It has been some time since VCPN staff reviewed literature about medical aspects of child abuse. Issue 45, Medical Management of Child Abuse and Neglect, reviewed the literature and best practices up through its publication in 1995. This issue of VCPN examines the literature in order to update the reader about new research findings and guidance. More recent advancements have also addressed conditions that mimic abuse.

**GENERAL GUIDANCE**

Ignoring even minor abuse can lead to re-injury and increased morbidity since as many as 35 to 50 percent of children with inflicted injuries are likely to be re-abused unless there is intervention (studies cited in Mudd & Findlay, 2004; Kellogg, 2007).

Serious injuries in children under age two are suspicious unless a known cause such as a motor vehicle accident explains the injury. When examining the injury, the clinician should consider whether or not the explanation for the injury is plausible given the child’s age and stage of development. Was the child taking any medication? Was there a delay in seeking medical treatment? Were there multiple injuries? What is the general condition of the child (is there evidence of ongoing neglect?) (Mudd & Findlay, 2004).

John Leventhal offers guidance about medical evaluations of suspected child abuse in his article, *Thinking Clearly About Evaluations of Suspected Child Abuse* (2000). He offers 22 suggestions and points about the process of data-gathering and decision-making. (See the reviews of guidelines, this issue). Space prohibits repeating all of his ideas and those in other guidelines but readers are referred to these helpful documents to supplement the information in this article.

Several authors (Kellogg, 2007; Kos & Shwayder, 2006; Shnaps, Frand, Rotem & Tirosh, 1981) suggest that obtaining the family’s medical history as well as the child’s medical history can be crucial. It is important to consider whether the child has had injuries in the past that are suspicious and whether or not siblings have a problematic medical history.

Knowledge of the parents can be helpful, especially mental health history (such as substance abuse or depression), history of domestic violence, how regularly the parent brings the child for well baby/child visits and immunizations, and the general relationship with the child (Kellogg, 2007; Shnaps et al., 1981). According to fatality review data of 149 deaths over an 8-year period in Missouri, among physical abuse victims, young children who reside in households with unrelated adults are at higher risk for inflicted-injury death. Most perpetrators are male (often the child’s father or the boyfriend of the child’s mother) and most are residents of the child’s home (Schnitzer & Ewigman, 2005).

Information should be gathered in a non-accusatory but detailed manner. According to Kellogg (2007), information that is useful in the assessment includes:

- Past medical history (trauma; hospitalizations, congenital conditions, chronic illnesses; weight patterns);
- Family history (especially bone disorders, metabolic disorders, and genetic disorders);
- Pregnancy and birthing history (whether or not children were wanted; pregnancies unplanned or not; postpartum depression; delivery settings; delivery complications);
- Family patterns of discipline;
- Child temperament;
- Past abuse history of parents, siblings, child;
- Developmental history of the child;
- Substance abuse by caregivers or those in the home;
- Resources and social or financial stressors;
- Violent interactions between family members.

The presenting injury or problem must be addressed as well. Use of a pediatric consultant or a multi-disciplinary team is recommended, but Kellogg (2007) notes that physicians are mandated by law to report suspicious injuries and should not delay reporting pending testing or additional information, as reporting laws provide immunity for good-faith reporting. Detection is important, says Kellogg, since child abuse may recur at least 35% of the time without appropriate detection and treatment. Detection depends upon the clinician’s ability to recognize suspicious injuries, conduct a careful and complete evaluation and consider whether or not the caretaker’s explanation supports the injuries.

Explanations that are concerning for intentional trauma would include (Kellogg, 2007; Mudd & Findlay, 2004):

- No explanation or a vague explanation for a significant injury;
- One or more important details in the account change dramatically;
- The explanation is inconsistent with the pattern, age, or severity of the injuries;
- The explanation is inconsistent with the child’s developmental abilities;
- Different witnesses provide markedly different accounts for the injury.

Doctors are also responsible for documenting injuries. Guidance is available for continued on page 2
Medical Aspects

continued from page 1

proper documentation (see guidelines reviewed in this issue). Photographs of visible lesions are recommended as well as written documentation. Photographs should include an anatomic landmark to identify the location of the injury. A measuring device included in the photo can help establish an accurate representation of the size (U.S. Department of Justice, 2000). Photographs are part of the medical record. As such, they are legal documents subject to the same storage and release as other medical records (Botash, 2000).

After analyzing medical records of children presenting to the Emergency Department of Sydney Children’s Hospital, researchers Taitz, Moran, and O’Meara (2004) concluded the doctors in the Emergency Department miss indicators for abuse because they do not look for indicators in the history. The study serves as a reminder of the importance of mandated training.

Pediatricians acknowledge many limitations in providing care to child abuse victims and there is interest in the development of subspecialists. Following encouragement by the American Academy of Pediatrics, the American Board of Pediatrics created a subspecialty board named Child Abuse Pediatrics to qualify pediatricians who have completed additional training in the field of child abuse and neglect (Lane & Dubowitz, 2009). Many children now have access to a Children’s Advocacy Center with medical experts.

SKIN AND SOFT TISSUE INJURY

BRUISES, ABRASIONS, AND LACERATIONS

The most common manifestations of child abuse are cutaneous (Ermerctan & Ertan, 2010). However, many cutaneous injuries are due to benign childhood injuries and medical conditions, so it is important to differentiate between inflicted injuries and signs that may mimic an inflicted injury. Cutaneous manifestations of child abuse include bruises, lacerations (including bite marks), abrasions, burns, and oral trauma (Kos & Shwayder, 2006).

Bruises are common in healthy, vigorous children who are ambulatory (Maguire, Mann, Hibert, & Kemp, 2005; Mudd & Findley, 2007). For example, Reece and Ludwing (2001) found that 40 to 50% of ambulatory children had bruises over bony prominences on the front of their bodies. However, there generally were fewer than 3 bruises and the bruises were smaller than 10 mm in size. Likewise, Labbe and Caouette (2001) found that after the age of 9 months, three-quarters of all examined children were likely to have at least one skin injury, especially in summer months. Sugar, Taylor, & Feldman (1999), examining children younger than 36 months coming for well-child visits, found that 17.8% of “cruisers” and 51.9% of walkers had bruises. “Cruisers” had an average of 1.3 bruises (1-2 bruises per child) and walkers averaged 2.4 bruises (range of 1 to 11 per injured child). There were no differences by sex.

Bruises on the skin are very typical and are a common, normal finding for ambulatory children (Barber & Sibert, 2000) and scratches from an infant’s fingernails are likely on the face or head in the 0- to 8-month age range (Labbe & Caouette). However, for infants younger than 9 months who are not yet cruising or who are non-mobile, bruises unrelated to known medical conditions are rare and should raise concern of maltreatment (McMahon et al., 1995; Sugar et al., 1999).

The expected locations for normal, non-inflicted bruising are the shins, knees, upper legs, and the forehead. Therefore, bruising in atypical areas, such as the face, buttocks, hands, and trunk, raise concerns about the possibility of abuse (Mudd & Findley, 2004).

If there is a single injury, distinguishing between accidental and inflicted bruising may be difficult (Stephenson, 1995). However, multiple and more severe bruising, especially on the head and face, is suggestive of abuse (McMahon et al., 1995). The number of injuries, their site, their age and shape can in combination help in forming an opinion (Stephenson).

Patterned injury can be an indicator of maltreatment. Various instruments are used to injure children including belts, extension cords, the abuser’s hands, and teeth. Patterned bruising can indicate the type of instrument used. DNA evidence can be collected from bites (Mudd & Findley, 2004).

Bite marks can also raise suspicion of abuse. It is important to document the shape, color, and diameter to help identify possible perpetrators. Human bite marks are typically superficial whereas animal bites may cause deep punctures (Ermerctan & Ertan, 2010).

Aging bruises can assist in the evaluation. Bruises can be red, blue, purple, black, green, or yellow (Mudd & Findley, 2004). Aging bruises can be difficult, as bruises of identical age and cause on the same person may not appear as the same color and may not change at the same rate. A chronically or repetitively injured child may heal more quickly than an acutely injured child with a single injury that is not repeated (Schwartz & Ricci, 1996).

Red can be present in bruises regardless of age. A bruise with yellow is likely to be more than 18 hours old, but a bruise with no yellow is not necessarily less than 18 hours old (Langlois & Gresham, 1991). Thus, yellow can be a reliable sign of an older bruise.

Gathering a Comprehensive History

A comprehensive history is crucial to determining whether an injury is accidental or inflicted. There are several considerations when gathering history. Obtaining past medical records, including birth records, can assist with understanding ongoing medical problems (such as the child having a bleeding disorder) and can help clarify whether an injury is due to disease, accident or maltreatment.

An examination of the present injury should be undertaken with several questions in mind:

• Does the child have a history of multiple, unexplained injuries?
• Is there a history of use of multiple medical facilities?
• Are there repeated Emergency Department visits?
• Could the injury have occurred accidentally given the child’s age and stage of development?
• Does the history of the injury match the presentation of the injury?
• Does the child have multiple injuries?
• Is the child taking any medications?
• Was there a delay in seeking medical treatment?

The child should be interviewed separate from the caretakers, if the child is verbal. Allow the child to offer a spontaneous history by asking “open-ended” questions. For example, simply ask the child what happened to cause the injury. Then the examiner should embark upon specific questions. These can include who was present, the exact location of the injury or the events, what was happening before the injury, whether or not there have been similar incidents in the past, how injuries are usually handled in the child’s family, and whether or not siblings have had similar problems.

The examiner should try to avoid “yes/no” questions. Young children will not be able to relate dates but may be able to recall whether or not an event happened before or after a major holiday. Children 12 and over should be able to relate a complete narrative and if they are unable or unwilling to do so, care should be taken to determine why the child is not forthcoming.

Parents or caretakers can also be queried. Their story should approximate the account given by the child. Any discrepancies should be noted.

Source: Mudd & Findley, 2004
but its absence is less significant (Schwartz & Ricci, 1996). How soon bruising first appears depends on the depth of the injury. Superficial bruises may discolor the skin immediately while deeper bruising can take days to appear. A child who has been bruised both deeply and superficially at the same time in nearby locations may have bruises of differing color that appear to have been inflicted at different times (Schwartz & Ricci, 1996).

Many other factors affect the appearance of bruises, including: location; skin complexion; medication use; ambient light, and the severity of the force causing the bruise (Mudd & Findley, 2004; Schwartz & Ricci, 1996). One tool that can assist in detecting bruises is a Wood’s lamp. The ultraviolet light produced enhances fainter bruises and soft tissue injuries not easily apparent to the naked eye (Vogeley, Pierce, & Bertocci, 2002).

Given the difficulty in aging bruises, the estimated age of bruises should never be the sole criterion for a diagnosis of child abuse. Age of bruises can be one component in a comprehensive assessment that uses a careful history of the injury, past medical history, family history, associated risk factors, a detailed physical examination, and appropriate laboratory testing (Schwartz & Ricci, 1996).

Some authors take an even stronger stand. Maguire et al. (2005) write, “a bruise cannot accurately be aged from clinical assessment in vivo or on a photograph. At this point in time the practice of estimating the age of a bruise from its color has no scientific basis and should be avoided in child protection proceedings” (p. 187). Their review and data indicate that the accuracy of aging a bruise to within 24 hours of its occurrence is less than 50%.

Dr. Anthony Shaw a pediatric surgeon and consultant to this issue of VCPN (see separate block), notes that assessment of bruises and other cutaneous injuries can be further complicated by photographs of poor quality.

“The importance of careful documentation and clear photographs is crucial to those of us who review cases at a later date,” he explains.

Maguire et al. (2005) reviewed all the literature from 1951 to 2004 that examined patterns of bruising that are suggestive of child abuse. A panel of 15 reviewers reduced 6984 citations to 161 potentially relevant texts. Of these, 23 met the inclusion criteria. After the review, the authors concluded that bruises should never be interpreted in isolation, but always assessed in the context of medical and social history, developmental stage, explanation given, full clinical evaluation, and relevant study and investigation. That said, there were indicators of possible physical abuse:

- Multiple bruises in clusters
- Bruising in uncommon locations such as the face, back, abdomen, arms, buttocks, ears, and hands
- Bruises in children less than nine months of age or who are not mobile
- Multiple bruises in uniform shape
- Bruises that carry the imprint of an implement or a ligature (patterned bruises)
- Bruises that are away from bony prominences

In 2010, Pierce and colleagues published a clinical decision rule derived from their research on children ages 0 to 48 months. The authors claim the rule’s sensitivity is 97% (it correctly identified 32 of 33 abuse victims) with a specificity of 84% for predicting abuse (correctly identifying 32 of 38 accident victims). The decision rule for bruising has three questions: 1) Is there bruising in the torso (chest; abdomen; back; buttocks; genitourinary region; hip), ear, or neck regions of a child 4 years old or less? 2) Is there bruising in any region of an infant less than 4 months of age? 3) Is there a confirmed accident in a public place that accounts for the bruising?

Dr. Anthony Shaw was our guest consultant for this issue of VCPN. Perhaps no one deserves more credit for Virginia’s response to child abuse and neglect than Dr. Shaw. For many years, Dr. Shaw lived and worked in Charlottesville, VA where he was Chief of Pediatric Surgery at the University of Virginia Medical Center. UVA did not have a child abuse multidisciplinary team, so Dr. Shaw founded Virginia’s first hospital-based multidisciplinary team for child abuse and neglect.

When Governor Linwood Holton held public hearings, Dr. Shaw and his associates testified about the need for a child abuse and neglect reporting law. Dr. Shaw worked with Delegate Tom Mitchie to craft legislation that became Virginia’s 1975 child abuse and neglect reporting statute. The legislation also established the Governor’s Advisory Board on Child Abuse and Neglect. Dr. Shaw served on the Board for five years and was its first chairperson.

Dr. Shaw left Virginia to accept a professorship at the University of California Los Angeles. He has continued active involvement in the child abuse and neglect arena and is frequently called upon to consult on cases and provide expert testimony. He is on the panel of expert witnesses for child abuse for the Los Angeles County Superior Court.

**BURNS**

Burns are a common and often serious injury for children. A review by D’Souza, Nelson, & McKenzie (2009) examined pediatric burn injuries in US emergency departments from 1990 until 2006. They estimate that 2,054,563 patients 20 years and younger were treated for burns during the study time period, an average of 120,856 cases per year. Over the time period, the injury rate per 10,000 children decreased 31%. Boys were more likely to sustain burns (58.6% of cases) and children under age 6 were disproportionately represented, especially in scald burns (Ruth, Smith, & Bronson, 2003).

Burns due to abuse comprise 6 to 20% of cases of physical abuse. Most inflicted burns occur during the developmentally-challenging ages of 1 to 3 when caretakers may feel over-taxed (Peck & Priolo-Kapel, 2002). Assessment is compromised by the limited ver-
According to Dr. Anthony Shaw, the most common burns are scald burns. “The severity of the burn is related to the temperature of the scalding liquid, the length of exposure to the scalding liquid, and the age of the child. The youngest children have thinner skin and the highest risk,” he explained.

Accidental immersion burns typically have irregular borders and non-uniform depth as the child struggles to escape the hot liquid. The thrashing causes splash marks, which can also be found in non-accidental injuries. Characteristic features of forced immersion burns are clear lines of demarcation, uniform depth of burns, and they commonly occur in the areas of buttocks, lower extremities, hands, and perineum. “Zebra stripes” can occur as the child flexes and “donut-hole” sparing occurs when the child’s buttocks are pressed against the relatively cooler bathtub (Kos & Shwayder, 2006).

Splash and spill burns are scalds resulting when a hot liquid is thrown at or poured on a child. They can occur accidentally when a child spills a hot liquid and they are not a frequent form of abuse. The burns are generally not as severe as immersion burns as the hot liquid is in contact with the skin for less time and the liquid cools rapidly. Associated splash marks are seen frequently.

Distinguishing between accidental and abusive injuries can be difficult. Both have irregular margins and variable depth. Both have the largest and deepest part of the burn at the contact point, and the burn narrows and become less severe as the liquid travels (this presentation is sometimes termed an “inverted arrow”). Inflicted flow burns are more likely on the buttocks and perineum, usually from holding a child under a running faucet. Accidental injuries are likely to involve the head, neck, and trunk as the liquid is pulled or knocked over from a higher surface by a child (Kos & Shwayder, 2006).

The child’s clothing should be collected as it may provide information about the cause of the burn. The history, number of burns, and the burn pattern may be indicators (Kellogg, 2007). Burns in younger children can signal neglect. Infants and young children require constant supervision and burns due to negligence can clearly be prevented (Greenbaum, Donne, Wilson & Dunn, 2004). Inflicted burns that are misdiagnosed as accidental can result in inappropriate medical care, ongoing abuse, and even fatality. Inflicted burns are often more serious and are associated with longer hospital stays, more complications, greater need for operations, and higher morbidity. Rates of mortality are twice as high for inflicted burns compared to accidental ones (5.6% compared to 2.6%, reported in Purdue, Hunt & Prescott, 1988).

Location can be an indicator of abuse injuries. For example, intentional burns are more likely to be to the hands, arms or bilaterally to the legs than accidental burns (Greenbaum et al., 2004). Montrey & Barcia (1985) found that 64% of intentionally-burned children in their sample had burns to the buttocks compared to 29% of those with accidental burns.

Cigarette burns are also a common form of abuse. Intentional cigarette burns appear as 7 to 10 mm round, well-demarcated burns with a central crater (Ermercan & Ertan, 2010; Kos & Shwayder, 2006). The location of cigarette burns can be important as inflicted cigarette burns often occur on hands, feet, legs, perineum, and buttocks (Kos & Shwayder).

According to Mudd & Findley (2004), some indicators of possible abuse include:
- Burns that appear older than the history given;
- Other injuries such as fractures accompanying the burn injury;
- Symmetrical burns;
- Burns to the buttocks;
- Cigarette or other patterned burns;
- Burns with clear lines of demarcation without splash marks.

There is agreement that the most common age range for children with inflicted burns is between ages 2 and 4 (Greenbaum et al., 2004). Similarly to all pediatric burns, boys are more likely to be affected. For intentional injuries, boys are 2 to 3 times more likely than girls to be a victim (Greenbaum et al.). While no particular ethnic predisposition exists, child abuse burns are more common in families with more than two children and occur predominately in single-parent families (Greenbaum et al.).

Some parent characteristics have been linked to burn infliction. Gaynor (1998) claims most perpetrators had histories of aggressive behaviors. Greenbaum et al. (2004) note a strong association between a parent’s own history of being a child abuse or spouse abuse victim and infliction of burns. The authors also maintain that low socio-economic status (families with scant emotional and financial resources) where the parent is also immature, combine to cause the parent to...
lose self-control and vent frustrations by burning children. Dr. Shaw mentions that in his clinical experience, the perpetrator is frequently a non-relative caretaker, rather than the parent.

**Practice Points for Assessing Burns**

- Use a checklist (see box) similar to that recommended by Benger & McCabe, 2001.
- Medical staff should be especially careful to make clear and comprehensive notes, including information about historic injuries (Greenbaum et al., 2004).
- Photographs should be taken to document the burn.
- It is vital to gain a history from the child when the parent is not present. Questions should be broader than the burn injuries as other types of physical abuse and neglect can be concurrent with the burns.
- Siblings may also be at risk.
- Medical staff should remain objective and approachable.
- Questions should be answered honestly but without prompting the parent to alter histories or to fabricate convincing alternatives.

**POISONING**

It is common for young children to ingest potentially poisonous substances. In 1994, Bays reported that more than 400,000 poisoning accidents occurred annually for children in the United States. The American Association of Poison Control Centers reported approximately 1.2 million events in the United States in 2001 (American Academy of Pediatrics, 2003). Accidental poisoning is responsible for about 7% of all child mortalities (Koushanfar, 2005). In young children, the routes of exposure to poisons include ingestion, skin contact, eye contact, and inhalation. Poisoning is also a common suicide method among adolescents.

A recent study of accidental and non-accidental poisonings found that a substantial number of children presenting to emergency department with an apparent life-threatening event had a positive toxicology screen (Pitetti, Whitman, & Zaylor, 2008). Analysis of the toxicology results found that 18.2% had a positive screen. Thirteen of the 274 children (4.7%) were positive for a medication and other authors (Hickson, Altemeier, March, & Campbell, 1989; Yin, 2010) suggest that toxicology screens be included as part of the routine evaluation of children who present with an apparent life-threatening event.

There are both child and parent characteristics associated with accidental poisonings, according to Katrivanou, Lekka and Beratis (2004). Over a four-year period, they studied 150 consecutive admissions to a pediatric unit of hospital for poisoning. Diagnosticians blindly evaluated mothers and children, using a structured interview and the mothers completed a behavioral checklist. The poisoned children were over four times more likely than control children to have externalizing behavioral problems (such as Attention-Deficit, Oppositional Defiant, or Disruptive Behavior Disorders) and internalizing behavioral problems as well. Of the 150 mothers, 56 (37.3%) were diagnosed with one or more psychiatric disorders compared to 18 mothers (12%) in the control group. Common diagnoses were Anxiety Disorders, Personality Disorders, and affective disorders. There was also a higher incidence of parent-child relationship problems. The authors conclude that higher levels of child behavior problems and parent psychopathology and disturbed parent-child relationships all increase the risk of accidental poisonings.

Homicidal poisonings are less well-studied. Shepherd and Ferslew (2009) cite U.S. Department of Justice data placing the annual rate of homicidal poisonings at 5.5 deaths per 100,000. Yin (2010) reported that on average, 160 cases of malicious poisoning of children are reported to U.S. poison centers each year and of these, about 2 children a year die. Yin notes that the cases reported to poison centers are increasing over time.

The motivations and methods of perpetrators are rather unique among criminals. Poisoning is commonly considered highly personal, surreptitious, and premeditated. There are a number of reasons a caretaker may maliciously and intentionally administer poisons or non-prescribed substances to a child. A crying baby may be sedated to encourage the infant to sleep. A child who has an injury due to physical abuse may be sedated rather than offered medical care. A caretaker may simply want relief from child care responsibilities. Muchaussen by proxy (a condition where the parent receives gratification and attention from having a child who is seriously ill) is described later in the article. Drug-facilitated sexual abuse has been documented (Yin, 2010). A parent may also be angry with a child and uses forced ingestion of a substance such as salt or tobacco sauce as a discipline technique or as retribution.

Detection of poisoning cases is more complex than in situations where there is obvious physical harm such as bruising or fractures (Shepherd & Ferslew, 2009). The variations in presentation range from coma to red coloring in the diaper. The complexity is shown in a study by Dine and McGovern (1982) where the cases of 48 children.
thought to be victims of deliberate poisoning were examined. A total of 27 different types of poisons or household agents were utilized by abusing parents. The most frequent agent was salt poisoning with water restriction. Babies and young children have immature livers with limited ability to excrete excess sodium. Babies and young children can be denied water as well which compounds the effects of the poisonous substance.

Meadow (1992) also found salt poisoning was common but listed other common agents such as laxatives, hypnotics, anticonvulsants, pest killers, and horticultural products. The use of barbiturates and tranquilizers as a poison agent is also frequent. An unusual practice that has been deadly in at least 3 cases is forced water intoxication (Arieff & Kronlund, 1998).

Homicidal poisonings occur more frequently at extremes of age, with homicidal poisoning of infants occurring 8 to 9 times more often than for the general population (Shepherd & Ferslew, 2009).

Shepherd and Ferslew (2009) posit that the typical child abuse poisoning of an infant involves a parent or caregiver with poor coping skills in a stressful situation trying to quiet or sedate a noisy baby. Other acts may be negligent and some can be related to peripartum psychiatric disorders. Several authors have linked mental illness, substance abuse, marital conflict, a high level of family problems, or over-involvement with the child with poisonings (Hickman et al., 1989; Rogers et al., 1976; Shnaps, Frand, Rotem, & Tirosh, 1981; Sobel & Margolis, 1965).

Ipecac used to be a recommended method for inducing vomiting in cases of suspected ingestion of poisons. Research has indicated that ipecac is a poor and unreliable performer, with a range of 0% to 78% of the material recovered even if given immediately. There can be adverse effects including persistent vomiting, diarrhea, and lethargy in addition to the administration being an unpleasant experience. According to the American Academy of Pediatrics, use of ipecac does not reduce emergency room visits or improve outcome. Use of ipecac may mean that children are unable to tolerate other orally-administered treatment.

Of even greater concern is the misuse of ipecac. Examples include adolescents with eating disorders using ipecac to induce vomiting and use by caregivers involved with Munchausen syndrome by proxy.

Due to misuse of syrup of ipecac and to lack of clear evidence of its effectiveness, the American Academy of Pediatrics is no longer recommending that it be used as a home treatment strategy for poisoning. Rather, the first action for a caregiver should be to consult with the local poison control center. (See spotlight, this issue for the Virginia’s Poison Center, 1-800-222-1222.)

FRACTURES

After skin and soft tissue injury, fractures are the second most common presentation of physical abuse. Approximately one-third of physically abused children will eventually be examined by an orthopedic surgeon (Banaszkiewicz, Scotland, & Myerscough, 2002; Kocher & Kasser, 2000).

Most children who sustain fractures have fallen, been involved in motor vehicle crashes, or have experienced other accidental major trauma. In addition, a small group of children are more susceptible to fractures due to underlying conditions that contribute to bone fragility (Kemp et al., 2008).

Abuse fractures occur when a limb is pulled, twisted grasped or used as a handle to swing or shake the child (Spencer, 2002). When evaluating a child for abuse, it is important to consider the age of the child, the overall injury pattern, the stated mechanism of injury, and the pertinent psychosocial factors in each case.

Age of the Child

The majority of non-accidental fractures occur in infants and preschool-aged children. For example, Bulloch et al. (2000) found that of 39 infants with rib fractures, 82% were caused by child abuse. There is general agreement that infants under the age of one year with fractures have a high prevalence of abuse. The younger the infant, the greater the likelihood that the fracture is inflicted (Cadzow & Armstrong, 2000; Hoskote, Martin, Hornbrey, & Burns, 2003; Kemp et al., 2008). Those under the age of four months have an even greater likelihood of abuse as the cause of their fracture. Any fracture in a child less than age two without a significant associated history of accident should raise suspicion (Spencer, 2002). Further, Kemp et al. (2006) recommend that all children under the age of two years where physical abuse is suspected be investigated to exclude fractures.

Infants with non-accidental fractures have a high risk of further abuse, even with intervention. Skellern, Wood, Murphy, & Crawford (2000), for example, found that 26% of children under 12 months presenting with fractures had additional injuries thought to be due to abuse. The group of infants who were at greatest risk was those less than four months of age. About a third of the children suspected of non-accidental fractures had subsequent and sometimes multiple substantiated child abuse. Another study (Hoskote et al., 2003) found that for infants with fractures, there was a 25% chance that the fracture was due to abuse.

Pattern of Injury

Fractures caused by abuse can appear in any part of the body (Adamsbaum, Mejean, Merzoug, & Rey-Salmon, 2010; Kemp et al., 2008). An injury pattern that includes multiple fractures (without a history of major trauma) in various stages of healing is suspicious (Hoskote et al., 2003; Kocher & Kasser, 2000). “Age-different” injuries not only provide suspicion of abuse, but also suggest repetitive violence and suggest that the child is at risk for further injury (Adamsbaum et al.).

Kemp et al. (2008) systematically reviewed all published studies of fractures. They found that in the absence of a confirmed accidental injury, rib fractures had the highest probability (71%) of being caused by abuse. Given the relative elasticity of the pediatric skeleton, rib fractures are uncommon. Over a six-year time period, Barsness et al. (2003) studied all children at a Level 1 pediatric trauma hospital with a chest film, rib series, or trauma series where a rib fracture was identified. Over the six-year study period, there were 3,758 trauma evaluations and 336 rib fractures in 78 of the children (only 2% of children had rib fractures). The 62 children under age 3 with rib fractures had 316 or 94% of the rib fractures. Of these 62 children, 51 (82.3%) were identified as victims of abuse. The authors state that the rib fractures had a positive predictive value of 95% for all young children. For children younger than 3 years of age, the identification of any rib fracture suggests non-accidental trauma.

Fractures of long bones in non-ambulatory children are commonly the result of inflicted injury (Spencer, 2002). Taitz et al. (2004) maintain that abusive long-bone fractures are almost always limited to children under age three. According to these authors, 80% of abusive fractures are found in children less than 18 months, while only 2% of accidental fractures are found in this age group. Metaphyseal injuries are regularly seen in babies who are shaken by their extremities (arms and legs) (Spencer, 2002). “Metaphyseal injuries are regularly seen in babies whose limbs are twisted and pulled,” adds Dr. Shaw.

Skeletal surveys and bone scintigraphy with follow up radiography can be helpful, especially with younger children (Kemp et al., 2006; Kocher & Kasser, 2000). Either technique alone is likely to miss fractures (Kemp et al., 2006). A follow up skeletal
survey between 10 and 15 days after the initial examination may provide evidence of a healing injury that was not apparent on initial radiographs (Adamsbaum et al., 2010). Adamsbaum et al. further suggest that a complete skeletal survey is mandatory in all cases of suspected abuse in children younger than 2 years. These authors believe that a skeletal survey has little value for children older than five years. Barsness et al. (2003) maintain that adding oblique views to the two standard views increases the sensitivity, specificity, and accuracy of detecting rib fractures in children.

Mechanism of Injury
If there is an explanation inconsistent with the injury or a delay in seeking treatment, the possibility of abuse should be considered (Hoskote et al., 2003; Taitz et al., 2004; Spencer, 2002). An injury that is incompatible with the child’s development or a history of unwitnessed injury should also alert nursing and medical staff to the possibility of abuse. Of particular concern is any long bone fracture in a non-ambulant child (Taitz et al.).

Confusion with Non-accidental Injury
Certain conditions should be eliminated when considering possible inflicted injury of fractures. True accidents, osteogenesis imperfecta, and metabolic bone disease should be ruled out (Kocher & Kasser, 2000) as well as syphilis (Banaszkwicz et al., 2002). These causes of skeletal abnormalities are rare in comparison to physical abuse, but occasionally cause confusion (Banaszkwicz et al.). Dr. Shaw adds that there are many conditions to be considered such as osteomyelitis and deficiencies of substances that contribute to healthy bones such as vitamins and calcium. The expertise of a pediatric radiologist is essential to making these distinctions.

ABDOMINAL INJURIES
Blunt abdominal trauma is a relatively infrequent event accounting for 1.7% to 7.2% of all traumas in children. Abdominal trauma can be associated with significant morbidity and may have mortality rates as high as 8.5% (Saxena, Nance, Lutz & Stafford, 2010). Among physically-abused children, abusive abdominal trauma is the second-leading cause of death (head injury is the leading cause) (Lane, Dubowitz & Langenberg, 2009).

Abusive injury is a significant proportion of cases of blunt trauma abdominal injury to children. One study found that 15.75% of 927 cases of blunt force injury were abusive, second only to motor vehicle accidents (61.27%) and greater than accidental falls (13.59%) (Trokel, Di Scala, Terrin, & Sege, 2004). In a later study (Trokel, Di Scala &
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Terrin, 2006), suspected abuse was 40.5% of the 664 cases of abdominal trauma.

A review of 11,592 consecutive admissions to a pediatric trauma center between 1985 and 1997 found 79 children with injuries to the gastrointestinal tract due to blunt trauma (Canty, Canty & Brown, 1999). Of these 79, there were 15 child abuse victims (19%). None were over 5 years of age and 11 of the 15 were 3 years or younger. The clinical histories were confusing and “full of inconsistencies.” Over half of the children were critically ill and a third of the children were brought well over 24 hours after the injury. Diagnosis was difficult and delayed over four hours for a third. Three of the six deaths (half of the deaths) were from the group of children who were abused. Saxena et al. (2010) also note that children with abusive abdominal injuries have the highest mortality rate of all the causes of abdominal trauma.

Children have poorly developed abdominal muscles and a relatively small abdominal diameter, placing them at increased risk of injury. They are also not as able as adults to protect abdominal areas (Trokel et al., 2004). Children’s organs are comparatively larger than those of adults and thus have more surface area exposed and are at greater risk for injury (Saxena et al., 2010). The spleen is frequently injured in blunt trauma (Potoka, Schall, & Ford, 2002). Liver injuries are a significant cause of death as well (Hackam et al., 2002).

Injury to abdominal organs can be difficult to diagnose because early symptoms are often vague. Even serious injury may be missed (Barnes et al., 2005; Lane et al., 2009; Trokel et al., 2004). Patient outcomes were more severe for abused children than for those with accidental injury and there was a more intense use of hospital resources. One explanation for poorer outcomes in the abused group is a delay in seeking treatment for those children who are abused (Trokel et al.).

Child victims may have additional signs that signal abuse. For example, one study (Trokel et al., 2006) showed a high preva- lence of undernourishment in children who had inflicted abdominal injuries. Wood et al. (2005) found that abuse victims had more severe injuries, were more likely to have multiple injuries, and had a delay in seeking care compared to children with abdominal trauma caused by high-velocity impact. Presentation for medical care occurred within 12 hours for 100% of the high-velocity accident victims, but only 46% of the abuse victims presented for care within that time frame.

However, the authors caution that while delay in seeking care occurs more frequently among caretakers of abused children, delay in seeking care can be found in other groups. For example, in the Wood et al. study, for low-velocity accidents, 65% presented for care within 12 hours, not a significant difference with the abused group where only 46% presented within 12 hours. Interpretations about delay in seeking care should be made after considering all features of the child’s history such as mechanism of injury, age of the child, the severity of the injuries, and the presence of other injuries that are suspicious for abuse.

**ABUSIVE HEAD TRAUMA**

Abusive head trauma, sometimes referred to as ‘shaken baby syndrome’ or as ‘shaken impact syndrome,’ is not a new phenomenon, as damage to children’s brains from abuse has been described at least by the sixteenth century (Wheeler, 2003). It is the most common cause of traumatic death in infancy (Wood et al., 2007). It is also a complex condition and controversies abound.

According to Dr. Michelle Clayton, Assistant Professor of Pediatrics and Child Abuse Pediatrician at Children’s Hospital of The King’s Daughters in Norfolk, Virginia, abusive head trauma from shaking mainly affects children who are 6 weeks to 4 months of age, although the oldest shaken child she has seen is 5 years. Research articles agree and indicate that ‘shaken baby syndrome’ is largely restricted to children under age three (Duhaime et al., 1998). “Shaking is not the only way to inflict brain damage,” notes Dr. Clayton. “The caretaker may throw the child onto a bed, slam the child into something or punch the child.” Researchers agree with Dr. Clayton’s assessment. For example, Kivlin (2001) remarks that shaking alone can cause the entire clinical picture, but the impact injury is often against softer objects such as a mattress and the bruising can be subtle, even requiring shaving of the head to be visible. When a parent pulls a child’s hair or uses the hair to grab a child, the result can be a subgaleal hemorrhage or hematoma of the scalp due to ripping of the veins under the galeal or scalp. There may be petechiae at the site of the pulled hair roots. The scalp may be boggy and acute scalp tenderness may be present. Petechiae over the face and neck can occur from severe retching or coughing, but can also be associated with neck compression associated with strangulation or holding an infant’s neck while shaking (Kos & Shwayder, 2006). Dr. Shaw notes that petechiae often appear over the eyelids if there has been smothering or strangulation.

The most characteristic features of abusive head trauma are subdural hematoma of the brain, brain swelling, retinal hemorrhages, skull fractures, and other fractures such as rib fractures (Kivlin, 2001; Mungan, 2007). Abusive head trauma can be diagnosed by the presence of intracranial bleeding (cerebral edema). The effects, explains Dr. Clayton, are immediate. “Blood vessels are torn and blood gets into the subdural space. If the brain swells enough, it can cut off the blood supply and all or part of the brain can die. The symptoms are variable and can include sleepiness, lethargy, irritability, poor feeding, vomiting, loss of consciousness, seizures, and coma,” she explains.

Retinal hemorrhages are present in about 79% of cases of inflicted trauma, according to Dr. Clayton. Some research studies show that retinal hemorrhages are present in between 65 to 95% of children diagnosed with abusive head injury (Duhaime et al., 1998).

In a study comparing 1997 patients newborn to 4 years of age who were injured by child abuse to a control group of 16,831 patients, retinal hemorrhage was exceedingly more frequent in the child abuse group (27.8%) than in the unintentional injury group (0.07%) (DiScala, Sege, Li, & Reece, 2000). Reece and Sege (2000) report a similar finding with 33% of the abused children showing retinal hemorrhage compared to 2% of the accident group. Bechtel et al. (2004) examined 87 children (15 with abusive injuries and 72 with accidental injury). Retinal hemorrhages were more likely in the group considered abuse (60%) versus 10% in the control group and were more likely to be bilateral (40% versus 1.5%). Thus, while retinal hemorrhages are not necessary for a diagnosis of abusive head trauma, in children under age 3, the presence of extensive bilateral retinal hemorrhages raises a very strong possibility of abuse (Kivlin, 2001; Morad et al., 2002).

There are even cases where neurological manifestations are not apparent immediately. “About a quarter of the children don’t show an immediate effect,” says Dr. Clayton, “but the damage can onset later in conditions such as poor vision or even blindness.” Research suggests that the clinical outcome for victims of abusive head trauma is varied. It can be difficult to assess the neurological outcome of victims at an early stage of development. Effects can range from learning difficulties to cognitive neurological function or death. There can be blindness or visual impairment, paralysis, hearing loss, seizures, and permanent brain damage (Car-
Co-founders Steve Stowe and his wife Kathy created this organization to offer the community education and resources about Shaken Baby Syndrome (SBS). They were inspired by their personal experiences caring for their grandson Jared who was a victim of SBS. Jared suffered severe brain damage on November 20, 2006 at six weeks of age. His father was charged and convicted of child abuse. Jared died on December 11, 2009. He was just three years old. Kathy and Steve Stowe lovingly cared for Jared during his brief life. He required round-the-clock attention for a trachea tube and a feeding tube. Their love for Jared and Jared’s resilience is inspiring. The organization offers trainings who conduct seminars of all sizes. Their website offers many resources for both parents and for professionals.

The major “rule out” is an accidental injury. Keenan et al. (2004) compared characteristics of cases of inflicted traumatic brain injury to cases of non-inflicted injury. They found that children with inflicted injuries were more likely to present with symptoms, a history of trauma was rarely revealed, and retinal hemorrhages and metaphyseal and rib fractures were more common.

Researchers note that no other medical condition fully mimics all the features of shaken-impact syndrome (Duhaime et al., 1998). There is also some controversy about the capacity of pure shaking (as opposed to shaking combined with impact) to cause the injuries (Wolfson, McNally, Clifford, & Vloebberghs, 2005). Biron and Shelton (2005) examined 52 serious cases of abusive head trauma. In 13 of the cases (25%), there was no evidence of impact. For 5 of the 13 cases, the perpetrator stated that the victim was subject to a shaking event. The authors state that their evidence indicates that death or serious impairment can result due to abusive shaking, even when no impact occurs. Dr. Clayton estimates that there are 1,000 to 1,500 cases a year. She adds that the figures may seriously underestimate the actual number of affected children. “Ten to twelve percent of maltreatment deaths each year are due to abusive head trauma.” Dr. Clayton relates that from 2004 to 2008, 98 children under age 4 were hospitalized at Kings’ Daughter’s with this diagnosis. Eighty-four of them were under one year of age.

Researchers have estimated that approximately one in five children less than 24 months of age admitted for head trauma are victims of abusive head injury (Reece & Sege, 2000; Ricci, Giantris, Merriam, Hodge, & Doyle, 2003). The mortality rate is high. Dr. Clayton relates that 12 to 30% of children die from their injuries. Most (25%) die during the initial hospitalization. Medical costs for survivors can be very high. The average costs for the initial hospital stay at Children’s Hospital, says Dr. Clayton, are $44,000 with a range of $18,000 to $70,000. Ongoing costs average $300,000 per child. Incarceration for the perpetrator is close to $25,000 a year.

Although any baby or young child can be at risk, male gender, a history of colic, prematurity, low birth weight, substance exposure in utero, special needs, medical fragility, and poor bonding to the caretaker have been shown to present higher risk (Meskauskas, Beaton, & Meservey, 2009). Additionally, doctors may miss diagnosing cases if the child is very young and from a white, intact family or if the child presents without respiratory compromise or seizures (Jenny, Hymel, Ritzen, Reinert, & Hay, 1999).

Although anyone can shake a baby, some identified risk factors for perpetrators are males (especially biological fathers, mothers’ boyfriends, and stepfathers) who are young (under 30), who are under stress such as lack of employment, who have poor impulse control and who lack understanding of infant development. The incidents occur when a caretaker becomes frustrated, overwhelmed, or angry and some incidents may be triggered by inescapable crying (Carbaugh, 2004; Meskauskas et al., 2009; Rejnved, 2004).

A number of researchers have investigated the crying pattern of babies. There is some thought that an infant’s distress crying might trigger a frustrated, abusive response from immature parents. Crying apparently occurs in an “n-shaped” curve starting at 2-3 weeks, continued on page 10.
building to a clear peak, and then declining by 36 weeks of age. The usual crying curve peaks at 5-6 weeks. In contrast, the peak of “shaken baby syndrome” hospitalizations occur at 10-13 weeks (Barr, Trent, & Cross, 2006). The authors note numerous explanations for the lag, including the possibility of repeat incidences of shaking.

In addition to the “peak” pattern, crying can have other properties that can contribute to caregiver frustration. Colic syndrome includes prolonged, inconsolable crying bouts that occur unexpectedly, seemingly unrelated to anything in the environment, during which an infant manifests a facial grimace, increased motor tone, curling the legs over the abdomen. These bouts tend to cluster in the late afternoon and evening hours. Although the bouts comprise less than 10% of overall crying, they are specific to the first few months of life. A campaign “The Period of Purple Crying” (see separate feature, this issue) was developed by the National Center on Shaken Baby Syndrome as an evidence-based prevention program to help parents cope with crying and to avoid shaking or other destructive responses. For example, Barr et al. (2009a, 2009b) found that use of the PURPLE materials yielded statistically significant improvement on 2 knowledge scales and 2 behavioral scales in a controlled study using 2,738 mothers of newborns.

Showers (2001) notes that although crying is the most commonly reported precipitating event for shaking, other child behaviors such as toilet training problems, feeding difficulties, and children interrupting adults have been associated with shaking episodes. Showers suggests education efforts be targeted to middle and high schools (when youth begin to babysit); to prenatal classes, to offices of obstetricians, to birthing units, and during post-natal visits and parenting classes, as well as to the general public.

Some communities have developed a prevention plan, such as the one in Central Massachusetts in response to six tragedies (Meskauskas et al., 2009) or Virginia’s Campaign started by Steve and Kathy Stowe whose grandchild Jared died at age three from shaken baby syndrome (see separate article, this issue). These campaigns are making inroads to educating parents and the general public. Such education is sorely needed given the lag between shaking episodes and recognition of associated conditions. Prevention programs such as the one in Central Massachusetts in response to six tragedies (Meskauskas et al., 2009)也好, Virginia’s Campaign started by Steve and Kathy Stowe whose grandchild Jared died at age three from shaken baby syndrome (see separate article, this issue). These campaigns are making inroads to educating parents and the general public. Such education is sorely needed given the lag between shaking episodes and recognition of associated conditions. Prevention programs such as the one in Central Massachusetts in response to six tragedies (Meskauskas et al., 2009) or Virginia’s Campaign started by Steve and Kathy Stowe whose grandchild Jared died at age three from shaken baby syndrome (see separate issue). These campaigns are making inroads to educating parents and the general public. Such education is sorely needed given the lag between shaking episodes and recognition of associated conditions. Similar programs are receiving inroads to educating parents and the general public. Such education is sorely needed given the lag between shaking episodes and recognition of associated conditions. Similar programs are receiving support and resources through organizations such as the Prevent Abuse and Neglect through Dental Awareness (PANDA) Program, which began the program in 1992. PANDA programs are available in 44 states and 7 countries. The programs are suitable for the entire dental team, physicians, nurses, day care workers, teachers, advocates and others who care about the prevention of family violence and child abuse.

Cases involving physical abuse often involve injuries to the head, neck, or mouth, and are easily visible to a dentist. However, dentists have a very low rate of reporting suspected child abuse (Mouden, 1998). Studies indicate that dentists are nearly five times more likely to report suspicions of maltreatment if they have been trained. The PANDA program offers training and support to dentists. Dentists can check with their state dental association for their state contact information.
needed, as research suggests that approximately half of Americans do not know about the devastating risks to infants and children from shaking (Russell & Britner, 2006).

**FACIAL AND INTRA-ORAL TRAUMA**

Facial and intra-oral trauma has been present in up to 49% of infants and 38% of toddlers who have been victims of physical abuse. Injuries are widely distributed to the lips, gums, tongue and palate, and include fractures, bruising, lacerations, and bites (Maguire et al., 2007).

Oral injuries may be inflicted with instruments such as eating utensils or a bottle while feeding an infant. Injuries often occur as a result of rough feeding and cramming a bottle forcefully into an infant’s mouth. Injuries to the mouth can also be caused by hands, fingers, scalding liquids, hot foods, or caustic substances. Methods of abuse can include gagging, gripping, violent rubbing or a direct blow to the upper lip. The abuse may result in contusions, burns, or lacerations of the tongue, lips, palate, or frenum. There can be damage to or loss of teeth. Facial bones or the jaw can be fractured. According to a review by Ermerctcan & Ertan (2010), lips are the most common area of injury. A review by Maguire et al. (2006) agrees. The oral cavity is also a frequent site for sexual abuse of children and often causes damage to the junction of the hard and soft palate (Kos & Shwayer, 2006).

Dental neglect is defined by the American Academy of Pediatric Dentistry as a willful failure of the parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate functioning and freedom from pain and infection (Kellogg et al., 2005). Dental caries, periodontal diseases and other oral conditions, if left untreated, can lead to pain, infections, and loss of function that can adversely affect learning, communication, nutrition and normal growth and development. According to Kellogg et al., the point where neglect can be considered is when the parent has been properly alerted about the child’s condition and the treatment needed and how to access treatment. If the parents failed to obtain the needed care, despite efforts and assistance in to providing access to dental care, then the case should be reported to CPS.

The Prevent Abuse and Neglect Through Dental Awareness (also known as PANDA) coalition is a resource for dentists. See the spotlight, this issue. Pediatric dentists are well-positioned to detect physical abuse, according to articles by Cairns, Mok, and Welsbury (2005) and by Nuzzolese et al., (2009). In a review of 750 records of children who were physically abused, 59% of the children had signs of physical abuse on the head, face, or neck, signs that would have been easily visible to a dental practitioner.

Injuries inflicted by mouth and teeth may leave clues regarding the timing and nature of the injury as well as the identity of the perpetrator. Kellogg et al. (2005) notes that the oral cavity is a frequent site of sexual abuse of children, and adds that specialized hospitals and clinics equipped with protocols and experienced staff are best suited for colleting evidence of a sexual assault. Maguire et al. (2005) note that many of the intra-oral injuries described in abused children are likely to be seen by general dental practitioners, yet dentists make very few child protection referrals. Once suspected abuse is detected, forensic dentists can be helpful.

**SEXUAL ABUSE**

Sexual abuse affects both genders of children, all ages, and all socioeconomic levels. The collection of forensic evidence is essential to assist law enforcement and child protective services with the investigation, with prosecuting the offender, and with providing safety to the child (Cronch, Viljoen, & Hansen, 2005; Ferguson, 2006; Walsh, Cross, & Jones, 2007). The primary focus of Emergency Departments is to screen for injuries and medical conditions and to initiate medical treatment (Matkins & Jordan, 2009). A third component is to reassure victims and parents about the child’s physical well-being (Walsh et al., 2007).

Children evaluated by pediatrics or emergency room staff should be referred for a formal forensic interview by CPS, law enforcement, or a Child Advocacy Center (Matkins & Jordan, 2009). The evaluation of sexual abuse requires a multidisciplinary effort, and the medical evaluation is only one part. Sexual abuse is only rarely diagnosed primarily on the basis of a medical exam or lab findings (Kellogg et al., 2005).

Sexual abuse often has no accompanying physical signs. According to Adams et al. (2007; Adams, 2008), only a small percentage of children evaluated for suspected sexual abuse have signs of genital or anal injury at the time of the evaluation. There are several reasons proposed for absence of acute injuries. One possibility is that no injury was sustained due to the nature of the sexual contact (touching; fondling; oral-genital contact). It is also possible that the sexual contact involved penetration of tissues that stretched without injury. Finally, the contact may have caused injury that healed prior to the time that the child is examined.

Some signs of possible sexual abuse include:
* The presence of semen or sperm;
* Pregnancy;
* Evidence of Chlamydia, gonorrhea, syphilis or genital warts in the absence of perinatal transmission;
* HIV infection not perinatally acquired or acquired through blood transmission;
* Clear evidence of penetration without accidental explanation;
* Recurrent urinary tract infections.

There are several possible situations which might cause a child or adolescent to be in the Emergency Department for evaluation of alleged sexual abuse. It may be a disclosure by the child or youth; the evaluation may be at the request of law enforcement or CPS; a caregiver or parent may have brought the children due a suspicion of abuse due to behavioral or physical symptoms; or the sexual abuse may have been discovered while examining the child for a related complaint (Kellogg et al., 2005; Matkins & Jordan, 2009). While evaluation by a specialist is desirable, the child presenting at the ED must, at minimum, receive a medical screening to determine whether or not an emergency medical condition exists that requires treatment. Situations that would require immediate attention include: children in acute pain or bleeding; those who are in psychological crisis; those who might be pregnant; and children whose safety cannot be assured after discharge (Matkins & Jordan).

There are a number of conditions to consider when evaluating possible sexual abuse. Accidental trauma, a variety of dermatologic conditions, and normal congenital variations can be confused with abuse (Ermerctcan & Ertan, 2010). Matkins and Jordan (2009) list 18 medical conditions that can mimic sexual abuse in children and adolescents.

Most states have developed standardized examination kits that offer comprehensive instructions for systematic specimen collection, documentation, and proper chain of custody evidence requirements (Houmes, Fagen, & Quintana, 2003). Guidelines by professional groups are reviewed elsewhere in this issue.

A thorough medical history is crucial. Information should be gathered from parents and caretakers as well as from the child about incidents of past physical abuse and sexual activity. Adolescents need to be asked about consensual sexual contact as well as forced contacts and the timing of each. Children and adolescents should be interviewed alone, if possible (Adams et al., 2007; Kellogg et al., 2005). Both the American Academy of Child and Adolescent Psychiatry and the American Professional Society on the Abuse of Children have published guidelines for interviewing children where sexual abuse is suspected.

Special examination techniques have been assessed. According to Atabaki and Paradise (1999), Colposcopic examination can be a helpful adjunct, but is not an obligatory procedure. A Foley catheter may facilitate identification of significant physical findings (Atabaki & Paradise, 1999; Adams et al., 2007). A Wood’s lamp illumination can identify suspicious areas or specimens that require more definitive forensic testing (Atabaki & Paradise). Signs of trauma should

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FACTITIOUS DISORDER BY PROXY/MUCHAUSEN SYNDROME BY PROXY (MSBP)

Munchausen is a condition used to describe situations where an adult feigns symptoms or deliberately causes symptoms in order to assume a patient role. The complaints are so convincing that the individual is subject to needless hospitalizations, laboratory tests, and even surgery (Stirling, 2007). Munchausen is distinguished from malingering (where symptoms are also produced intentionally) as malingerers have a specific goal (such as obtaining disability payments or avoiding military service).

Munchausen Syndrome is also known by the name Factitious Disorder. Recently, the American Professional Society on the Abuse of Children has recommended that a child who is victim of this abuse be diagnosed with “pediatric condition falsification” (PCF) and the diagnosis of Factitious Disorder by Proxy (FPD) be reserved for the caretaker who causes the abuse (Shaw et al., 2008).

Munchausen Syndrome by Proxy or Factitious Disorder by Proxy refers to situations where an adult falsifies symptoms in a child or deliberately causes symptoms or a disease in a child. The parent, typically the mother, fabricates symptoms and medical history because she enjoys the attention and solace she receives from having a child with puzzling symptoms. MSBP was coined in 1977 by British pediatrician Roy Meadow when he described two cases where the apparent symptoms of Munchausen Syndrome were documented by photographs (Kellogg et al., 2005).

The need for testing for STDs varies according to the child’s age and other circumstances. Since the prevalence of STDs is low (about 5%), especially in pre-pubertal children, some authors suggest only testing children with specific risk factors (Adams et al., 2007; Atabaki & Paradise, 1999; Kellogg et al., 2005). These risk factors include signs or symptoms suggestive of a STD; a family member or sibling with a STD; an abuser with risk factors for an STD; concerns of the child or family; prevalence of STDs in the community. The most prevalent STDs in sexually abused children are Chlamydia infections, genital warts, and gonorrhea (Atabaki & Paradise).

Research indicates that suspected sexual abuse victims seen at CACs were twice as likely to have a forensic medical evaluation compared to children seen in comparison communities. When no penetration was reported, children seen at CACs were four times more likely to receive examinations compared to children in comparison communities (Walsh et al., 2007). Another group of specialists are the SANE (Sexual Assault Nurse Examiner) program, first established in 1976 (Houmes et al., 2002).
entation was false apnea/seizures with the father present and involved in the resuscitation. All but two fathers were living with their partner. In four homes dogs or cats had died under unusual circumstances. In four homes there had been one or more unusual fires with investigations suggesting that the father set the fire.

There are numerous ways a parent can compromise the child. She may expose her child to toxins, administer inappropriate medications, expose the child to infections, or administer physical trauma, such as smothering. Skin may be burned, dyed, tattooed, lacerated or punctured to simulate skin conditions. Infectious agents can be administered into any orifice. If the child is hospitalized and has intravenous lines, these can be used to introduce toxins or to contaminate the child with foreign blood or urine (Ermeratc & Ertan, 2010). Parents have been known to alter laboratory samples or temperature measurements. Depending upon the parent’s sophistication, a variety of novel or exotic diseases may be simulated, although Apnea and seizures are the two most common manifestations of Munchausen by Proxy (Ermeratc & Ertan, 2010; Shaw et al., 2008) and the most common practices appear to be suffocation and poisoning with medications (Shaw et al., 2008) along with falsification of laboratory specimens.

Criddle (2010) divides the methods for inducing illness into four categories: poisoning; bleeding; infections; and injuries. A wide variety of poisons, including Ipecac, salt, and insulin have been documented. Bleeding can be induced. To produce an infection, fecal matter can be added to wounds, urine can be injected into a child or a catheter, or dirt, coffee grounds, or other contaminants can be applied. Injuries include suffocation and wounds that are not allowed to heal. Although there is no typical presentation, the abuser almost always describes signs and symptoms undetectable to the medical practitioner.

There are high recidivism and mortality rates (Criddle, 2010; Hettler, 2002). According to Galvin et al. (2005), overall mortality has been reported as 6 to 10% but may actually be as high as 33% when suffocation or poisoning is involved. Siblings are also at high risk. For that reason, children should be reintroduced back into the home only cautiously under appropriate medical and legal supervision (Davis et al., 1998; Hettler, 2002). Harm to siblings is also possible (Davis et al.).

A study in the UK and Wales (Davis et al., 1998) investigated the risk of further abuse in MSBP (96 cases), non-accidental poisonings (39 cases), and non-accidental suffocation (28 cases). Researchers found that the risk of re-abuse remained high if the children were unprotected. The highest risk was for children experiencing suffocation (50% had siblings with the likelihood of prior abuse, some fatal) and the lowest risk was for MSBP cases where there had been no physical harm (17% re-abused). For those with non-accidental poisoning, 40% had siblings where there was the likelihood of prior abuse, some fatal. Of the 111 families with a two-year follow up, 75 families had 145 surviving siblings and ten new siblings born during the follow up phase. Twenty percent of the recently-born children had been abused and fourteen older siblings in nine families (14%) had been abused. McGuire and Feldman (1989) add that even if protection from further physical injury can be achieved, severe psychological trauma remains likely. Others (Galvin et al., 2005) make stronger statements, saying that virtually all child victims suffer serious psychological sequelae due to the abuse.

Unlike the typical parent who is frustrated and hurts a child, the parent with MSBP has complex motivations. This parent seeks recognition and positive approval from medical staff concerning their devotion to the child. The parent may refuse to leave the child’s bedside. The parent seeks to appear as devoted to the child. They may be ever-present, appear overly attached and overly attentive, sometimes excluding the nursing staff because the parent is doing the nursing care (Thomas, 2003).

Most perpetrators are female (93%) and many have unfulfilling marriages. Parents are often very knowledgeable about health care conditions through their own training in the field or through internet research (Shaw et al., 2008). Thomas (2003) says that mothers may be jealous of their children’s happy childhood as they lacked maternal attention or love. Their own lack leaves an insatiable need for attention.

Diagnosis of fabricated disorders is difficult. The common factor in delayed diagnosis is failure to consider a factitious disease, even when MSBP is more probable than whatever diagnosis is being pursued. MSBP should be considered whenever a child presents with an unusual illness and has a negative workup or an atypical response to standard therapy (Criddle, 2010; Langer, 2009). The perpetrator may present as uncharacteristically calm in view of the uncertainty of the victim’s diagnosis and treatment, may appear to welcome additional medical tests, praise staff excessively, have an unusually close relationship with staff, have a history themselves of unexplained illnesses, and adamantly refuse to accept the idea that the diagnosis is non-medical (Langer).

A hospitalization or diagnostic separation is suggested as part of the assessment process (Siegel & Fischer, 2001). Covert, in-hospital video has revealed some abuse and has exonerated others. It is thought that 70% of perpetrators will continue the abuse in the hospital, as keeping the child in a sick role is the only way to keep fulfilling the abuser’s needs (Criddle, 2010).

It is worth noting that some question whether MSBP is actually a psychiatric problem (Rosenberg, 2003). Rosenberg argues that there is no medical evidence that the harm to the child, even if self-serving, is necessarily due to psychopathology or mental illness. Nor is it clear how to structure treatment for perpetrators, although intensive and long-term treatment has been recommended (Seigel & Fischer, 2001).

**CONDITIONS THAT MIMIC ABUSE**

Mudd & Findley (2004), Kos & Shwayder (2006), and AlJasser & Al-Khenaizan, (2008) describe some conditions that can mimic physical child abuse. Readers are referred to these articles for a more thorough discussion. A few examples are mentioned below.

Mongolian spots can appear as bruises to an untrained observer (Hornor, 2009). They are primarily seen in Black, Asian, Latino, and Native American babies. The blue-gray areas of pigmentation are commonly located on buttocks, backs, legs, shoulders, and upper arms. They have indistinct borders, do not change rapidly, and lack an inflammatory appearance (Kos & Shwayder, 2006; Mudd & Findley, 2004).

Coagulation disorders such as hemophilia and vitamin K deficiency can present with frequent bruising Likewise leukemia and other childhood cancers such as neuroblastoma can result in bruising easily. Bullous impetigo is an infection that can mimic cigarette burns or scald burns. Erythema multiforme is a hypersensitivity reaction to drugs or infectious agents. Lesions often appear on palms, soles of feet, arms and legs but may arise anywhere including the mouth. Henoch-Schonlein purpura (HSP) are lesions triggered by medication use that are most commonly around the buttocks, arms and legs, although any area of the body can be involved. A skin biopsy may be needed to confirm the diagnosis. Other conditions that can mimic abuse include infections, food and medication reactions, and connective tissue disorders (Kos & Shwayder, 2006; Mudd & Findley, 2004).

Folk remedies can also mimic abuse (Ermeratc & Ertan, 2010; Kos & Shwayder, 2006; Mudd & Findlay, 2004). Cao giao, a Southeast Asian practice commonly called “coin rolling” or “coining” in the United States, is a therapy to rid the body of “bad winds” that are believed to cause fevers. A medicated ointment is applied to the chest and back and a coin, spoon, or other object is used to vigorously rub the skin until petechia appear. The Chinese practice of chueh sah or quat sha, also known as “spooning,” is similar.

Cupping is practiced by Russian and Eastern European families and also those of

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Asian and Mexican-American origin to treat pain, poor appetite, fever, or congestion. A cotton ball is soaked in alcohol and ignited in a cup to create a vacuum. The cup is immediately placed on the skin, causing a round bruise. The practice is done to relieve congestion. Moxibustion, used in Asian cultures, involves burning an herb in an area of the body that needs healing and can appear to be cigarette burns (Ermentcan & Ertan, 2010; Kos & Shwayder, 2006; Mudd & Findlay, 2004).

Many conditions can mimic burns. These include bulbous impetigo, phytophotodermatitis (solar keratoses from plants), and laxative-induced contact dermatitis. Pediatric eczema can also sometimes be confused with inflicted burns (Allasser & Al-Khenaizan, 2008; Heider, Priolo, Hultman, Peck, & Cairns, 2002; Hill Pickford, & Parkhouse, 1997).

Bone fractures are almost always due to trauma, whether accidental or non-accidental. For example, over an entire decade in a Leeds (England) hospital, only one child referred for suspected abuse had multiple fractures due to a genuine bone disease (Wheeler & Hobbs, 1988). Jenny et al. (2006) list several conditions that can mimic abuse and cause fractures: osteogenesis imperfecta; rickets; osteomyelitis; copper deficiency; fractures secondary to demineralization from paralysis; and a number of rare metabolic conditions. Grant, Mata, and Tidewell (2001) cite two cases of non-ambulatory infants sustaining a fracture while playing in an infant play station.

Anal fissures can mimic sexual abuse. They can be associated with constipation or passing large, hard stools. (However, if a child is giving a history of sexual abuse and anal fissures are found, they should be concerning and documented.) Likewise, the diameter of the hymenal opening is not a reliable indicator of sexual abuse (Hornor, 2009). Crohn’s disease may involve any part of the gastrointestinal tract and the perianal region frequently develops fissures, fistulae, and skin tags which, in children, might give rise to the suspicion of sexual abuse (Allasser & Al-Khenaizan, 2008).

The examples above are but a few of the many conditions that can be confused with child abuse, neglect, or sexual abuse. Health care providers from different specialties and pediatricians in particular, must be aware of the possible alternative explanations for injuries or symptoms and take care to consider these possibilities when evaluating children. Readers who would like a more comprehensive article should read “Is It Child Abuse or Something Else?” by Dr. Anthony Shaw, published in Medical Economics, Volume 75, June 15, 1998.

### Failure to Thrive

Failure to thrive (FFT) is a condition in which the child fails to gain the weight or height expected and there is no organic disease to account for the growth failure. FFT in infants and children is caused by inadequate nutrition to maintain physical growth and development. It can lead to impaired growth, deficits in intellectual, social and psychological functioning, and even death (Block et al., 2005; Corbett & Drewett, 2004; Raynor & Rudolf, 1996).

There can be a number of reasons for FFT such as a child’s undemanding behavior, low appetite and poor feeding skills (Wright & Birks, 2000). Other contributing factors can include: breastfeeding difficulties; errors in formula preparation; poor diet selection; and organic diseases (such as cystic fibrosis, cerebral palsy, HIV infection, inborn errors of metabolism, celiac disease, renal disease, lead poisoning, or major cardiac disease). Poverty is the single greatest risk factor for FFT (Block et al., 2005).

FFT can also be related to neglect and in its extreme form can be fatal (Block et al., 2005). FFT is often complex, involving a combination of organic problems, a child who is difficult to feed, and dysfunctional parenting (Block et al., 2005; Raynor & Rudolf, 1996).

When FFT is caused by neglect, certain risk factors are likely to be present (Block et al., 2005). The parent may be an adolescent. The parent may have a history of being a victim of child abuse. There may be inadequate interactional behaviors or less positive affective behavior. The infant may be preterm or low birth weight. The parent and infant may have been separated from each other due to prolonged hospitalization. There may be a lack of extended family to assist with child care. Substance abuse, unemployment, single parenting, and family violence may be present. Parents who are more affluent may be overly involved in career development or lack maturity and emotional strength to nurture an infant. Risk factors may lead to inconsistent feeding patterns with decreased nutrition and growth.

Risk factors may differ for different age ranges. Olsen et al. (2010) examined 6,090 records in the Copenhagen Child Cohort 2000 (9% of children born in Denmark during 2000). They defined weight faltering as the slowest weight gaining 5% of children in the cohort and examined age periods. Weight faltering within the first two weeks after birth was associated with intrauterine growth retardation, female child, single motherhood, and maternal smoking during pregnancy. Between two weeks and four months, weight faltering was associated with serious congenital disorders and serious physical illness as well as deviant mother-child relationships. Later onset weight faltering (onset between 4 and 8 months) was only associated with feeding and sleeping problems. Unlike the earlier onsets, there were no associations with any biological or psychosocial factors. The authors concluded that early onset feeding problems are associated with child-related vulnerability and poor regulatory ability in combination with socio-demo-
graphic risk factors. Feeding and eating problems, FTT or weight faltering that onsets after two months but prior to four months, in contrast, may be related to problematic mother-child relationships and the mother’s deviant handling of the child.

Attachment issues may be an important component to FFT although children may fail to thrive and still show attachment to caretakers. Conversely, children who are poorly attached may still show adequate growth (Block et al., 2005).

The clinical evaluation of possible FFT should include a thorough history, a physical examination, a feeding observation, and laboratory tests. Because early malnutrition can have devastating effects on the developing brain, a diagnosis of FFT should be considered a medical emergency. Traditionally, a hospital setting has been used to monitor and observe the infant and caretakers, but in-home providers or foster care are alternatives (Wright & Talbot, 1996). Above-average weight gain in the hospital or in a foster care setting can support a diagnosis of FFT (Block et al., 2005).

It is not sufficient to return the child to its original environment after weight is sufficient. FFT must be considered to be a chronic condition and interventions should be long-term (Block et al., 2005; Wright & Talbot, 1996).

The deliberate withholding of food, starvation, is considered a rare and severe form of child maltreatment. Kellogg & Lukefahr (2005) describe 12 cases over an 11-year time span. The median age of the children was 2.7 years, although the range was 2 months to 13 years and 7 months. Six of the children survived with younger children at higher risk for death. All survivors had problems with re-feeding and rehabilitation had to be a slow process. In all but one case, other children who were not malnourished lived in the home.

Caretakers of older children justified withholding food for a variety of reasons: corporal punishment was ineffective; the child was difficult to control; the child had an unnatural desire for food; or a perception that the child was evil. None of the infants had seen a physician since birth. Except for one child, all school-aged children were home-schoolked or kept out of school.

Kellogg and Lukefahr conclude that malnutrition can result from lack of knowledge of nutritional needs or formula preparation; mental illness or substance abuse; poverty; breastfeeding difficulties; congenital abnormalities that interfere with feeding; and organic disease. Severe malnutrition affects every organ system, including the brain. Children in this study were wasted and stunted. There are also pronounced psychological and emotional effects, including hoarding and food obsessions.

Supervisory Neglect

Parents, guardians and caretakers are expected to protect children from harm, yet epidemiologic studies confirm that many young children are injured in their own homes. Inadequate supervision is often cited as a contributing cause. Under what circumstances should the pediatrician report a suspicion of supervisory neglect? The American Academy of Pediatrics has issued some advice that is reviewed elsewhere in this issue. While it is never easy to make the decision for a report, AAP guidelines can help doctors make a decision about reporting. When a reasonable suspicion exists that a pattern of caregiver decisions or behaviors have placed a child at significant ongoing risk for physical, emotional, or psychological harm, the incident should be reported.

Examples of supervision neglect include preschool children left unattended or adolescents who are out overnight without parental approval. How often the child is left alone, the safety of the environment, the child’s access to help and how long the child is unsupervised can all be important (Dubowitz et al., 2000).

Drowning

Submersion accidents remain the second-leading cause of death and injury in children ages 1 to 4 years of age (Burford et al., 2005; Habib & Perkin, 2008; Quan & Cummings, 2003) followed by youth ages 15-19 years old (Quan & Cummings). Lack of supervision is associated with drowning deaths in young children (Brenner, 2003; Byard & Donald, 2004). For older youth, about half of drownings are associated with substance use. Adolescents also engage in risky behaviors and over-estimate their swimming abilities (Quan & Cummings). Additional conditions that can be associated with drowning deaths include epilepsy and cardiovascular disorders such as malformations of the heart (Byard & Donald). Epilepsy can increase the risk of drowning 4- to 14-fold (Burford et al., 2005). For children ages 0 to 4 years, most drowning occurs in swimming pools, bath tubs, hot tubs, and buckets (Burford, 2005; Hasibeder, 2003; Quan & Cummings, 2003). Bathtubs are the most common site for intentional, inflicted submersions (Gillenwater, Quan, & Feldman, 1996). Adolescents, in contrast, drown more often in rivers, lakes and canals (Burford et al., 2005).

Although most infant submersion are due to lack of supervision, as many as a third of cases may be due to intentional abuse (studies cited in Habib & Perkin, 2008). Intentional drowning does not have witnesses, and usually occurs in the home. The usual victim is an infant or toddler. Accidental drowning is more likely to involve toddlers or adolescent males and occur in public places such as swimming pools, drainage ditches, lakes or rivers (Griest & Zumwalt, 1989). Non-accidental drowning are more likely to occur at an unusual time of the day and be accompanied by a precipitating crisis, often a domestic dispute. There may be a history of previous abusive behaviors (Griest & Zumwalt).

SUMMARY

It is important for all multidisciplinary team members to appreciate the role of medical team members who serve child victims of maltreatment. Medical staff can be crucial in the detection of child abuse and neglect. They also have a major role in intervention and treatment of child victims and their families. Medical research and technology advancements continue to refine the field. Readers are referred to the medical guidelines reviewed elsewhere in this issue and the voluminous reference materials, some of which are reviewed in this issue.

References are on the Website or Available by Request
Caseworkers Can Promote Injury Prevention

A parent’s overall capacity to parent may be connected to the parent’s ability to protect children from environmental hazards and unintentional injury (Jacobs, 1989). Because the majority of injuries to young children occur in the home, workers who deliver services in the home can be instrumental in reducing the risk of injury for children.

A few suggestions:

- Basic safety equipment (infant car seats/outlet plug protectors/ poison identification labels/ smoke detectors/child-proof medication caps/stairs barriers or gates) can be made available to clients and foster parents.
- Having workers model how to use safety products and help parents feel comfortable with safety practices is effective and efficient as workers are already visiting homes.
- Informational brochures and posters can be displayed in offices and offered as handouts.
- Licensing agency staff can train foster parents and others about injury prevention.
- A safety checklist can allow a worker and a parent to assess together the safety of the home and plan to correct any unsafe conditions found.

A parent’s ability to follow through with worker-suggested safety strategies can provide a measureable indicator of motivation and competence. Weaving injury prevention activities into existing child protective services can save children’s lives.

Sources: Jacobs (1989)

Additional Prevention Resources are on our website!

Back to Sleep Campaign

Eunice Kennedy Shriver
National Institute of Child Health and Human Development (NICHD),
P.O. Box 3006, Rockville, MD 20847, 1-800-370-2943,
Fax: 1-866-760-5947, NICHDInformationResourceCenter@mail.nih.gov
More information at: http://www.nichd.nih.gov/sids/

The Back to Sleep Campaign is a public education campaign dedicated to educating parents and other caregivers about reducing the risk for Sudden Infant Death Syndrome (SIDS). The campaign was named for its recommendation to place babies on their backs to sleep, in order to reduce the risk for SIDS which is sometimes also called “crib death.” The photo on the right shows a baby in a safe sleep environment. If a blanket must be used, place the baby with feet at the end of the crib and make certain the blanket reaches no higher than the baby’s chest. Tuck the ends of the blanket under the crib mattress for safety as shown in the photo. Since the campaign started, the percentage of infants placed on their backs to sleep has increased while the overall rate of SIDS has decreased by over 50%. The sleep strategies recommended in the Back to Sleep publications are based on research findings defined by the AAP Task Force on SIDS.


This article focuses on areas of counseling parents for pediatricians. The article covers areas for which there is sufficient information that attention to the concerns will improve children’s health. For a synopsis of this information and similar information sources, see VCPN, this issue, for the article on Prevention of Childhood Accidents and Injuries, on the website.


Available from: http://pediatrics.aappublications.org

This research study was conducted to propose using visits to emergency departments as an opportunity to educate parents on child safety as a way to prevent child injuries. There have not been any previous studies measuring the relationship between outcomes of educating parents and its effects on the prevention of additional child injuries. The computer program used was called Safety in Seconds. The use of computer technology to educate parents can save time in a busy emergency department. The program focused on the education about car seats, smoke alarms, and poison storage safety.

A total of 901 parents participated in the study. The parents were divided into an intervention group (received a tailored and specific safety report) and a control group (received a generic report on child health topics). After completing Safety in Seconds, the parents were interviewed a few weeks later to determine the amount of child safety information they had retained.

The findings indicate that the Safety in Seconds program significantly improved the parent’s safety knowledge. The parents in the intervention group were significantly more likely to have adjusted to safer behaviors based on the information from the computer program than the control group. The research suggests that the use of computer technology programs in emergency departments can have positive effects on educating parents on child safety.


Safe Kids USA is a coalition network for more than 600 groups in all 50 states that work with families to provide a safe environment for their children. They compile information from health and safety experts, educators, corporations, foundations, governments and volunteers to educate families. Their goals include: teaching families about child injury risks and prevention, encouraging and conducting research on leading injury risks, evaluating solutions for injury risks, working to pass and improve child safety laws and regulations, providing lifesaving devices such as child safety seats, helmets, and smoke alarms to families who need them, and promoting corporate leadership in child safety through effective and sustainable partnerships.


The World Report on Child Injury Prevention is aimed at policy makers. It reviews current information about unintentional child injuries and how to prevent them. Their goals include: 1) raising awareness about the magnitude, risk factors and impacts of child injuries globally; 2) drawing attention to the preventability of child injuries and present what is known about the effectiveness of intervention strategies; and 3) making recommendations that can be implemented by all countries to reduce child injuries effectively. Not only does the summary review the leading causes of death among different age groups of children, it also explains in depth about each one, listing risk factors for specific types of injuries as well as how to prevent those injuries.

Sixty percent of all child injury deaths encompass road traffic collisions, drowning, fire-related burns, falls or poisoning. However, the numbers are much higher in lower-income countries than in high-income countries. Until age five there is no gender difference in injury-related fatalities. After this age, boys comprise a larger proportion of deaths. (For ages 15-17, 86% of all unintentional injury fatalities). Other factors that make children vulnerable to injury include age and stage of development, poverty, and environment.

The report also considers approaches that can reduce injury such as: legislation and enforcement; product modification; environmental modification; supportive home visits; promotion of safety devices; education; skills development and behavior change; and community-based projects. The report also provides a useful one-page list of “Proven Interventions for Child Injury Prevention” that focuses on the top fatalities related to child injury. The end of the report lists seven recommendations for action:

• Integrate child injury into a comprehensive approach to child health and development;
• Develop and implement a child injury prevention policy and a plan of action;
• Implement specific actions to prevent and control child injuries;
• Strengthen health systems to address child injuries;
• Enhance the quality and quantity of data for child injury prevention;
• Define priorities for research, and support research on the causes, consequences, costs and prevention of child injuries;
• Raise awareness of and target investments towards child injury prevention.
Think about a young teenage child who is at risk for high cholesterol, high blood pressure, type-II diabetes, cancer, orthopedic problems, abnormal glucose tolerance, asthma, sleep apnea, deteriorating brain tissue, coronary heart disease, gall bladder disease, osteoarthritis, hypertension, stroke, and other medical conditions. Then consider that the child’s parent could have prevented or at least minimized the risk of contracting these life-threatening conditions. The problem causing the risks is morbid childhood obesity (Centers for Disease Control, 2010; Sciarani, 2010).

Consider the case of a three-year-old so obese that she can hardly move. Almost three times the weight of a normal three-year-old, this child weighs 100 pounds more than the average child. If the parents disregard medical advice and the child dies, who is responsible? This case is factual, fortunately, the state intervened before the child died (Patel, 2005).

In May of 2009, the South Carolina Department of Social Services intervened and took a child who weighed 555 pounds into state custody in order to treat his morbid obesity. Additionally, his mother was charged with criminal neglect after she fled and failed to appear in court (Barnett, 2009).

Morbid obesity is becoming more frequent and is affecting children at a younger age (Patel, 2005; Alexander, Baur, Magnuson, & Tobin, 2009). Obesity is typically defined as being more than 20% overweight (equal to or greater than the 95th percentile). Morbid obesity is defined as weighing more than twice the normal weight (Patel, 2005).

Health experts use the body mass index (BMI) to categorize levels of obesity. BMI is a person’s weight in kilograms divided by his height in meters squared. It is relatively easy to obtain the height and weight measurements needed to calculate BMI and the measurements are noninvasive. BMI measures body fat and the measure applies to both men and women. A BMI between 25 and 29.9 is considered overweight and a BMI of 30 or greater is obese. A BMI greater than 39 is considered morbidly obese.

The risk of mortality is linked to BMI (Franks et al., 2010). People with a BMI of 30 or greater face a 50-100% higher mortality rate from all causes compared to individuals of normal weight. The higher the person’s BMI, the greater the risk of adult-onset diabetes, hypertension, stroke, and other diseases. Obesity-related disease kills 400,000 Americans each year – more than AIDS and tobacco-related cancers combined.

Between 1988 and 2008, the prevalence of obesity in children tripled (Ogden et al., 2010). The dramatic increase of morbid childhood obesity is cause for concern. The fatal conditions associated with untreated morbid obesity continue through adulthood. Obese children have an 80% chance of becoming an obese adult (Coutney, 2006, cited in Sciarani, 2010). A child who is overweight after age four is likely to remain that way (Hill & Trowbridge, 2006; studies cited in Patel, 2005). Obese adults face increased risk of diabetes, cardiovascular disease, and many other chronic conditions (Hill & Trowbridge).

Even before reaching adulthood, overweight and obese children are already experiencing medical and psychosocial effects related to their overweight condition. Pediatricians are seeing increasing numbers of children with hypertension, dyslipidemia, and noninsulin-dependent diabetes mellitus. The costs to the health care system are enormous, estimated at 8% of total health care costs (Hill & Trowbridge, 2006). Morbidly obese children are at risk for liver problems, sleep apnea, coronary artery disease, and pediatric hypertension. Social discrimination, poor self-esteem, and depression are additional likely consequences. The most severe outcome is premature death (Patel, 2005).

Varness, Allen, Carrel, and Fost (2009) note that obesity, even morbid obesity, has a spectrum of risk. These authors divide children into four groups: Group 1 are obese children who have not yet developed any co-morbid conditions. Group 2 are children who have co-morbid conditions that predict serious harm, but the conditions are reversible in adulthood. An example is impaired glucose tolerance. Group 3 are obese children who have co-morbid conditions that predict serious harm and the conditions are not reversible in adulthood (such as advanced hepatic fibrosis). Group 4 children are obese and have co-morbid conditions that constitute serious imminent harm in childhood. These conditions include severe obstructive sleep apnea with cardio-respiratory compromise, uncontrolled type 2 diabetes, and advanced fatty liver disease with cirrhosis. They suggest that reference to these categories may be helpful to decision-makers considering removal of children from their homes due to morbid obesity. The authors feel that the state is not justified in removing Group 1 children. For children in Group 4, charges of medical neglect can be warranted if in-home approaches and alternatives have been tried and failed. Removal may be necessary in order to provide the necessary medical and lifestyle treatments. The middle two groups pose more difficult decisions, state the authors, with more justification for Group 3 children.

Various factors contribute to childhood obesity. The most common contributor is an imbalance between the amount of energy consumed and the amount expended (Smith & Liang, 2005). Snacking can account for up to 27% of children’s daily caloric intake and some children snack continually throughout the day. Children are not participating in physical activity to counterbalance the caloric intake (studies cited in Sciarani, 2010). Unhealthy diets, the easy availability of sugar and processed foods, the growth of video games, and an increase in portion sizes have all contributed to weight gain. Genetics, metabolic disorders, and rare conditions may contribute to some children’s weight gain. Still, genetic makeup has not changed in the last 30 years, while obesity rates among school children have tripled during that time period (Patel, 2005; Sciarani, 2010).

The risk for childhood obesity is not uniform. Overweight prevalence is higher in boys (32.7%) than girls (27.8%), although the prevalence is similar for adolescents of both sexes (30.5% versus 30.2%) (Centers for Disease Control, 2010). Children whose parents are obese, African-American children (especially girls), Hispanic boys, children with single mothers, children with mothers who did not complete high school and children raised in low-income homes or with nonworking parents are at greater risk of becoming obese (Ogden et al., 2010; Patel, 2005; studies cited in Sciarani, 2010;
Straus & Knight, 1999). Straus & Knight (1999) believe that two factors (having a low family income and lower cognitive stimulation) are the main determinants and other associations are mediated by these. These authors maintain that the home environment is a critical factor in the development of childhood obesity. Children raised in environments with low and average cognitive stimulation had a 2.3- to 2.7-fold increased risk of developing obesity. There was no association between obesity and emotional stimulation, however. Children who became obese were equally likely to be hugged, kissed, or spanked compared to children who did not develop obesity.

Morbid obesity does not happen overnight. Parents of the child allow over-indulgence in unhealthy foods. They fail to monitor the types of food they purchase, fail to limit children’s time with electronic media, and fail to ensure that their child has outside physical activity. Failing to regulate food and exercise causes foreseeable injury to the child in the form of weight gain and places the child at risk of harm. Parents are either unaware or choose to ignore the health risks (Patel, 2005). Alexander et al. (2009) also note concerns about parent limit-setting and impaired parent-child interactions (including feeding behaviors).

Given the number of children who might potentially benefit from state intervention, what criteria should guide workers in making a child neglect determination? Courts in California, Iowa, Indiana, New Mexico, New York, Pennsylvania, and Texas have all addressed this issue and with the exception of California, all interpreted morbid childhood obesity as a condition that could be addressed within their neglect statutes (Darwin, 2008).

Statutes define neglect as improper parental care and a parent’s unwillingness or inability to provide a child with a minimal degree of care. Courts have flexibility in interpreting the statutes. According to Sciarani (2010), protective services in the United States have addressed morbid obesity only when the condition has threatened a child’s life. Courts have become involved when Body Mass indexes are well above the 95th percentile, such as when a three-year-old weighed 131 pounds or a 13-year-old weighing 680 pounds. In these situations, the courts generally cooperated with the families to develop a treatment program for the affected child. Only when the parents failed to follow the program were they charged with neglect and/or the child was removed from the home.

Opponents of state intervention cite the considerable risks to children, the occasional death of morbidly obese children, and the expense of health-related problems these children encounter. Proponents do not see a difference in intervention for morbid obesity versus intervention for other medical conditions that are ignored and untreated by the parent.

Alexander et al. (2009) liken cases of severe obesity to cases of failure to thrive. Decisions to refer to CPS are similar, they maintain, based on the health of the child, the failure of health services support, and where the child’s ability to improve weight status has been demonstrated through improvements after hospitalization. Varness, Allen, Carrel, and Fost, 2009 also offer guidelines for removal of morbidly obese children from their homes. They argue that removal is justified when all 3 of the following conditions are present: 1) a high likelihood of serious, imminent harm; 2) a reasonable likelihood that state intervention will result in effective treatment; 3) the absence of alternative options for addressing the problems. These authors state that it is not the weight of the child per se but the presence of co-morbid conditions that is critical.

State intervention in cases of morbid obesity has been initiated on the basis of medical neglect. Parents are responsible to manage medical conditions and follow guidance from medical staff so that the condition can be reversed or improved. Is there also an association between obesity and physical abuse, psychological abuse, or general neglect? An initial evaluation of this question was undertaken by Whitaker, Phillips, Orzol, and Burdette (2007). They obtained data on a cohort of 4,898 children born between 1998 and 2000 in 20 US cities. At three years of age, 2,412 of these children’s heights and weights were assessed and their mothers completed a Parent-Child Conflict Tactis Scale that included items about neglect, corporal punishment, and psychological aggression. Eighteen percent of the children were obese and the prevalence of any incidence of neglect, corporal punishment, or psychological aggression was 11%, 84% and 95% respectively. After controlling for income, number of children in the household, the mother’s race/ethnicity, education, marital status, body mass index, prenatal smoking, and age, and after controlling for the child’s age and birth weight, the researchers found that the odds of obesity were increased by 50% for children who had experienced neglect. There was no association for corporal punishment or psychological aggression.

What remedies are available to courts that have made a determination of neglect? Intensive in-home services can provide education about nutrition, help with meal planning and preparation, assist with an exercise plan, and arrange family counseling. An in-home worker can help refer the family to needed services, provide transportation to medical appointments, and acquaint the family with recreational outlets. Parents may need help with their own weight problems, as the majority of obese children have obese parents (Darwin, 2008).

If the child’s condition allows for the pursuit of alternatives, there is general agreement that efforts should be made to allow the child to remain in the home. Reasonable efforts to keep the child in the family according to the Child Welfare League of America (Darwin, 2008) include family counseling; education about nutrition and exercise; income supports; menu planning; a visiting nurse; and a visiting homemaker. A physician, dietician or similar professional should plan the children’s menus. Having someone to help the parent learn to cook and provide alternatives not high in fat, as well as to monitor compliance with portion sizes, may offer the practical assistance for lifestyle changes that are or at least appear to be drastic.

The assessment and management of severe obesity in childhood is generally acknowledged to be complex. A family-based approach is required, with a dedicated team of multidisciplinary professionals including dietetic, physiotherapy, exercise science, nursing, and psychotherapy as well as social work and medical professionals (Alexander et al., 2009). Assessment is needed on the nature and origins of the caloric imbalance that has led to the obesity. Analysis is needed of the factors contributing to high caloric intake and low caloric expenditure (Christoffel & Forsyth, 1989).

Despite obesity having strong genetic components, the genetic composition of populations change slowly, thus, the large increase in the prevalence of childhood obesity over the past two decades reflects changes in non-genetic factors. Increases in high-fat and energy dense foods and declines in physical activity are two of the major environmental factors that contribute
Childhood Obesity: A CPS Matter?

continued from page 19

to the current epidemic (Hill & Trowbridge, 2006).

Prevention of obesity requires education and installation of positive dietary and exercise habits. Prevention efforts also require information on how parents perceive child feeding and increased knowledge of how parents feed children (as opposed to what they feed). A key appears to be helping children self-regulate so that when they are in situations where food is plentiful, they do not over-eat.

Maternal obesity is the most significant predictor of childhood obesity (Straus & Knight, 1999). Parents with good dietary awareness are more likely to make healthy food choices for their children, including higher fruit and fiber intake and lower fat intake (Clark, Goyder, Bissell, Blank, & Peters, 2007).

Child protective services interventions regarding childhood obesity are limited to extreme situations. However, workers and foster parents need education about prevention of obesity so that they can help instill positive habits in the children and families they serve. Efforts by workers can complement local, state, and national initiatives to promote healthy diets.

References Available on the Website or by Request

DID YOU KNOW THAT...

Fireworks-related injuries are high with 2,304 children under age 15 suffering from one in 2006.

Fireworks injuries can be subdivided into firecrackers (the greatest number of injuries at 1,300), sparklers (1,000 injuries), and rockets (800 injuries). Children ages 5 to 14 are the highest risk for fireworks-related injuries while children age 4 and younger are at highest risk for sparkler-related injury (Safe Kids U.S.A.)

More information is available on the VCPN website! Check the article on Prevention of Injuries and Death of Children and Youth.