Objectives and posttest can be found on page 84.

Evaluation and Management of Apparent Life-Threatening Events in Infants

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Apparent life-threatening events (ALTEs) are frightening to caregivers and clinicians alike. This article provides a comprehensive review of the causes, management, and consequences of ALTEs. The information provided was collected from an extensive literature review using the search terms ALTE, sudden infant death syndrome, and apnea. There is a wide array of contributing factors to ALTE syndrome and sequalae for both infants and caregivers of infants experiencing an ALTE.

Color changes and the appearance of an infant not breathing are frightening to parents and health care providers alike. Apparent life-threatening event (ALTE) is a term used to categorize the unexpected presentation of symptoms that include a combination of change in color and/or muscle tone, coughing, gagging, or apnea in an infant. The National Institutes of Health (NIH) defined apnea of infancy as an unexplainable 20-second or longer event of cessation of breathing or a shorter respiratory pause, along with bradycardia, cyanosis, pallor, and/or marked hypotonia (NIH, 1986). Prior to the release of the NIH's coining of the term "ALTE," other terms, such as "near-miss sudden infant death syndrome" or "aborted crib death" were used. The hallmark of an ALTE is a parental report of a frightening, sudden display of the symptoms and a quick recovery with or without bystander intervention, such as stimulation or resuscitation. For example, parents may report needing to do cardiopulmonary resuscitation on their infant, yet when they arrive at the emergency department, a completely normal-appearing infant is observed by the clinician. Parents may perceive that their reports are not believed by health care providers. The purpose of this article is to provide nurses with the necessary background to recognize and manage an ALTE and infant apnea across the continuum of care. A specific emphasis on the psychosocial, emotional, and behavioral implications of the parents witnessing an ALTE in their infant will be addressed.

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Epidemiology and Risk Factors

The incidence of ALTEs in children is approximately 6% of all infants, typically affecting those under the age of one year, usually under 10 weeks old, and of male gender. The history may reveal that the infant has feeding difficulty, such as feeding with cough, lack of coordination, and/or rapid feeding. Risk factors include second-hand smoke exposure, premature birth, exposure to pertussis, respiratory synctial virus, or recent general anesthesia (Carroll, 2004; Davies & Gupta, 2002; McGovern & Smith, 2004). Premature infants are especially susceptible to ALTEs, with causes such as aspiration with feedings, anemia, hypoglycemia, post-hemorrhagic hydrocephalus, cardiac arrhythmias, respiratory synctial virus, bordetella pertussis, sepsis, gastroesophageal and/or laryngeal esophageal reflux disease with or without aspiration, and seizures (Batton, 2004; McGovern & Smith, 2004).

Most descriptive data associated with ALTEs are collected from emergency department admissions, and thus, are not representative of those cases that go unevaluated. For example, infants who appear to fully recover from an ALTE may never visit the emergency department (McGovern & Smith, 2004). Some infants may experience repeated events that are fully managed by caregivers in the home setting. The relationship between ALTEs and sudden infant death syndrome (SIDS) is controversial. With less than 7% of patients diagnosed with SIDS having a previous hospital record of an ALTE (NIH, 1986), it is believed that not all ALTE victims are at risk for SIDS, but that there may be a subpopulation of infants who experience an ALTE who are at risk for SIDS, suggesting they are not part of the same entity. Like SIDS, ALTEs occur more in the winter months and are associated with second-hand smoke exposure (Edner, Wennborg, Alm, & Lagercrantz, 2007). Infant positioning has been implicated as a contributing factor (American Academy of Pediatrics [AAP], 2007).

Etiology

Conditions implicated in the causes of ALTE syndrome may be idiopathic, digestive, neurologic, respiratory, cardiac, and endocrine or metabolic (Khan, 2003). ALTEs that occur in infants over the age of two months should be considered to be due to serious causes during evaluation (Davies & Gupta, 2002), but generally about half of all cases result in being labeled idiopathic, whereas the remaining half have identifiable causes and possible interventions to reduce events (Brooks, 1992). Identifiable triggers of ALTEs are

Table 1.
Examples of Triggers of Apnea Events

Central	Obstructive
Oral suctioning	Aspiration due to consumption
Cold applied to face	Aspiration due to reflux contents
Vasovagal reflex	Breath-holding spell
Hypoglycemia	Swallowing disorders (eosinophilic esophagitis)
Electrolyte abnormality (magnesium and calcium)	Laryngotracheomalacia
Apnea of infancy and prematurity	Esophageal atresia
Seizures	Impaction of consumed contents
Anemia	Inflammation due to esophagitis
Central nervous system tumor	Collapse and lack of coordination due to hypotonia
Hydrocephalus	Excessive gag reflex
Brain stem structural defects (Budd-Chiari syndrome/ malformation)	Gastric volvulus
	Intussusception
Cardiac dysrhythmia (QTc prolongation, Wolff-Parkinson-White syndrome)	Adenoid and vocal cord abnormalities
	Breath-holding spell
Congenital heart disease	Airway anomaly
Cardiomyopathy, myocarditis	Enlarged adenoids/tonsils
Central hypoventilation	Bronchospasm and mucus production due to reactive airway disease/asthma
Inborn metabolic errors	
Infectious (respiratory synctial virus, pertussis, meningitis, sepsis)	Diaphramatic fatigue (post-excessive crying spells or physical exertion)
Urinary tract infection	Seizures
	Infectious (respiratory synctial virus, pertussis, mycoplasma, croup, pneumonia)
	Child abuse (suffocation)
	Hypotonia
	Münchausen by proxy

listed in Table 1. Half of all cases of ALTEs with identifiable causes are associated with gastrointestinal disorders, followed by 30% representing neurologic dysfunction. Another 20% of cases are due to respiratory dysfunction and 15% due to cardiac disease, metabolic abnormalities, and child abuse syndromes. A small proportion of cases are due to medication reactions and/or allergy and/or anaphylaxis (Davies & Gupta, 2002). Swallowing disorders resulting from eosinophilic esophagitis, a condition closely related to food allergies that results in dysphagia, and food impaction may also be a cause. More than one problem may contribute to an ALTE rendering some infants to repetitive events. In addition, it may be difficult for the clinician to identify a single cause of an ALTE. Thus, ALTEs represent a syndrome and not a disease entity requiring a comprehensive assessment for contributing factors.

Table 2.
Nursing Documentation of Observed Events

Patient activity immediately preceding event, during the ALTE and in the recovery period should be observed.
Activity: Awake, asleep, position, feeding
Context: Crib, infant seat, car seat, blankets, and pillows
Disposition: Coryza, fever, hypothermia, dysmorphic appearance, loss of consciousness, hypotonia/hypertonia
Behaviors: Coughing, gagging, gasping, crying, choking, vomiting, eyes rolling in head, foreign body or milk or blood in mouth or nose, lethargy, diaphoresis, eye deviation, convulsions
Respiratory effort: None, shallow, gasping, increased, accessory muscle use, nasal flaring, retractions, chest wall rise
Breath sounds: Stridor, wheeze
Color: Pallor, red, purple, blue
Location of color changes: Peripheral, whole body, circumoral, tongue and palate, symmetric
Movement and tone: Rigid, tonic-clonic, decreased, floppy, limp, jerking
Intervention: Gentle stimulation, blowing air or oxygen in face, vigorous stimulation, rebreathing mask with 100% oxygen, rescue breathing, cardiopulmonary resuscitation
Duration: Length of time until recovery, length of time of resuscitation effort

Assessment of the Infant

Emergency Department Care

Assessment of the infant experiencing an ALTE incorporates observation of the signs of an ALTE as well as possible contributing events (see Table 2). A detailed history and full physical examination on an unclothed infant, including an otoscopic examination for hemotympanum and a fundoscopic examination for retinal hemorrhage, should be obtained (Pitetti et al., 2002). Essential history questions include those that can differentiate central from obstructive apnea, such as asking if the apnea was effortless (central) or associated

with coughing, choking, gasping, or stridor (Fu & Moon, 2007). Diagnostic testing at the entry point of care includes 12-lead electrocardiography; blood gas analysis; and chest radiography, with an awareness that rib fractures are not associated with chest compressions in infants (Batton, 2004); comprehensive labs, including a complete blood count with differential to evaluate for anemia and bacterial causes, serum electrolytes, serum ammonia levels present with inborn errors of metabolism, and urinalysis; and nasal washing for respiratory synctial virus and cultures for *Bordetella pertussis* (Shah & Sharieff, 2007; Warren, Biagioli, Hamilton, & Smith, 2007).

However, the European Society for the Study and Prevention of Infant Death Consensus Statement recommends the addition of echocardiography, electroencephalography to evaluate for seizures, evaluation for reflux, polysonography, tilt-table testing, toxicology, and video surveillance (Kahn, 2003). Other testing is indicated if the causes are not determined according to the hypothesized etiology, including barium-contrast upper gastrointestinal series and gastric pH probe to evaluate acid-reflux, and head-computed tomography and full skeletal radiography of the extremities to evaluate for deliberate harm (Warren et al., 2007). Warren et al. (2007) report evidence-based diagnostic tests using expert consensus and case series studies with limited sample sizes. According to some studies, the use of lactate levels and radioisotope milk scans may be useful (Davies & Gupta, 2002; Warren et al., 2007). Yet, other tests may be indicated depending upon the hypothesized etiology, such as MRI to evaluate for evidence of malformations of the brain stem and a PHOX2B (DNA-associated protein) genetic mutation testing that may predict congenital central hypoventilation syndrome (formerly known as Ondine's Curse) (Trochet et al., 2005).

Although there is controversy as to whether or not all patients presenting to the emergency department should be admitted (Claudius & Keens, 2007), to not deviate from the standard of care (Goldberg, Schwartz, & Picard, 2007), there would need to be clear and convincing evidence that the infant only experienced a breath-holding spell. Of the 3% of infants experiencing breath-holding spells, 15% to 25% present under six months of age and are marked by an emotional precipitating event (DiMario, 2001). Infants who experience an ALTE should be admitted and observed in a monitored unit (such as the intensive care unit) irrelevant of how well they appear upon arrival to the emergency department (Claudius & Keens, 2007; Goldberg et al., 2007). Up to a 68% recurrence rate of severe ALTEs is likely to occur in the first few days (Samuels, 2000).

Table 3.
Apnea Nursing Interventions

• Assess color, perfusion, respiratory rate, heart rate, position, and oxygen saturation.
• If associated with a feeding, assess gastric tube placement and infusion rate.
• Administer methyxanthines as ordered by advanced practice nurse or physician.
• Ensure neutral temperature in environment.
• Provide positioning that avoids airway obstruction (flexion and hyperextension of the neck).

Source: Freda, Vargo, & Trotter, 2007.

Inpatient Observation

Patients admitted for observation should be paced on a cardiorespiratory monitor with pulse oximetry. Frequent assessment is necessary, and infants should be placed in full view for observation when possible. For example, a nurse may observe color changes before the monitor alarms or can quickly respond to a parent's call that the infant has become limp. This allows for quick intervention to prevent post-event lethargy and minimize the time in which the infant experiences hypoxemia. Nurses may observe an infant whose apnea alarm is triggered, indicating a 20-second cessation of breathing, yet observe a chest rise, indicating that obstruction is a possible cause of apnea.

In some cases, physical signs lag behind technological equipment, rendering the presentation of an infant who has already begun to recover from a central apnea event. It is important for the nurse to recognize that shallow breathing and short episodes of central apnea lasting less than 15 seconds and periodic breathing can be normal events in young infants as long as they are not associated with color changes, alterations in heart rate, or cardiac instability (Fu & Moon, 2007; Shah & Sharieff, 2007). It is important to thoroughly report and document findings and interventions. Table 2 provides a guideline for the elements of documentation for a nurse's note.

Nursing Interventions

Emergent Care

Table 3 contains a list of nursing interventions when an infant is found to be apneic. When an infant is found to have color changes and a fixed gaze, or change in muscle tone, immediate stimulation should be initiated. Appropriate stimulation may range from gentle movement and blowing air on the infant's face to more vigorous stimulation, such as flicking the foot using one's thumb and index finger to induce a pain response. Stimulation causes arousal, with more vigorous stimulation causing an adrenergic response that may raise the infant's heart rate and stimulate a breath. In studies on SIDS, the primary mechanism hypothesized is a lack of arousal to hypoxemia (Kato et al., 2003). When an apnea monitor alarms for bradycardia and lack of diaphragmatic movement simultaneously indicating a central apnea event, vigorous stimulation is immediately indicated. If the infant fails to cry, the nurse should call for help and place the infant in the position indicated for rescue breathing (on a flat, firm surface with the chin slightly elevated), offer another vigorous flick to the feet, and proceed to follow the usual cardiopulmonary resuscitation protocols.

Following an ALTE, it is not uncommon to find an infant lethargic depending upon the length of time of the apnea event. The infant will likely benefit from a liter of blow-by oxygen administration until full recovery is observed (active infant without duskiness or circumoral cyanosis). Infants who are prone to repeated ALTEs will benefit from the parents administering oxygen in the home. If parents witness the ALTE, emotional support should be offered.

Therapeutic Interventions

Other than pharmacologic management and prevention, there is little treatment for ALTEs specifically. One report (Valusek et al., 2007) describes the use of fundoplication for the prevention of ALTEs when gastroesophageal reflux disease is the cause of recurrent events. Pharmacologic management depends largely on the hypothesized diagnoses and causes of the ALTE. For example, apnea of prematurity and some cases of central apnea may be treated with caffeine. If there is evidence to suggest diminished pulmonary reserve, than bronchodilators and inhaled corticosteroids are appropriate. Gastroesophageal reflux disease is often treated with proton pump inhibitors, H_2 agonists, or antiemetics. All infants should have the appropriate vaccinations recommended by the AAP, including palivizumab (Synagis®) up until the age of 24 months if a qualifying comorbidity exists and age-appropriate influenza vaccine (AAP, 2007). Administering oxygen throughout the apneic event and during the immediate recovery phase may benefit some infants by normalizing their oxygen saturation. Family members may appreciate observing their infant turn pink, which more rapidly serves to alleviate fear or anxiety.

Home Apnea Monitoring

Whether or not an apnea monitor (for example, Respironics® 2 channel) and pulse oximeter should be prescribed for home use could be established based on the findings of a polysonography sleep study. Polysonography evaluates the quality of sleep and can assist in determining the etiology of sleep apnea (central versus obstructive types). However, it is not always feasible to have a bedside polysonography during a brief hospital admission. The routine prescription of home cardiorespiratory monitors is controversial and currently recommended in limited situations, such as symptomatic lung disease, airway instability, use of continuous positive airway pressure, and in premature infants up to 43 weeks post-menstrual age with a history of apnea/bradycardia (AAP, 2003).

Apnea monitors are utilized to alert the caregiver that an event is occurring. Originally intended to assess parental compliance with home monitoring, apnea monitor data are not sufficient to identify pathophysiology (Poets, 2004). Apnea monitors do not provide information about oxygenation levels, only breathing movements and heart rate. Through continuous recordings that can be downloaded to a computer, a relatively valid means for the healthcare provider to assess the frequency and duration of events that can be linked to caregiver reports of physical signs of an ALTE is provided (Poets, 2004).

Apnea monitors have not been shown to prevent events or mortality due to events or SIDS. For example, Poets (2004) found in a study of apnea monitor downloads of infants who died on the apnea monitor that bradycardia alarms and a gasping breath movement indicating hypoxemia were the only indication something was occurring. Thus, parents should be educated that bradycardia alerts in the absence of apnea alarms may indicate hypoxemia and the possibility of a dangerous event.

If pulse oximeters are not used to validate the bradycardia alarm, stimulation should be administered to the infant to cause arousal. Nonetheless, infants who have experienced an ALTE should be safeguarded with an apnea monitor. Apnea monitors are typically set at an alarm of 20 seconds with each beep representing an additional second of apnea. Bradycardia alarms are typically set at below 80 beats per minute in the very young, and as infants approach 1 year of age, may be lowered to 70 beats per minute. A heart rate of below 60 beats per minute is an indication for chest compressions, according to American Heart Association Guidelines (American Heart Association, 2006).

Pulse oximetry is a useful adjunct to the apnea monitor and is particularly useful in evaluation during the recovery period. Pulse oximetry may be used continuously or for spot-checking heart rate and oxygen saturation during or following an ALTE. After the age of one and/or when infants are more active (for example, crawling and standing in bed, or being switched from a crib to a toddler bed), apnea monitors pose additional injury risk, such as strangulation. In lieu of an apnea monitor, some infants may benefit from a pulse oximeter with a short line, especially mobile infants who are rolling and creeping in their beds. To promote developmental mobility while preventing strangulation, parents need to be assisted in uncovering antecedents to the ALTE so they can collaborate with the physician to establish the best times to remove the apnea monitor.

It is important to recognize there are pitfalls to apnea monitors for home use linked to caregiver error as well as the sensitivity of the instrument. The manufacturer's instructions need to be followed closely to ensure reliability of detection of chest wall movement. Leads and wiring should be on correctly, and the belt must be properly secured to ensure adequate detection of chest movement (for example, one to two finger spaces). Shallow breathing alarms are often misinterpreted by caregivers to be false alarms. However, shallow breathing or hypopneas are typically an indication of poor pulmonary reserve or ineffective airway function requiring investigation. Another pitfall of using an apnea monitor may include false reassurance that the infant is not apneic when it stops alarming or only alarms bradycardia with chest wall movement. Indeed chest wall movement may be observed with hypopneas or full obstructive apnea events. In either case, intervention is warranted, and the actual function can only be assessed if the events occur during a full 1-channel polysonography.

Polysonography is a complete sleep study interpreted by a pediatric pulmonologist. This test is the most reliable means of differentiating central versus obstructive apnea events. Typically, an overnight stay is required in a controlled setting. In addition to evaluating the quality of sleep, and type and frequency of apneic events, diagnostic tools, such as a pH probe and/or electroencephalography (EEG), may be included to identify if gastroesophageal reflux disease and/or seizure activity contribute to the etiology of apnea. Given financial costs of home apnea monitoring ($300 to $400/month and emergency room visits for false alarms), a polysonography sleep study may be a cost-effective means of determining which infants are most likely to benefit from the use of home apnea monitoring. Having an infant dependent on technology for life support is not without emotional costs to family members. Normal routines, including sleep, are disrupted for caregivers and pose vulnerability to negative coping patterns. Emotional reactions, such as fear, anger, sadness, anxiety, and depression, are common responses to having a child who is perceived to be abnormal (Rolland, 1994).

Parents should be educated in constant and frequent supervision of the infant at risk for ALTEs during awake hours and advised to intervene based

on observed symptoms as opposed to waiting for an alarm. The antecedents to any events should be recorded and reported to the physician. Frequent observation and reporting of symptoms will help diagnose the causes and contributing factors to the events. All parents should be educated in keeping a diary of anteceding, concurrent, and recovery-phase symptoms and events during an apnea alarm. Parents need to be educated in infant cardiopulmonary resuscitation and should be able to return-demonstrate the procedure.

The best method of delivering CPR training is by using simulation that closely resembles a realistic situation (for example, finding blue infant in crib) (Hunt, Fiedor-Hamilton, & Eppich, 2008). Apnea monitors are considered to be life-support equipment; thus, parents should be educated in procedural safeguards for activating the emergency medical system (EMS). For example, the police department and ambulance service should be notified that the child resides in their district. The telephone and electric service should also be notified so that services are maintained and restored in a service outage to ensure access to the EMS. Preparation for disasters and power outages should be in place. Finally, primary caregivers need to be trained in CPR prior to discharging the infant from the facility.

Neonatal Intensive Care (NICU) Discharge

Some neonatologists do not consider apnea events during feedings in their decision to treat the apnea, presuming obstructive events. However, this needs to be addressed equally from the perspective of preventing ALTEs once the infant is in the community, since aspiration is a recognized cause of ALTEs (McGovern & Smith, 2004). Once in the community, apnea monitor readings are typically sent to the physician, usually a neonatologist trained in interpreting the readings, who orders the apnea monitor. However, unless a system is in place for the infant to be followed by the neonatologist, the infant may be left vulnerable. When discharging an infant from the neonatal intensive care unit (NICU), parents should be advised as to who will receive downloads and the turn around time for feedback for caffeine dose adjustments. Timely interpretation is essential for differentiating diagnoses and for medication adjustment, especially in light of the recent findings of the benefits of the use of caffeine in apnea of prematurity in preventing long-term pulmonary and neurodevelopmental consequences of prematurity (Schmidt et al., 2007; Stevenson, 2007). Apnea monitors are typically used for 5 to 7 days continuously until there are no events (Spitzer & Gibson, 1992).

Parents need to have a contact number for a clinician who can assist them with frequent alarms, especially if the infant is symptomatic of an ALTE or apnea of infancy. Often, the NICU staff and/or the respiratory therapists affiliated with the provider of the apnea monitor may be available for consultation 24 hours a day. This can prevent unnecessary hospital admissions and facilitate differentiating potential causes of ALTEs. Primary caregivers require education in ways to increase the reliability of alarms. For example, good contact must be made between the electrodes and infant skin and placed properly per the operator's manual of monitor. Monitors may fail to detect events when electrodes are placed in the incorrect position (for example, leads upside down or wires specifying detection of respirations are reversed with heart rate) and when infants are held while sleeping (for example, co-sleeping or close chest contact can cause the monitor to detect the caregiver's breathing pattern).

Finally, it is not uncommon for primary care physicians to feel inadequate when it comes to monitor interpretation. It is essential that family members be provided with the contact information of a physician who can interpret the results of the monitor (for example, a sleep-certified pediatric pulmonologist). Ensure that if being discharged from a NICU that the neonatologist has the capability of fully following the infant and available to act as a consultant to the family if he or she is the designated provider to receive the monitor downloads. It is often the ordering physician who automatically receives the downloads. Primary pediatricians are not comfortable interpreting downloads and treating patients according to the downloads. Early referral to a pulmonologist can help ensure timely interpretation of downloads.

Psychosocial Support Of Family

By definition, an ALTE is an event that is perceived as frightening by the witness. Depending upon the degree of intervention needed for full recovery from the apnea event, some parents may experience an array of emotions. Memories may be traumatic, and parents should be assessed for signs of post-traumatic stress disorder, which require intervention by a mental health professional. A recent meta-analysis reveals that post-traumatic stress disorder has a prevalence of 19.6% in mothers, 11.6% in fathers, and 22.8% in parents in general of children with chronic illness (Cabizuca, Marques-Portella, Mendolowicz, Coutinho, & Figueira, 2009).

Referral to a local apnea support group may be helpful. Some studies have shown that parents of infants going home on an apnea monitor are at risk for depression and hostility two weeks after discharge, even if they display positive feelings toward having the infant on the monitor (Abendroth, Moser, Dracup, & Doering, 1999). Table 4 presents some questions that may be useful for nurses to ask when assessing for post-traumatic stress disorder. Positive responses may be an indication of an expected stress response. Valid and reliable screening tools for post-traumatic stress disorder are available (such as the Trauma Screening Questionnaire by Brewin et al., 2002).

However, it is important to have a mental health clinician determine the relative risk of developing post-traumatic stress disorder in a parent or other family member witnessing the event. Parents may benefit from a referral to a social worker for a home visit within two weeks following discharge with an apnea monitor (Aberndroth et al., 1999). Parents benefit from reassurance and validation of reports because they often perceive that health care providers do not believe their reports. A provider should avoid outwardly opposing a parent on reports or show obvious signs that they disbelieve reports, even if the infant looks perfectly well and stable upon arrival to the emergency department.

Another condition causing parents to feel they are disbelieved may be provider scrutiny; Münchhausen by proxy or factitious disorder may be present. This is a condition whereby a caregiver, usually the mother, deliberately harms his or her child for attention from health care providers (Bretz & Richards, 2000). Victims of deliberate child abuse are usually less occult in the appearance of injury than victims of Münchausen by proxy. According to the DSM-IV-TR, the criteria for diagnosis of a factitious disorder by proxy include the following: the caregiver intentionally produces

Table 4.
Questions for Evaluating for Post-Traumatic Stress Disorder

Determining if ALTE was potentially traumatic*:
• Was your infant hospitalized? • Did you believe the child may die? • Did you believe the child may be permanently injured?
If items endorsed, than event was potentially traumatic and may proceed to screening for trauma items:**
• Are there upsetting thoughts or memories about the event that come into your mind against your will? • Do you have upsetting dreams about the event? • Do you ever act or feel as though the event is happening again? • Do you feel upset by reminders of the event? • Do you have bodily reactions (such as fast heartbeat, stomach churning, sweatiness, dizziness) when reminded of the event? • Do you have difficulty falling or staying asleep? • Do you have difficulty concentrating? • Do you experience irritability or outbursts of anger? • Do you have a heightened awareness of potential dangers to yourself or others? • Do you experience jumpiness or being startled at something unexpected?

* All items adapted from Kean, Kelsay, Wamboldt, and Wamboldt (2006).
** All items taken from the Trauma Screening Questionnaire (TSQ) as found in Brewin et al., 2002.

or feigns physical or psychological signs or symptoms in another person who is under his or her care; the motivation for the caregiver's behavior is to assume the sick role by proxy; external incentives for the behavior, such as economic benefits, are absent; and another mental disorder is not the cause of the behavior.

Patient Education

Parents benefit from anticipatory guidance and education in areas such as safe positioning and how to differentiate normal from pathologic color changes. For example, flushing and acrocyanosis are relatively normal. Standard education includes the same elements as indicated for SIDS prevention, such as using a pacifier from birth if not breastfeeding until six months of age and if breastfeeding pacifier use begins at one month, sleeping in the same room within close proximity to a caregiver until six months, avoiding nicotine exposure and herbal agents, avoiding overfeeding, overheating, avoiding soft surfaces and items in bed (alternative to blanket may be one piece wearable infant blankets), sharing the same sleep surface, and prone positioning (AAP Task Force on Sudden Infant Death Syndrome, 2005).

Prone sleep has not been shown to be linked to ALTEs (Bhat et al., 2006). Although the link between SIDS and ALTEs is controversial, parents should be questioned as to whether or not there is a family history of SIDS. If there is a positive history of SIDS, parents may benefit from knowing that studies reveal that victims typically have less arousal from deep sleep after midnight, with frequent awakenings early in the evening (Bhat et al. 2006; Kato et al., 2003). It may provide reassurance for parents to know their infant does not fit the sleep profile of a SIDS victim. If the infant is found to meet the sleep profile, he or she should be deemed to be at high risk, and specialist referrals for further diagnostic testing are appropriate (the neurologist for brain stem abnormal MRI, or genetic testing for predictors of congenital hypoventilation syndrome).

Finally, given that many problems experienced by apneic infants are not dissimilar from other high-risk infants, such as prematurity, the March of Dimes offers helpful opportunities for support and education to parents of infants who have been in the NICU. An online community for parents to share experiences can be found at marchofdimes.com/share.

Conclusion

ALTEs are by definition unexpected events. Thus, it is difficult for researchers to secure a large enough sample for prospective randomized-controlled trials. The causes of ALTEs are also numerous. Thus, the strength of evidence for recommendations are primarily anecdotal using case series studies. Nonetheless, it has been learned that parents and infants require expert detailed attention when an ALTE occurs to improve quality of life. After reading this article, nurses should feel empowered to provide thorough case management that has the potential to enhance quality of life for infants and their families. Premature infants are an especially vulnerable population, potentially prone to disparities in health care due to their unique and complex health care needs. Comprehensive care and anticipatory guidance can help eliminate masking by apnea of prematurity of serious conditions that initially present as an ALTE. Frightening events to witness, ALTEs require prompt intervention, ongoing validation, and support and education of primary care givers.

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