

CHAPTER 34

INJURIES FROM CHILD ABUSE

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Introduction

Child abuse and neglect can be broadly defined as the maltreatment of children by parents, guardians, or other caretakers. The main responsibilities of all health care workers (HCWs) are the detection, treatment, and reporting of child abuse. Contrary to common belief, child abuse is not a new phenomenon. Many reports indicate that child abuse has been around since early times and is present in all cultures. The child is weak, vulnerable, and an easy target for abuse. The smaller the child, the greater the danger of abuse and the higher the risk for fatal outcome.

Children in low-income countries are particularly vulnerable to death from abuse. Africa has the highest rates of homicide for children younger than 5 years of age, at 17.9 per 100,000 for boys and 12.7 per 100,000 for girls—more than six times the incidence in Western countries.¹ The magnitude of the problem is obscured by differing legal and cultural definitions of abuse and poor reporting and recording of cases.

Definition of Child Abuse

In Africa, child-rearing practices often vary from those in Western countries; therefore, caution is needed in determining what constitutes abuse or neglect. For example, some cultures accept male as well as female circumcision, but others might consider it as clear child abuse. A useful approach is one that defines child abuse as *abuse to an extent that is not acceptable in a particular culture*. However, this can easily lead to problems. According to the World Health Organization (WHO), “child abuse or maltreatment constitutes all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child’s health, survival, development or dignity in the context of a relationship of responsibility, trust or power”.²

Health Care Workers’ Roles in Child Abuse

The roles of health care workers are to:

- recognise child abuse;
- accurately document the extent of the clinical findings (physical or psychological);
- provide appropriate treatment of the injuries sustained; and
- report the case to the appropriate authorities.

Treatment might vary from analgesics to extensive surgical procedures and placement in institutions. Besides medical treatment for the child, support for the patient and family should be provided. The majority of parents have normal human feelings (i.e., they are not mentally ill), so they might be loaded with guilt. To take an adequate history can be very complicated, as the parents or caregivers are often in an excited and anxious state.

It might be very difficult to establish whether the injury was accidental or nonaccidental. However, the role of the physician is to provide accurate diagnosis and not to play detective. The diagnosis might be very difficult, but the following circumstances should raise the suspicion of child abuse:

- unexplained injuries;
- discrepant histories;
- delay in seeking medical care;
- alleged self-inflicted injury;
- alleged third-party–inflicted injury;
- repeated injuries;
- sexualised behaviour; or
- sexually transmitted disease (STD).

Types of Child Abuse

There are several types of child abuse, as outlined here.

1. *Physical abuse* or nonaccidental injury denotes injuries inflicted by the caretaker.
2. *Child sexual abuse* is the use of a child for sexual gratification. Note that this is a broader term than child rape. Besides sexual intercourse it also includes:
 - touching, fondling, or other inappropriate contact with the child’s genitals or breasts;
 - masturbation of a child by an adult or vice versa and masturbation of an adult in the presence of a child;
 - body contact with adult genitals;
 - exhibitionism; and
 - pornography, including photography and erotic talk.

Of note, most of these abuse acts will leave no physical signs on the victim.

1. *Failure to thrive* due to nutritional deprivation most commonly occurs within the first 2 years of life. Approximately 50% of all failure to thrive in this age category is due to maternal neglect.
2. *Intentional drugging* or poisoning takes place when parents give the child a prescribed drug that is harmful and not intended for children.
3. *Medical care neglect* occurs when a child suffers from a (chronic) disease and the condition worsens due to parental neglect of the condition. Children are completely dependent on their parents for medical care.
4. *Safety neglect* is present when there is a gross lack of supervision, especially in younger children.
5. *Emotional abuse* may occur when the child is repeatedly blamed for incidents or rejected by parents and/or caregivers. Severe verbal abuse and berating are common. This is a difficult condition to prove.
6. *Organised abuse* is a form of organised crime, and often involves multiple victims and perpetrators. The so-called paedophilic and pornographic rings are the major contributors to this group, but there is also cult-based abuse, in which the abuse has spiritual or social objectives.

Physical Abuse

Child abuse is a common cause of childhood death, second only to sudden infant death syndrome (SIDS) in the age group under 6 months. The average age of the abused child is 7 years old; the average age of fatality is 3 years. Socioeconomic problems often play a role. Although culture or socioeconomic status may be associated with child abuse, many studies indicate that abuse occurs among all income categories and all cultures.³ The smaller the child, the bigger the risk. Younger children are at greatest risk because they are more demanding, defenseless, and nonverbal. One-third of physical abuse takes place under the age of 6 months, another third at 6 months to 3 years of age, and the remaining third above the age of 3 years. At particular risk are male children, those born prematurely, and stepchildren.

Modes of physical abuse can be designated as nonaccidental or accidental. Nonaccidental injuries are events resulting from deliberate actions by individuals against themselves or another victim that intentionally threatens, attempts, or actually inflicts physical harm. Accidental injuries result from unforeseen events that cause an external trauma to the body, without the intent to cause harm.

The exact circumstances surrounding an assault are not always clear, but in some cases, the child is used as a shield for an adult under attack. This so-called *shielding phenomenon* encompasses a large spectrum, from the scenario where the child is injured as an innocent bystander to one in which an adult positions the child in self-defence against an attacker.⁴ Some injuries, such as knife attacks, are particularly suggestive of shielding because it is not likely that anyone would deliberately assault a child with such a weapon.

Causes of Child Abuse and Predisposing Factors

There is often an assumption that parents of abused children are severely psychotic or criminal, but research indicates that more than 90% of the parents have no psychological problems or criminal nature. Instead, they tend to be lonely, unhappy, and angry adults under tremendous stress. Additional stressful factors include a breakdown of family structure, poverty, financial need, unemployment, being a single parent, and substance abuse. There is also a very strong correlation with child abuse of the parents: more than 90% of abusing parents may have been abused during their own childhoods.

Diagnosing Child Abuse

There are many ways to establish a diagnosis of nonaccidental injury in children. The first occurs when the child readily cites a particular adult as the assailant. The complaint should always be taken very seriously, and every case must be thoroughly investigated. Unexplained injury should prompt a consideration of child abuse, particularly when parents are reluctant to explain the nature of the accident. For instance, parents might claim that they “just found the child like that”, or “the child might have fallen down”, or “someone else might have hit the child”. The majority of the parents know to the minute where and when the child was hurt. A discrepant history is also suggestive of child abuse.

The suspicion of child abuse increases when the history provided does not explain the severity of the physical injuries. For instance, a child who fell from a bed and yet is covered with bruises is unlikely to have suffered such injuries from the stated mechanism. Another is a parental claim that the child “bruises so easily”. This history is usually misleading, especially when no new bruises appear during hospitalisation. Claims of self-infliction in children should be treated with suspicion—for example, a report that a small baby had “rolled over her arm and fractured it”. Similarly, shifting the blame for the injury to a third party may be an indication of child abuse.

Delayed presentation is a common feature of abuse injuries. In normal situations, it is uncommon for parents to bring their child to the hospital more than 24 hours after an injury. After child abuse, however,

a delay is common. Finally, repetitive injuries in any child may be indicative of child abuse.

Typical Findings of Physical Abuse

A constellation of physical findings characterises the injuries seen in abused children. Some of these are listed in Table 34.1 and explained in more detail below.

Table 34.1: Typical presentations of physical abuse.

<ul style="list-style-type: none"> • Head injuries <ul style="list-style-type: none"> - Fractures, - Intracranial injuries
<ul style="list-style-type: none"> • Truncal injuries <ul style="list-style-type: none"> - Fractured ribs - Spinal cord injuries - Internal organ injuries
<ul style="list-style-type: none"> • Extremity injuries <ul style="list-style-type: none"> - Fractures of long bones - Single fracture with multiple bruises - Multiple fractures in different stages, possibly with no bruise or soft tissue injury - Metaphyseal or epiphyseal injuries, often multiple
<ul style="list-style-type: none"> • Superficial injuries <ul style="list-style-type: none"> - Cuts and bruises - Burns and scalds - Signs of hypothermia and frostbite
<ul style="list-style-type: none"> • Suffocation
<ul style="list-style-type: none"> • Poisoning

Skin

Lesions can occur everywhere. Bruises on the buttocks and lower back are often related to punishment; bruises on the cheek are usually secondary to being slapped. Other typical findings in child abuse are grip marks, pinch marks, and circumferential bruises. Defining the age of the injuries is difficult. Most skin lesions have an initially red colour, followed by a reddish-purple period within 24 hours, which then gradually progresses to a predominantly purple lesion over the next week. Discoloration to yellow/green/brown is due to degradation of haemoglobin and occurs over a period of 1–3 weeks.

Burns

Approximately 10% of physical abuse involves burns. Typical lesions found in child abuse are cigarette burns and so-called stocking/glove injuries in toddlers from hot water immersion.

Head Injuries

The incidence of abusive head injury ranges from 17 per 100,000 to 40 per 100,000, with the largest group of head injuries seen in infants 0 to 3 months of age.⁵ Approximately one-third of abusive head injuries are not recognised at the time of initial visit to a health care provider. Although nonaccidental head trauma in children younger than 3 years of age is difficult to diagnose, one should maintain a high index of suspicion. The spectrum of head injury can range from skull fractures to lethal intracranial bleeding and brain atrophy (Figure 34.1).

Subdural haematomas may also be the result of shaking. The rapid acceleration and deceleration of the shaking head appears to tear bridging veins, with resulting bleeding and subdural haematomas, often bilaterally. Another common finding is diffuse cerebral oedema with loss of normal grey-white matter differentiation (Figure 34.2). Retinal haemorrhages are nearly always present in these cases (Figure 34.3).⁶

Skeletal Injuries

Fractures in small children are rare. In all patients under the age of 3 years, the occurrence of a fracture without an adequate history should prompt the suspicion of child abuse. Approximately one-quarter of

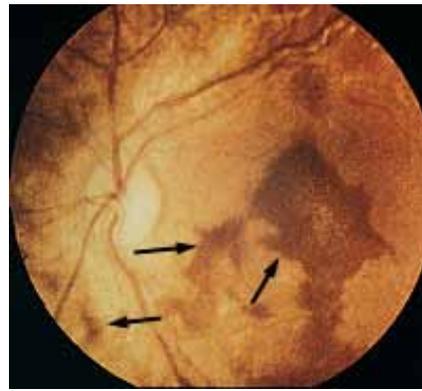
cases of physical abuse involve skeletal injury. Two-thirds of fractures involve the long bones, and the fractures can be spiral or transverse. Certain fractures are almost pathognomonic for child abuse, such as a chip fracture (corner or bucket handle fracture) of the long bones (Figure 34.4). This injury occurs due to avulsion of the corner of the metaphysis from the periosteum during wrenching injuries to the long bones. Approximately 10 days after the injury, calcification of the subperiosteal bleeding will give rise to the classical double cortex line.

In all children with suspected child abuse, a skeletal survey should be obtained. The skeletal survey comprises a combination of x-rays of the chest, skull, and extremities only in the anteroposterior (AP) direction. Repeated abuse may manifest as old rib fractures with callous formation in different phases of healing (Figure 34.5). A radionuclear bone scan is a more sensitive method to pick up old injuries, but is unreliable under the age of 1 year.

Differential Diagnosis

Child abuse is common in Africa; however, a number of other conditions may be mistaken for abuse (and vice versa), including the following:

- *Birth trauma*: should be evident from the birth history.
- *Congenital syphilis*: chronic periosteal reaction combined with metaphyseal widening and positive blood tests.
- *Osteogenesis imperfecta*: multiple fractures, blue sclerae, osteopaenia.



Source: Pressel DM. Evaluation of physical abuse in children. *The American Family Physician*. (<http://www.aafp.org/afp/20000515/3057.html>). Reproduced with permission.

Figure 34.3: Retinal haemorrhages (arrows) in a patient with shaken-baby syndrome

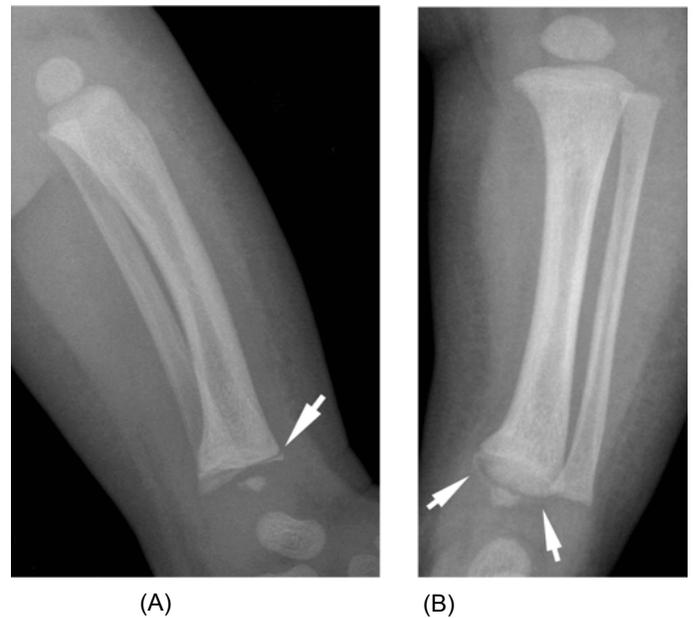


Figure 34.1: Severe brain atrophy in an infant due to physical abuse.



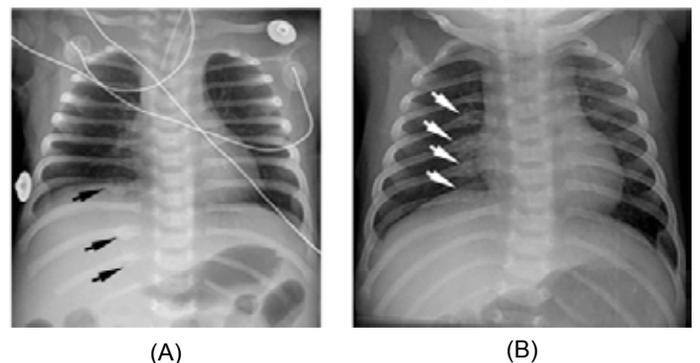
Source: Courtesy of Brian Coley MD, Nationwide Children's Hospital, Columbus, Ohio, USA.

Figure 34.2: Noncontrast CT scan of the brain. There is diffuse cerebral oedema with loss of normal grey-white matter differentiation and abnormal hypodensity in the posterior parietal lobes, indicating early infarction. There is bilateral intraventricular haemorrhage (arrowheads) and a parafalcine acute subdural haematoma (arrow).



Source: Courtesy of Brian Coley MD, Nationwide Children's Hospital, Columbus, Ohio, USA.

Figure 34.4: Classic metaphyseal lesion. (A) Lateral radiograph of the left tibia shows a distal metaphyseal corner fracture (arrow). (B) Frontal radiograph of the same left tibia shows that with a different obliquity the metaphyseal fragment appears as a crescentic fragment (arrows), the "bucket-handle" fracture.



Source: Courtesy of Brian Coley MD, Nationwide Children's Hospital, Columbus, Ohio, USA.

Figure 34.5: Rib fractures from physical abuse. (A) Frontal chest radiograph shows healing fractures of the right posterior 8th, 10th, and 11th ribs (arrows). (B) Frontal chest radiograph shows healing fractures of the right posterior 5th, 6th, 7th, and 8th ribs (arrows).

- *Rickets*: renal disease, bowed long bones, blood abnormalities.
- *Scurvy*: poor wound healing, bleeding gums, petechiae.
- *Bleeding disorders*: haemophilia, meningococcaemia.
- *Skin diseases*: impetigo, chicken pox, scaled skin syndrome (may mimic burns).

Of course, genuine accidental trauma may also present—the history, pattern of injury, and interaction with the parents should help to indicate that this is the case.

Initial Management of Injuries

The initial stabilisation of the physically assaulted child uses an ABC approach, as with any injured child:⁷

- primary survey with resuscitation;
- secondary survey with emergency treatment; and
- transfer to definitive care.

Treatment of the child is the priority at this stage; care should be taken to minimise the interference with any forensic evidence on the child's clothes or skin.

Primary Survey

The primary survey consists of ABCDE:

- Airway with cervical spine control
- Breathing with ventilatory support
- Circulation with haemorrhage control
- Disability with prevention of secondary insult
- Exposure

Useful adjuncts at this stage include chest and pelvic radiographs, initial blood tests (including a cross-match sample), an oro- or nasogastric tube, and a urinary catheter.

Secondary Survey

The initial priority is resuscitation and treatment of immediate life-threatening problems, followed by the secondary survey, in which the child undergoes a thorough head-to-toe examination. Physically abused children often have evidence of older injuries at the time of their presentation to the health services, and the evaluating physician should document these accurately. Treatment of specific injuries is discussed in detail in corresponding chapters in this book.

Transfer

The final stage of emergency management is transfer to definitive care. This involves appropriate packaging for transfer—either within the hospital or to another unit—and handover to the receiving staff. Accurate handover is essential in cases of suspected or proven physical abuse, and the presence of accurate contemporaneous notes greatly facilitates continuity of care.

Sexual Assault

Sexual abuse is common in all societies. The overall rate of sexual abuse in children under the age of 18 years is 14% for females, and 7% for males.⁸ Any child presenting with perineal injuries or infection should be suspected of being a victim of child abuse. In girls, sexual abuse can be chronic (without signs of fresh injuries, but absent hymen) or acute (often with fresh physical injuries). Small children often present with a bruised perineum. In the majority of cases, the perpetrator is known to the child and is probably a family member.⁹

A child very rarely presents with the history of sexual abuse and therefore the clinician should be alert to the following symptoms and signs of abuse:

- recurrent abdominal pain;
- difficulty walking or sitting;

- painful micturition and recurrent urinary tract infections;
- faecal soiling or retention;
- discharge from penis or vagina;
- abnormal dilatation of vagina/anus;
- genital laceration/bruising;
- vaginal bleeding; and
- signs of sexually transmitted infections.

Guidelines for Examination after Abuse

Examination of a sexually abused child should never be taken lightly; if not performed under ideal circumstances, it may seriously contribute to secondary trauma of the child. Examination should always be performed by a qualified doctor, following a specified protocol:

- A designated private area is needed.
- A third person (mother or nurse) should be present.
- The procedure should be explained to the caregiver as well as to the child.
- A full general examination is necessary; noting weight, height, and nutritional state.
- The genital examination should be performed only once.
- Small children can be examined on the mother's lap with the child's back to the mother and the mother holding the legs.
- Older children can be examined in the supine lithotomy position.
- The lateral decubitus position should be used to examine the anus.
- The stage of sexual development should be noted (using the Tanner scale).

All children with evidence of perineal trauma should be examined under anaesthesia to determine the exact nature of the injury and the need for surgical repair.

Due to the large discrepancy between sexual organs, penetration rarely occurs in sexually abused children. However, forced penetration in small children can cause a mutilating injury. Absence of penetration does not rule out abuse. In a local study, one-third of the paediatric sexual assault victims had no physical injuries.¹⁰

Bruises and first- and second-degree tears can usually be repaired primarily. However, when there is violation and laceration of the anal sphincter or the rectovaginal septum, a diverting colostomy and washout are needed. When all signs of infection have subsided (usually between 6 weeks and 3 months), the definitive repair can be performed.

The recommended routine investigations for all cases of sexual abuse are the following:

- Full blood count (FBC) and platelets, international normalisation ratio (INR) and partial thromboplastin time (PTT) to exclude a bleeding disorder.
- Vaginal or penile swab where a discharge is present—send for microscopy, culture, and sensitivities (MC&S).
- Blood for Venereal Disease Research Laboratory (VDRL).
- Human immunodeficiency virus (HIV) serology. Post exposure prophylaxis (PEP) is continued only for those who test negative.
- Photographic documentation for legal purposes. Digital photographs have to be printed, dated, and signed immediately to be useful as evidence in court.

The child should be checked for syphilis (the VDRL test) and HIV/acquired immune deficiency syndrome (AIDS). If available, antiretroviral therapy should be instituted. Do not routinely start

children on antibiotics, but wait for the results of laboratory tests. Social workers should be involved from the onset, and the child protection unit (police) contacted.

Reporting Cases of Suspected Child Abuse and Court Testimony

There are several pitfalls in dealing with a case of suspected child abuse, some of which are listed below:

- relying on the history provided by the caretakers or parents regarding the mechanism of injury;
- not undressing and examining the whole child;
- not being able to mask emotional display while examining the injured child;
- insufficient experience in examining children, requiring the child to be re-examined;
- blaming the caretakers and/or parents instead of supporting them; and/or
- omission of prophylactic antiretroviral therapy after sexual assault.

To be accused of child abuse is an extremely painful experience for anyone. Some parents will react in an aggressive way once medical staff probes the possibility of child abuse. Parents and other caretakers regularly threaten with legal action. However, the law in South Africa and several other countries protects those who report suspected child abuse in good faith, and no court cases can be pursued against people who report. Even though the investigator must be firm to conduct a thorough investigation, due recognition must be given to the possibility that the accused may be innocent.

In order to be as thorough as possible regarding the medical report, an affidavit should be written within 24 hours of severe abuse cases that might be litigated by court. This will help the doctors tremendously at a later stage. Cases often do not get to court for many years. If the abuse was not well documented or data are missing, the perpetrator nearly always evades justice.

All child sexual abuse cases ought to be investigated by the police. However, in our experience, only 30% of perpetrators end up in court, and only about 7% face prosecution. It is important to realise that child sexual abuse cases cannot be withdrawn (in adult sexual abuse cases, however, the victim can change her or his mind).

Conclusion

Child abuse contributes greatly to the burden of disease among children in Africa, who have the unenviable distinction of having the highest unintentional injury death rates in the world. There is a need in Africa to focus on creating and maintaining awareness about the magnitude, risk factors, and preventability of child injuries among policy makers, donors, practitioners, and parents.¹¹ In the special case of sexual violence toward children, it is time for African governments to publicly acknowledge the problem, establish systems of reporting, and ensure a system that protects those who report offences and swiftly dispenses justice to offenders.¹²

Evidence-Based Research

Table 34.2 presents a USA-based study that addresses the problem of health care workers missing child abuse cases.

Table 34.2: Evidence-based research.

Title	Child abuse fatalities: are we missing opportunities for intervention?
Authors	King WK, Kiesel EL, Simon HK
Institution	Department of Pediatrics and Emergency Medicine, Emory University, Atlanta, Georgia, USA
Reference	Pediatric Emergency Care 2007; 22:211–214
Problem	Missed pediatric child abuse cases at initial visit with health care provider.
Intervention	Early recognition of child abuse by emergency department health care providers.
Methods	Retrospective review of medical examiners records.
Outcome/ effect	Forty-four cases of abuse were identified, of which 37 (84%) were younger than 4 years of age. Of the 37 cases, blunt head trauma was the leading cause of death (57%), followed by blunt torso injury (13%), gunshot injury (11%), fire (8%), drowning (8%), and poisoning (3%).
Historical significance/ comments	Nonaccidental injury or child abuse is a leading cause of morbidity and mortality in the paediatric population. Fatalities tend to occur in younger children, with blunt trauma being the leading cause of death. The authors conclude that although child abuse is difficult to diagnose, most cases present to a health care provider prior to their fatal event. They suggest a number of measures to capture at-risk children and reduce the incidence of a fatal subsequent event. These include parental questionnaires, biochemical markers, ongoing education to health care providers, and tracking health care utilisation and patterns of injury.

Key Summary Points

1. Child abuse or nonaccidental injury is a leading cause of morbidity and mortality in children.
2. Abuse patients are managed as trauma patients, with a primary and secondary assessment being performed.
3. Management of the abused patient is multidisciplinary.
4. Health care providers need to be continuously educated to identify the child at risk for nonaccidental injury.
5. Children younger than 3 years of age are at highest risk for nonaccidental injury.
6. Head injury is the leading cause of mortality in child abuse, with children 0–3 months of age having the highest risk.
7. Child abuse should be suspected in all cases of unexplained injuries, discrepancy in history, delay in seeking medical care, repeated injuries, presence of sexually transmitted diseases, and sexualised behavior.

References

1. Krug EG, Dahlberg LL, Mercy JA, Zwi A, Lozano R. World Report on Violence and Health. World Health Organization, 2002.
2. Report of the Consultation on Child Abuse Prevention, 29–31 March 1999. World Health Organization, 1999 (document WHO/HSC/PVI/99.1).
3. van As S, Naidoo S, eds. Paediatric Trauma and Child Abuse. Oxford University Press, 2006, ISBN 9780195762594.
4. Fieggen AG, Wiemann M, Brown C, van As AB, Swingler GH, Peter JC. Inhuman shields—children caught in the crossfire of domestic violence. *South Afr Med J* 2004; 94(4):293–296.
5. Tingberg B, Falk AC, Flodmark O, Ygge BM. Evaluation of documentation in potential abusive head injury of infants in a paediatric emergency department. *Acta Paediatr* 2009; 98(5):777–781.
6. Pressel DM. Evaluation of physical abuse in children. *The American Family Physician*. Available at: <http://www.aafp.org/afp/20000515/3057.html> (accessed 18 January 2010).
7. Advanced Life Support Group. Advanced Paediatric Life Support: The Practical Approach. BMJ Books, 2005.
8. Peden M, Oyegbite K, Ozanne-Smith J, et al., eds. World Report on Child Injury Prevention. WHO and UNICEF, 2008. Available at: http://www.who.int/violence_injury_prevention/child/en/ (accessed 25 February 2009).
9. Barker J, Hodes D. *The Child in Mind. A Child Protection Handbook*. Routledge, 2004. ISBN 0-415-32175-1.
10. AB van As, M Whithers, AJW Millar, H Rode. Child rape—patterns of injury, management and outcome. *South Afr Med J* 2001; 91(12):1035–1038.
11. Peden M, Hyder AA. Time to keep African kids safer. *South Afr Med J* 2009; 99(1):36–37.
12. Jewkes R. Preventing sexual violence: a rights-based approach. *The Lancet* 2002; 360:1092–1093.