, difficulty in self-consoling, and feeding problems are common. Parents, who have already been challenged by the premature birth, must acquire the skills needed to care for their infant often while managing their own residual disappointment, frustration, and anger. An increased awareness of the escalated risk factors for SBS and knowledge about preventative strategies that can be initiated in the hospital are essential for healthcare providers in the NICU.<sup>29,56</sup> NICU nurses should educate parents about injury risks, infant characteristics and vulnerabilities including crying, and coping, and support strategies. Discharge teaching should also focus on temperament and its effects on infant behavior. Since premature infants also have a higher rate of disabilities than full-term infants, extra attention should be given to discharge teaching of parents of high-risk neonates.

The federal Child Abuse Prevention and Treatment Act was adopted and implemented in 1974. Funds from this act have assisted communities in improving practices in the prevention and treatment of child abuse and neglect. In 2001, information related to SBS was given to all new parents in New York before discharge of a newborn. In addition, follow-up phone calls 6 to 7 months after discharge were obtained to evaluate the retention of SBS information by parents. Parents indicated that the information provided was helpful and a significant decrease (60%) in the incidence of SBS occurred in the New York areas studied.<sup>57</sup> The best educational programs are directed at prevention of physical abuse, such as the Healthy Families America program. This national effort is aimed at developing programs to help parents of young infants and children better understand child development as well as

**Table 3.** The period of PURPLE crying

Peak of crying during the second month (full-term) and decreasing thereafter  
 Unexpected crying that comes and goes for no apparent reason  
 Resists soothing efforts by caregivers  
 Pain-like face (with or without pain)  
 Long-lasting crying for 30–40 minutes or longer  
 Evening crying

support for these parents.<sup>58</sup> Educational programs that focus on parents and other caregivers directly affect SBS at a primary level. Specifically, education should target nurses who care for premature and high-risk neonates and their families.<sup>42,57,59</sup>

The association between crying and SBS provides important areas of focus for prevention. Prevention should focus on the effect of crying on parents and caregivers, and on skills to better cope with both the crying and the stress it provokes. Focusing on decreasing the crying is probably less adequate because the judgment of the crying appears to be more important than its actual duration. Additional interventions should be targeted at parents who report excessive infant crying.<sup>41</sup> Educational programs targeting health-care professionals can teach prevention strategies and how to identify the signs of repeated abuse.

Strategies to reduce shaken infants include providing family/caregiver education and healthy coping strategies, especially for NICU infants/families.<sup>60</sup> Prevention strategies include SBS education by healthcare professionals during routine office visits, prenatal visits, prenatal classes, and before hospital discharge of a neonate from the term unit and the NICU. Other educational opportunities include babysitting classes, community-wide educational seminars, and routine health-related school courses.<sup>11,33,55</sup>

Parent education about normal and preterm development can help develop realistic expectations of their infant. Parents should be encouraged to verbalize feelings of inadequacy and helplessness. Anticipa-

**Table 4.** Educational opportunities regarding shaken baby syndrome<sup>a</sup>

Period of PURPLE crying  
 SBS 101: The basics  
 School-based curriculum  
 Hospital education for maternity services  
 Dads 101

<sup>a</sup>NCSB on-line store @ [www.dontshake.com](http://www.dontshake.com).

**Table 5.** Resources/Web sites related to shaken baby syndrome education, prevention, and family support

National Center on Shaken Baby Syndrome, 2955 Harrison Boulevard, Suite 102, Ogden, UT 84403, <http://www.dontshake.com>.  
 The Shaken Baby Alliance, PO Box 150734, Fort Worth, TX 76108, <http://www.shakenbaby.com>.  
 US Department of Health and Human Services, <http://www.hhs.gov>.  
 American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, IL 60007-1098, <http://www.aap.org>.  
 Prevent Child Abuse America, 200 South Michigan Ave, 17th Floor, Chicago, IL 60604-2404, <http://www.preventchildabuse.org>.  
 Healthy Families America, [www.healthyfamiliesamerica.org](http://www.healthyfamiliesamerica.org).  
 NCSB on-line store @ [www.dontshake.com](http://www.dontshake.com).  
[www.aboutshakenbaby.com](http://www.aboutshakenbaby.com).

tory guidance about normal emotions and frustrations should be provided and parents should be reassured that it is common for these feelings to escalate after discharge.

Educate parents that it is normal for infants to cry for regular periods each day, and this behavior does not reflect negatively on their parenting abilities. Concrete strategies for coping with an infant who is irritable and hard to console should be addressed such as swaddling, positioning, and movement (Table 2). Devising an emergency plan for situations when parents can no longer tolerate crying is helpful so that they can take appropriate action before anger and frustration get out of control.<sup>52,59</sup>

In 1989, the largest and best-known SBS education and prevention program was targeted at new mothers in six Franklin County, Ohio hospitals. The campaign was titled "Don't Shake the Baby." An information packet was provided to the new mother when birth certificate information was collected, and the mother was encouraged to read the material.<sup>60</sup> The packet was provided at the time of the birth certificate information because this may be a time when parents are most focused on the infant's well-being and will retain information most effectively. The mothers were then asked to complete a response postcard aimed at assessing the effectiveness of the teaching program. According to monthly statistics provided by participating hospitals, a total of 15 708 births occurred during the project period. Response postcards were received from 3293 parents, representing a 21% return rate. In response to a multiple-choice question, 98% of

respondents selected the correct response, “shaking can cause brain damage or kill a baby.”<sup>60</sup> A new campaign titled “Never Shake a Baby” utilizes brochures and cards describing strategies to manage crying infants and increasing parent frustration, informational videotapes about SBS, television and radio public service announcements, and posters of different sizes for offices, classrooms, and billboards.<sup>61</sup>

The National Center on Shaken Baby Syndrome (NCSBS) reported that educational programs have focused on reaching new and future parents,<sup>62,63</sup> for example, the NCSBS has an effective program called “Dads 101,” which is offered to military personnel, men in prison, youth detention centers, and halfway houses, and in conjunction with hospital prenatal care programs.<sup>62</sup> *Elijah’s Story*, a documentary about a child who was shaken to death by his father is also offered by NCSBS.<sup>62</sup>

Another form of intervention includes printed information in an easily available and user-friendly reference for new parents who may be disturbed by infant crying patterns. NICU nurses have a great opportunity to assess parents’ interactions with infants and an even greater opportunity to educate parents on techniques to decrease stress and improve coping skills. The letters in the acronym PURPLE describe behavioral characteristics through which normal babies’ progress and that parents and caregivers often report as frustrating<sup>59</sup> (Table 3). The period of PURPLE crying program brochures/DVD facilitate understanding of infant crying patterns and the potential effects on the parent or caregiver. The goal of this program is to decrease parent frustration and stress that can lead to the infant shaking.

Policies and practices that minimize or eliminate parent-infant separation in the NICU are critical be-

cause infants who require intensive care are often hospitalized for weeks and months. Examples to encourage attachment and bonding, and participation in care include open visitation policies, kangaroo care, and inclusion in rounds and shift change.<sup>64</sup> Discussions with parents should include the normalcy of infant crying and strategies for coping when an infant cries frequently and is hard to console (Table 4).

Resources and Web sites related to SBS education, prevention, and family support should be provided to families (Table 5). Home visiting programs for both assessing high-risk families and educating them have been very successful. One study completed in New York revealed that visitation from a healthcare provider resulted in fewer mandated reports to child protective services and improved parent-child relationships.<sup>59</sup> Another home visitation study in Memphis showed fewer health problems associated with injury of children when a healthcare professional visited the family home.<sup>37</sup> The researchers also concluded that a coordinated, hospital-based, parent education program, targeting parents of all newborn infants, can reduce significantly the incidence of abusive head injuries among infants and children younger than 36 months.

## SUMMARY

It is important for neonatal and pediatric healthcare professionals involved in the care of infants, especially high-risk infants, to identify at-risk families, provide education, and train healthcare professionals about SBS. SBS is preventable. Involvement in prevention is essential to reduce the incidence, morbidity, and mortality of this devastating syndrome. Providing prevention and education to parents early can prevent, and reduce, the number of victims of SBS.

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