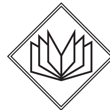
CHILD MALTREATMENT

A CLINICAL GUIDE AND REFERENCE

THIRD EDITION



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To the staff at the Center for Children's Support at the
University of Medicine and Dentistry of New Jersey, School of Osteopathic Medicine
under the leadership of Martin A. Finkel, DO, FACOP (Medical Director) and
Esther Deblinger, PhD (Clinical Director), who continue to develop and
study best practices that serve the interests of children, families, and professionals at large.
— APG

To Ray Helfer, David Chadwick, Robert Reece,
Jay Whitworth, and the other pioneers of child abuse advocacy
for deeply caring about children in a world that sometimes does not care as well as it should.
— RA

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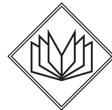

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Foreword

Safeguarding the health and well-being of all children has been an increasing focus of modern society. We have come far from the days when parents considered their children "property." Along the way we have instituted many measures to improve the health of children: immunizations, car seats, lead detection and abatement, the "Back to Sleep" campaign, and the "Reach Out and Read" campaign, to name a few.

The battle against child abuse and neglect has also made significant strides, although the war is far from over. Twenty years ago our knowledge of normal anogenital anatomy in children was just beginning to emerge, and disclosures about child sexual abuse were often discounted as stories confabulated by children. Secrets about being molested remain hidden in many cases, but sometimes they do surface in the psychiatric and medical complaints of adult men and women. It is hoped that research as well as professional and lay educational efforts have lessened the disease burden of many sexually abused individuals.

Although the various behaviors—shaking an infant, sexual abuse, neglect, etc—involved in child maltreatment are clearly detrimental to children, the mechanisms and supporting evidence required for proof are not always clearly established. For example, simple mathematical models using basic principles of physics do not sufficiently capture the unique properties of the brain. Efforts are being made to create a more precise biomechanical model to simulate an infant's head and brain during a shaking episode. Additionally, early articles not substantiated by subsequent data sometimes resurface during courtroom testimony. Experts must remain cognizant of the changing literature and information on child maltreatment. There is also the abundance of "experts" who ascribe to faulty and unsubstantiated information. In response, the child abuse community has been moving toward a certification process by the American Board of Pediatrics. Such a process would minimize the opportunity for self-proclaimed experts to contradict legitimate evaluations and testimony.

The challenges that face those who seek to protect children from maltreatment include moving forward, preventing abuse before it starts, and reducing the rate of recidivism in those who have been abused. Professional education and early identification are critical to secondary prevention. Appropriate judicial decisions are also essential to ensure that children are not inappropriately returned to parents who lack the necessary skills to care for their offspring. Interventional programs must be created to make reunification a safe and satisfactory experience for children and their parents. Primary prevention is perhaps even more complicated. Although epidemiological studies have identified high-risk factors for abuse, providing anticipatory interventional services is costly and only partially validated. The societal issues of poverty, violence, and substance abuse are clearly contributing factors.

As professionals committed to helping children reach their potential, we must take steps to ensure that all children are cared for in a safe, nurturing environment. Fortunately many promising programs are on the horizon, such as the Health CARES (Child Abuse Recognition and Evaluation Study) Network and the efforts of the Centers for Disease Control and Prevention (CDC) toward child abuse prevention.

Up-to-date, evidence-based literature plays a vital role in the educational process. *Child Maltreatment: A Clinical Guide and Reference and A Comprehensive Photographic Reference Identifying Potential Child Abuse, 3rd Edition*, with its wealth of information compiled by multiple childcare professionals who work individually and collectively to prevent, identify, evaluate, and treat children and families facing the many challenges associated with a high risk of child maltreatment, is part of this process. The more we learn, the stronger our ability is to effectively keep children safe. Our resolve remains strong to work tirelessly to reduce and eventually remove the threat posed to the well-being of all children by child maltreatment. With education, sound

information such as that contained in this textbook, research, and advocacy, we can work individually and collectively to influence the future of the most vulnerable members of our society.

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FOREWORD

The field of child maltreatment has evolved over a period of many decades. Over the years, the developments have been both heartening and discouraging. Greater attention has been paid to the problem and accompanying issues, raising hope that the epidemic of child abuse can be erradicated. However, as we continue to learn about child maltreatment we see more cases come to light, discouraging the efforts of the individual professionals handling them.

Child maltreatment was once a clandestine topic that was not discussed. Society as a whole viewed it as a problem that did not exist in wealthy or elite families. Often only medical professionals were privy to this family secret and reporting was sporadic. As we have come to know more about the problem we find that it crosses all economic, cultural, social, and racial lines. Any family could harbor some form of child maltreatment, yet appear perfectly normal to the community. It is encouraging to see how many disciplines, including medical, law enforcement, legal, and social science professionals, are now included in the comprehensive approach to child maltreatment. Each specialty has much to contribute as they interact with families. Their efforts are valuable not only in handling the results of child maltreatment, but also in preventing the development of patterns of child maltreatment within the family unit.

Although the medical community is still the primary detection unit, a variety of professionals must be informed and trained to deal with child maltreatment in its many forms. With resources such as this comprehensive volume on child maltreatment, professionals are better equipped to deal with children who have been abused, perpetrators, families in crisis, and individuals who are involved in the process of handling child maltreatment cases. Better dialogue between disciplines is encouraged, as collaboration and cooperation between the disciplines permits all professionals to do their best in addressing maltreatment issues.

The goal is to help children and their families. The first priority is the protection of the child, which is optimally achieved through preventive efforts. This book has ample coverage of the role each professional and caregiver plays in protecting children from abuse. Prevention efforts involve the entire community and are both focused and general in nature. Families and children at particular risk are targeted earlier in many cases. Supportive services for families are becoming more widespread as the impact of child maltreatment has become recognized. This book offers practical advice on how such preventive efforts can be implemented.

For cases where child maltreatment has taken place, specific medical care is outlined, with special attention given to dealing with parents who are also perpetrators. The roles of medical professionals cannot be overemphasized since the vast majority of child maltreatment cases are seen in the ER or at a primary healthcare provider's office. Careful approaches are offered to teach medical professionals how to maintain evidence that may be crucial to law enforcement personnel while treating the child. The importance of the crime scene is explained, along with the sources of both obvious and less-than-obvious clues as to what has happened. The function of social services personnel who are at hospitals and clinics is described so that this valuable resource is not overlooked.

When first responders at a scene discover evidence of child maltreatment or neglect, the approach differs somewhat from cases discovered by medical personnel. The steps that are taken are outlined clearly, with careful attention to building a foundation of evidence as well as seeking to protect the child. The balance of obtaining medical evidence and being sensitive to the needs of the child and family is explained, with practical approaches to achieving both evidentiary and humanitarian goals. A concise presentation of what happens when the court system becomes involved is also offered.

The third edition of *Child Maltreatment: A Clinical Guide and Reference and A Comprehensive Photographic Reference Identifying Potential Child Abuse* presents a contemporary, complete, and balanced look at the epidemic of child maltreatment and what is being done to combat it. The desired outcome is healthier, happier children who grow to become well-adjusted adults and are readily integrated into society as contributing members. Through the comprehensive approach offered in this textbook it is hoped that we are getting closer to this goal.

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Preface

Child maltreatment in its various forms remains a significant problem confronting children and their families worldwide. The incidence and prevalence statistics surrounding child maltreatment continue to be staggering when compared to the reduction in pediatric morbidity and mortality associated with infectious diseases over the past 100 years. This reference is put forth to help healthcare professionals, social service providers, and law enforcement personnel meet the challenges that arise in dealing with this preventable problem that harms children and their families. Although the text is approached primarily from a healthcare point of view, the information contained will also benefit other disciplines and professionals such as social service workers, attorneys, law enforcement officers, state agencies, and others who might be involved with children of suspect child maltreatment. Collected in this third edition is information concerning the multidisciplinary team approach to physical abuse, sexual abuse, psychological abuse, and neglect that has evolved over the past 40 years from the work of dedicated professionals.

The previous two editions of *Child Maltreatment: A Clinical Guide and Reference*, edited by James A. Monteleone, MD, were well-received by clinicians dealing with abused and neglected children and serve as a solid foundation on which this nearly total revision is based. As the new editors, we have recruited 70 new contributing authors to add their expertise. The text has expanded from 28 chapters in the second edition to the current 43 contained in this volume. Since no one person or discipline could effectively address all aspects of child maltreatment, we sought specific expertise in each area and found dedicated colleagues who were willing to share their time and knowledge for this project. The contributing authors are all individuals who have been extensively involved in issues related to child health and protection activities for significant periods of time and are uniformly acknowledged as leading figures in their fields by peers and colleagues.

In addition to the traditional chapters one would expect in a comprehensive text dealing with child maltreatment, such as those dealing with the forms of maltreatment as well as prevention, evaluation, and intervention, we have added chapters on the risk of the Internet to the safety of children, intimate partner violence and its relationship to child abuse, the risks that might be found in a faith-based setting, how to prepare a case for court, how to prepare to be an expert witness, the approach to physician and nurse education regarding child maltreatment, and research and federal funding opportunities in the United States. We have emphasized the multidisciplinary team approach to caring for children who are maltreated. Specialists in each area offer insights regarding approaches to identifying and managing specific forms of child maltreatment, including procedures for evaluation and practical guidelines for handling cases.

The companion volume to this book, *Child Maltreatment: A Comprehensive Photographic Reference Identifying Potential Child Abuse*, has also been expanded with the addition of over 850 new photographs. The format has been revised from the previous editions and, where available, descriptions of the cases being illustrated have been added. Together, these two references present a comprehensive source of information covering all areas of child maltreatment.

It is hoped that with the addition of new chapters and the expansion of existing material, the clinician who deals with any area of child maltreatment will be more fully equipped to assess any situation appropriately and determine the best course of action. Information is a vital ally in recognizing the signs of maltreatment. A thorough clinical examination, interviews with the child and family, and possible site investigations depending on the situation, are critical. Differentiating maltreatment from other patterns of injury helps in the prosecution of the guilty and the protection of innocent caregivers. Clinicians must rely on the best evidence available at the time

of the child's evaluation. Ultimately, all professionals have the shared goal of preventing child maltreatment, and as we move into the next phase of study of child maltreatment, we hope the effective techniques and programs described in the chapter on prevention will take hold and reduce the incidence and prevalence of child maltreatment worldwide. The focus of all our work is the health and well-being of children and their families, and we offer this volume as a powerful tool to use in creating a better future for them.

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Reviews of the Third Edition

Whether in an intensive care unit caring for a child abuse victim, providing training, or testifying as an expert witness, there is one resource that I know I can cite as a reliable reference, and that is Child Maltreatment. *This is the most outstanding text of its kind, and provides a complete review with relevant references on all aspects of the medical diagnosis and treatment of child abuse and neglect. I recommend* Child Maltreatment *to all members of an investigative multidisciplinary team and consider it a mandatory resource in any medical, social science, or criminal justice library.*

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This publication presents a comprehensive look at the issues involved in cases of child maltreatment, emphasizing the contemporary importance of this subject together with reviewing the multidisciplinary techniques for forensically detecting as well as addressing the needs of victims of such maltreatment. The text provides professionals in the fields of law, social science and the healthcare industry with invaluable source materials when confronted with suspected child maltreatment.

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Angelo Giardino and his interdisciplinary team of colleagues have continued to improve on an already exceptional collection of essays focused on the nature, extent and seriousness of child maltreatment in the United States and other economically advanced countries. In addition to providing the reader with a deep understanding of the complex forces that contribute to child maltreatment, the volume's chapters offer clinicians and policy makers alike state-of-the-art guidance in preventing and caring for children who become victims of abuse and neglect. Dr. Giardino and his colleagues are to be congratulated for their pioneering contributions in helping to halt the current epidemic of child maltreatment cases.

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This edition of Child Maltreatment *builds on the terrific start provided by James Monteleone with an expansion that is up-to-date, complete, and provides the best available information from an extraordinary group of contributors. It is a "must," not only for specialists in the field of child abuse and neglect, but for all health professionals who provide care to children.*

Richard Krugman, MD
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This 3rd edition of Child Maltreatment *includes the very latest in research and clinical issues related to the injury and exploitation of children. The editors have gathered the best and the brightest authors in the field to write the chapters and the volumes contain essential knowledge for students and clinicians. It is designed to be a reference and resource for all agencies that assist and manage child maltreatment issues.*

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The third edition of this vital reference designed for child maltreatment professionals contains new, cutting-edge, and evidence-based information. Comprised of 2 volumes with a total of 62 chapters, Child Maltreatment: A Clinical Guide and Reference *and* A Comprehensive Photographic Reference Identifying Potential Child Abuse *covers virtually every aspect of child physical, sexual, and psychological abuse, child neglect, and service delivery systems that either encounter or address child maltreatment. This reference work should be in the library of every professional concerned with the problem of child maltreatment.*

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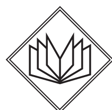

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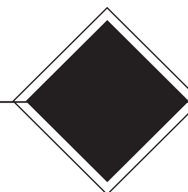

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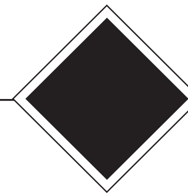

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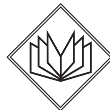
CHILD MALTREATMENT

A CLINICAL GUIDE AND REFERENCE

THIRD EDITION



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Chapter 1

Overview of Child Maltreatment

John M. Leventhal, MD

Since 1962, when Kempe and colleagues first described the "battered child syndrome,"[1] it has become increasingly clear that child maltreatment, including physical abuse, neglect, sexual abuse, and emotional abuse, is far too common, has profound short- and long-term effects on children and families, and is extremely costly to society. It also has become clear that much greater attention and financial support will be necessary to increase dramatically the efforts aimed at preventing child maltreatment and supporting families.

Before the article by Kempe and colleagues, observant radiologists raised important questions about how major injuries, such as fractures, occurred in young children and hesitantly proposed that these injuries were the result of actions by the caregivers.[2,3] Others, such as Adelson,[4] wrote about the killing of children.

Kempe's article, however, provided a major shift in the understanding of certain poorly explained childhood injuries that were seen by countless clinicians around the country. Whereas some clinicians had not recognized that parents and other caregivers were hurting their children, others likely had recognized the problem but had kept quiet about it because it was too painful and difficult to believe. Kempe and his coauthors provided information about both the clinical spectrum of the battered child syndrome and the first epidemiological study, in which 749 abused children were identified around the country. It seems very unlikely that anyone at that time could have envisioned what has been learned about the problem's extent over the last 4 decades.

The recognition of abused children created new problems and questions for hospitals and clinicians. What is the home like where the child was abused? Is it safe to send the child home, and, if not, where should the child go? In response to these types of questions and others and the need to protect children, state and federal legislation in the 1960s and 1970s established child protective services (CPS) agencies in each state, and laws were passed mandating that physicians and other professionals report suspected abuse to CPS.

Definitions and Epidemiology

Maltreatment of children includes neglect, physical abuse, sexual abuse, and emotional maltreatment. ***Neglect*** is defined as acts of omission and includes the failure to provide adequate nutrition, clothing, shelter, or supervision; abandonment; and failure to ensure that the child receives adequate healthcare, dental care, or education. Although neglect can be a single event, such as leaving a young child unsupervised in an unsafe setting, it often is a pattern of unsafe or inadequate care, such as a pattern of inadequate supervision or inadequate nutrition because of a serious mental health problem or substance abuse on the part of the caregiver. ***Physical abuse*** is defined as acts of commission toward the child by a parent or caregiver. Such acts can result in harm to the child or they might intend to harm, although there may be no harm or only a minor injury. It can include injuries that occur when a child is punished severely or when a parent loses control and shakes a crying infant. Injuries that are

suspicious for abuse or neglect must be distinguished from unintentional (or accidental) injuries. Also, clinicians must take care to distinguish neglect from episodes of less serious failures to provide adequate care to a child, such as when a 10-month-old rolls off of a bed or a child has missed a few appointments for well-child care and has not received all of the appropriate immunizations.

Sexual abuse is the involvement of adults, older children, or adolescents in sexual activities with children who cannot give appropriate consent and who do not understand the significance of what is happening to them.[5] Such activities violate family and societal taboos. Sexual abuse includes, for example, sexual touching of the genitalia, oral sex, attempted or actual sexual intercourse, or including children in child pornography. Although a 5-year age difference between "victim" and "perpetrator" is often used to decide whether sexual behaviors between two children should be considered sexual abuse, as opposed to "sexualized play," it is often more helpful to examine how invasive and persistent the behaviors are by the older child and whether the younger child wanted the behaviors to stop and felt threatened.

Emotional (or psychological) ***maltreatment*** is "a repeated pattern of damaging interactions between parent(s) and child that become typical of the relationship."[6] This form of maltreatment occurs when a child repeatedly feels that he or she is unwanted, unloved, or worthless. It includes denigration, belittling, and ridiculing; it also can include actively rejecting the child or ignoring the child's emotional needs. Although emotional maltreatment is likely the most common form of maltreatment, children are infrequently reported to CPS agencies for emotional maltreatment. Emotional maltreatment, however, often accompanies other types of abuse or neglect and plays a major role in the consequences of these types of maltreatment.

Much has been learned about the epidemiology of child maltreatment. Since 1976, each year in the United States, data are collected from each state's CPS agency to track the number of reports and substantiated cases. By the early 1990s, there were over 3 million reports nationwide, and approximately one third of these reports were substantiated, meaning that the local CPS agency had enough evidence to believe that child maltreatment had occurred.

From 1992 to 1999, there was a 14% decline in the yearly tally of substantiated reports of maltreatment. Although substantiated cases of abuse and neglect each declined, the largest decline (39%) occurred nationwide in substantiated reports of sexual abuse.[7] It is difficult to know how much of this decrease was the result of a true change in the occurrence of the phenomenon and how much was the result of other changes, such as the criteria used by CPS to substantiate reports of sexual abuse or how specific reports are categorized as abuse, neglect, or sexual abuse.[8]

In 2001 there were 2.7 million reports to CPS agencies nationwide, and 903 000 cases were substantiated as being victims of maltreatment.[9] Thus 12.4 per 1000 children were subjects of a substantiated report of maltreatment. Of these, 59% were caused by neglect, 19% by physical abuse, 10% by sexual abuse, 7% by emotional maltreatment, and 5% by other high-risk situations. In addition, approximately 1300 children died because of abuse or neglect. The majority of these children were younger than 6 years, and over 40% were younger than 1 year old. Experts believe that deaths caused by abuse or neglect may be significantly undercounted,[10] and as many as 2000 children may die each year because of maltreatment.[11]

The data from CPS agencies are based only on cases of child maltreatment that are actually recognized in the community and reported to and substantiated by CPS; therefore at least 4 other approaches have been used to examine the occurrences of child maltreatment, as follows:

1. Prospective data collection in selected communities to identify cases of maltreatment, even if not reported to CPS. This approach has been used in 3

national studies, the National Incidence Studies (NIS), which were conducted from 1979 to 1980 (NIS-1), 1986 to 1987 (NIS-2), and 1993 to 1995 (NIS-3).[12] In each of these studies the number of identified victims of maltreatment has been substantially higher than the number of cases substantiated by CPS over the comparable time period.

2. Asking adults about the details of how they have treated their children over a specific period, such as the previous month or a year.[13]
3. Asking children about their experiences of violence, including their experiences of maltreatment.[14]
4. Asking adults about how they were treated during childhood.[15]

Using this last approach has been very helpful in gaining an understanding of how many adults have experienced different types of maltreatment during childhood. For example, numerous studies have asked adult women and men about their experiences of sexual abuse during childhood and adolescence. A review of studies of community samples in the United States and Canada found that the prevalence of sexual abuse reported by women was 2% to 62% and by men, 3% to 16%. Finkelhor[15] suggested that a reasonable summary statistic for women would be 20% and for men, 5% to 10%.

Major Changes in Responding to Child Maltreatment

Since the legislation of the 1960s and 1970s, there have been major changes in how clinicians, CPS agencies, government, and society in general have responded to child maltreatment. Nine of these changes are discussed briefly in the following sections.

Child Maltreatment as a Broader Term

First, the term ***child abuse*** was broadened and developed into a new, all-encompassing term ***child maltreatment***. After the recognition of physical abuse came the recognition of neglect and, in the late 1970s and 1980s, the recognition of sexual abuse. All along, clinicians recognized the importance of the emotional aspects, which have become particularly important in understanding many of the short- and long-term consequences of maltreatment. Although an individual child may be reported for a single type of maltreatment (eg, physical abuse), it has become increasingly clear that children reported for one type of maltreatment often have suffered from other types as well.

Understanding the Etiology of Child Maltreatment

The understanding of how abuse and neglect occur in families has changed over time. The initial focus was on parental psychopathology; however, a more helpful framework focuses on abnormalities in the parent-child relationship[16] in the context of an ecological model of parenting.[17] Bavolek[16] noted the following 4 abnormalities in the parent–child relationship that can lead to abuse or neglect:

1. Inappropriate parental expectations of the child
2. Lack of empathy toward the child's needs
3. The parent's belief in physical punishment
4. Parental role reversal

These parental thoughts, feelings, and behaviors need to be considered in an ecological model,[17] in which the parent-child relationship is viewed as existing in layers of systems, including the family, the extended family, the social setting, and the cultural context. How parents feel about and behave toward their child are influenced by characteristics of the child (eg, unwanted), parent (abused during childhood), family

(domestic violence), social setting (poor housing), and cultural context (violence in the neighborhood). This more complex approach to understanding parenting behaviors in general also can be used to target interventions to support the parent-child relationship. For example, isolated families can be helped by linking them to social supports, depressed parents can be prescribed antidepressants, or drug-abusing parents can be provided with treatment services. Each level of treatment can relieve stresses that can influence how parents care for their children.

There have been less dramatic changes in understanding why adults and older children perpetrate sexual abuse. For sexual abuse to occur, at least 2 prerequisites are necessary: (1) the offender's sexual arousal to children and (2) the willingness to act on this arousal.[18] A common approach to understanding such behaviors has been to use a case-control study to examine personal, family, or social factors in sexual offenders compared with nonsexual offenders. Longitudinal studies in which children are followed into adolescence or adulthood have recently contributed to the understanding of sexual offending. In such studies, children with certain risk factors are compared to those without such risk factors; the frequency of sexual offending in each group is then examined over time. For example, in a recent longitudinal study the investigators sought to gain further insight into which boys who had been sexually abused went on to sexually abuse others.[19] Of 224 boys who had been sexually abused and followed for 7 to 19 years, 26 (11.6%) committed sexual offenses. Compared to the nonoffenders, the sexual offenders were more likely to have experienced the following:

— Material neglect (odds ratio = 3.4)

— Lack of supervision (3.0)

— Sexual abuse by a female (3.1)

— Witnessing of serious family violence (3.1)

— Demonstrating cruelty to animals (7.9)

The results of such studies help to understand subgroups of sexually abused boys who are at high risk of becoming perpetrators.

The Mandated Reporter

A third major change has been in the definition and expectations of mandated reporters. Over the years, the types of professionals who have been identified in state statutes as mandated reporters have been expanded to include almost every type of professional who has contact with children. Thus the list includes physicians, dentists, teachers, social workers, psychologists, police, clergy, and others. Lawyers are not included so that they can represent their clients without having to report them as well. Mandated reporters are expected to report both by telephone to a central hotline and in writing. Most state laws indicate that the mandated reporter must report if there is reasonable suspicion of abuse or neglect; mandated reporters do not have to be 100% certain. State statutes protect the reporter from being sued for reporting in good faith. The failure to report a suspected case can place a child at risk of a more serious occurrence of maltreatment, and this inaction can result in prosecution by the state.

The Role of Child Protective Services

A fourth change has been in the role of the CPS agency. In general, CPS agencies have been underfunded and staffed with inexperienced and undertrained workers. Efforts to improve the quality of the work provided by the agencies have occurred through federal and state legislation, as well as lawsuits against the state's agency. In some states the federal court has provided ongoing oversight of the agency, and this has resulted in increased services for children in the care of the agency and often increased funding from the state legislature. The passage of federal laws and the availability of federal funds also have influenced state practices, such as the timing of

administrative case reviews or the amount of effort and actions taken by CPS in attempting to reunify maltreated children with their families or terminating parental rights so that a child can be adopted.

The modern CPS agency no longer can just investigate cases of suspected maltreatment and place children in foster care; the scope of the work has become considerably more complex. For example, CPS must be able to investigate cases of suspected maltreatment in foster care; ensure that children in foster care, including many with complex medical needs, receive appropriate medical and psychological care; help adolescents transition out of the foster care system and into independent living arrangements; and help families with serious problems related to substance abuse or family violence. In a few states the CPS agencies have responded by expanding the expertise of their staff; by having special consultation units that might include a nurse practitioner, an educational specialist, a substance abuse specialist, and others; and by relying on expertise from the community to provide advice and consultation. In short, CPS has become more collaborative with the community and with its professionals.

In addition, many CPS agencies have expanded the scope of their work and no longer just focus on child protection (ie, investigating reports, making determinations of substantiation, placing children in foster care, and helping families to receive services). Instead, such agencies often have been given the responsibility for the state's services related to child mental health and juvenile justice. The merging of these functions in a single agency has theoretical and practical benefits, because there is overlap in the children and families served. For example, mental health services can be funded by the agency and targeted to families receiving protective services.

Some critics have contended that the focus on investigations of suspected maltreatment has put too much emphasis on the investigation process and not enough on the needs of troubled children and families. In response to this concern, some CPS agencies are attempting to help families by triaging calls to the state hotline so that community-based services and less intensive investigating can be offered to less serious cases. How successful these programs will be has yet to be determined.

Collaborative Investigations

A fifth major change has been concerned with how cases are investigated. Over the last several years, there has been a growing nationwide trend, particularly concerning cases of suspected sexual abuse and serious physical abuse, to have collaborative investigations between CPS and the police, and many states have passed legislation that supports in each judicial district or region the development of a multidisciplinary investigation team. The purposes of such a team are to ensure successful prosecution of cases and minimize the secondary trauma to children and families. Teams comprise experts from the community, including CPS, police, and prosecutors; a physician or nurse practitioner with expertise in sexual abuse and physical abuse; forensic interviewers; mental health clinicians; and representatives from other agencies. Although there has been little research on the effectiveness of this approach, better coordination of investigations and clearly defined tasks seem to result in more skilled interviewing of the child, fewer interviews of the child by different investigators, more timely medical examinations and referrals for mental health treatment, more support for the family, and more complete investigations.

Obtaining Information From Children

Understanding the child's own perspective of the suspected abuse, neglect, or sexual abuse has always been viewed as critical. A major change over the last 2 decades has been the increasing attention to research on children as reporters of their experiences, whether to clinicians or investigators or in the courts, and the subsequent efforts to translate these research findings into practice. The major focus has been on how children report suspected sexual abuse. Researchers have investigated children's

short- and long-term memory, how children describe events that they experience or witness, and factors (such as the kinds of questions) that influence their reporting.[20,21] Research has included laboratory-based and naturalistic studies. In laboratory studies, factors such as what an adult says or does can be manipulated to see how these changes influence children's reports of what they heard or saw. In naturalistic studies, investigators often take advantage of events that happen to children. For example, children have been asked to report about a recent physical examination and in particular to report on whether the physician examined their genitals.[22]

The findings from this research indicate that children (especially young ones) could be influenced to say that sexual abuse has occurred when it has not, and rulings by the courts that adults were imprisoned improperly, in part, by children's limited statements have provided a major impetus to improve the interviewing of children about suspected sexual abuse. Suggested guidelines have been published,[23,24] and studies have been conducted examining actual interviews and various approaches to interviewing.[25] In addition, forensic interviewers have been specially trained on how to interview children and ask children nonleading questions about their experiences.

Attention to Prevention

A major focus has been directed toward prevention. Not surprisingly, it was difficult to focus on prevention when maltreated children were neither being appropriately recognized nor receiving the appropriate evaluation and treatment. Since the 1980s, however, there has been increasing attention to prevention.[26] For child sexual abuse, these preventive efforts have targeted young children, who often are taught about "good" and "bad" touch. Research examining the effects of these programs has shown changes in knowledge of the children. It has been more difficult to show changes in behaviors,[27] but many clinicians are aware of children who disclosed ongoing sexual abuse after participating in such educational activities. Children who have participated in such programs also may be more likely to tell family members about attempted sexual abuse.

During the last decade, there has been a renewed interest in the development of programs to prevent physical abuse and neglect.[26,28-30] A major strategy has been the use of regular and frequent home visiting for socially high-risk, first-time mothers, beginning during pregnancy or shortly after the child's birth and continuing through the first 2 or 3 years of the child's life. The home visitors have been nurses, paraprofessionals, or, sometimes, trained volunteers; the home visitor uses a parenting curriculum, develops a therapeutic relationship with the mother, and aims to do the following:

— Provide advice about and model effective parenting

— Help mothers develop parenting skills and good relationships with their infants

— Help mothers make good life decisions about important topics, such as returning to school, choice of day care, or staying with the baby's father

— Recognize early problems related to family violence and maltreatment in the home

— Help ensure that the child receives appropriate medical care

— Help families link to appropriate community-based services, such as mental health services for the mother or developmental services for the child

Evaluations of the effectiveness of such prevention programs are methodologically complex and extremely costly to conduct. The most rigorous evaluations to date have been conducted by Olds and colleagues.[31-33] In a series of randomized trials, these investigators have shown that in families receiving home visitations by nurses (from the prenatal period to the child's second birthday), compared with those receiving standard care, there are lower rates of serious injuries to the child and, over time, lower rates of reports to CPS.[31-33] In addition, in a 15-year follow-up, mothers in the

intervention group who were not married and were from households of low income at the time of enrollment had fewer children, fewer months receiving welfare benefits, and fewer arrests.[31] There were long-term benefits for the children as well. For example, adolescents whose mothers received home visitation and were unmarried and of low socioeconomic status had fewer arrests and fewer lifetime sex partners, smoked less frequently, and consumed less alcohol compared to adolescents of comparable mothers who did not get the intervention.[34] These long-term results have helped to stimulate interest in early preventive services for socially high-risk children and families.

It is difficult to know the exact number of intensive, home-based prevention programs in the country, but many communities have used local, state, and/or foundation funding to establish such programs. The cost of providing such services for 1 year is about $4000 to $5000 per family. In 2001 there were almost 600 intensive, home-based prevention programs in the country serving approximately 50 000 high-risk families at an estimated cost of $170 million.[30] The number of families being served and the funding available have likely increased since then.

The preventive efforts have occurred without a clear agenda on prevention by the federal government and with minimal federal funds to support such programs. An important challenge will be to get policy makers at the federal level to focus on prevention and provide substantial funding for programs and research. Recently, professional organizations and individuals around the country organized a coalition called A National Call to Action to advocate for a national approach to prevention and a major leadership role for the federal government.[35]

A Marked Increase in Research

An eighth change has been the marked increase in research focused on child maltreatment. This research has advanced the field in many important ways, including the following:

— Research has had an important effect on practice. For example, studies have examined the range of normal genital[36] and anal[37] findings in children and compared the physical findings in nonsexually abused and sexually abused children[38]; other studies have examined the effects of interviewing children in different ways both in the laboratory settings,[21] where the experimental variables can be manipulated, and in the real-world settings of interviewing children about their actual experiences.[25]

— Research has had a profound effect on the understanding of the scope of the problem and the short- and long-term consequences of maltreatment.[39] These studies have made it increasingly clear that child maltreatment is not just a childhood problem.[40-42]

— Research has contributed to describing the phenomenon of child maltreatment and the range of clinical presentations and findings.[40-42]

Other topics have been addressed, but clearly need more attention. For example, few studies examine the effectiveness of various kinds of mental health treatments for maltreated children,[43,44] and even fewer studies examine the practices of CPS agencies, ways to improve them, and comparisons of alternative ways of practice.[45]

Although the body of research and the number of researchers focusing on child maltreatment have been greatly expanded, there has been a growing concern that little attention has been paid to the problem of child maltreatment by the National Institutes of Health (NIH) and other federal agencies that fund research. Thus lack of federal funding has made it difficult to conduct large and expensive research projects on child maltreatment and to attract researchers to the field of child maltreatment. The recent development of the NIH Child Abuse and Neglect Working Group and some relatively small amounts of funding from NIH for the problem of neglect may indicate a change in philosophy concerning the interest of child abuse research at the NIH.[46]

The Consequences Extend Into Adult Life

Over the last two decades, there have been increasingly sophisticated research efforts to understand the consequences of maltreatment. The following 3 epidemiological approaches have been used to investigate this problem:

1. A few investigators have used longitudinal cohorts to follow maltreated and comparison children over time and have investigated outcomes, such as developmental problems, juvenile or adult violence, mental health problems, and substance abuse.[47]
2. A second approach has been to use a case-control design in which cases are adults with a specific problem such as depression, and controls are adults who do not have the problem.[48] Researchers then ask both groups about childhood experiences, such as physical abuse or sexual abuse.
3. A third approach has been to identify a sample of adults from a specific population, such as individuals from a geographic area or members of a health maintenance organization. The adults are asked about both their past experiences, such as physical abuse, and their current functioning, such as physical and mental health.[40] Rates of the outcomes are then compared in the groups with and without certain past experiences.

These approaches have provided clear evidence that maltreatment has important long-term effects on physical and mental health, use of substances, interpersonal relationships, perpetrating maltreatment, criminality, and parenting. For example, in the Adverse Childhood Experiences (ACE) Study, members of the Kaiser Health Plan in San Diego completed a questionnaire about health and eight adverse childhood experiences: emotional, physical, and sexual abuse, exposure to a battered mother, household substance use, mental illness in the household, parental separation or divorce, and an incarcerated household member. Reports to date have shown strong relationships between the number of adverse childhood experiences and health and mental health outcomes, such as attempted suicide,[40] smoking,[41] and unintended pregnancies.[42] In the study on attempted suicide, adults who had 4 adverse childhood experiences were 4 times more likely to have attempted suicide in their lifetime compared with adults who reported no such childhood experience. For adults reporting at least 7 such childhood experiences, the odds ratio was 17.[40]

In addition to epidemiological studies concerning the consequences of child maltreatment, there has been a new interest in how early experiences affect the development of the brain and the neuroendocrine system.[49]

The challenges of providing care to children and their families are clear. Early recognition of child maltreatment will help stop the hurt experienced by children, help families change their behaviors, and in some cases save lives. Once the maltreatment is recognized, appropriate medical and mental health services can help children and families begin to heal and understand what has happened to them. A long-term goal of such treatment is to reduce the physical and mental health consequences of maltreatment that can continue into adulthood. In addition to recognition and treatment, a major effort will be needed to expand preventive services so that all high-risk families and eventually all families with young children can receive these supportive services.

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Chapter 2

Skeletal and Visceral Radiological Imaging

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The role of radiology in child abuse is threefold: (1) identifying traumatic injury; (2) recognizing abusive origin; and (3) employing the optimal imaging modality to document findings. The radiologist's strength lies in identifying the type, extent, and age of the child's injury, as well as in distinguishing between accidental and nonaccidental injury because the recognition of nonaccidental injury opens the door to intervention, thereby breaking the cycle of abuse.

The pediatric radiologist encounters a wide range of injuries resulting from child abuse. The most obvious are the physical injuries from intentionally inflicted trauma. Injuries related to child neglect, although equally important, are more common but harder to detect.

Awareness of abuse and its indicators allows the radiologist to characterize the injuries. Radiographs are most effective in evaluating physical changes to bony structures. With the utilization of additional diagnostic modalities, less obvious but significant internal injuries now can be detected.

The radiologist plays a key role on the management team for identification, documentation, reporting, and testimony in cases of child abuse. In recognizing physical abuse, the radiologist must possess an awareness of the likely mechanism of injury and add knowledge of the specificity of radiological findings and the demographics of child abuse.[1,2]

Often the lack of correlation between injury and the known mechanism required to produce the injury allows for the diagnosis of abuse.[3] Maintaining a high index of suspicion for abuse in differential diagnosis allows the radiologist to be among the first to recognize discrepancies between the history and radiographical findings. Then the appropriate imaging studies to provide the optimal information to confirm or deny the possibility of nonaccidental injury are selected.

The radiologist's role includes the responsibility to report suspected child abuse to the proper authorities and to work with them to prevent further injury.[4] Usually, radiologists act as consultants in those cases, so they must also be cognizant of the laws involved in child abuse. They may be critical in determining if an injury is the result of nonaccidental trauma. The radiologist's reports have both clinical and legal significance. Therefore, documentation must be complete and accurate. For more detailed reading regarding this topic and responsibilities in court cases and recommendations for radiologists, see *Diagnostic Imaging in Child Abuse*.[5]

One of the greatest rewards in diagnosing child abuse is the prevention of recurrence. Meticulous attention to technique and interpretation is essential, so confident diagnoses might be validated during future testimony, when necessary.[6]

It falls within the radiologist's realm to consider the risk-to-benefit ratio for all examinations. The issue of cost versus diagnostic benefit is subjective and difficult to evaluate, given the implicit ethical considerations. Potential risks from ionizing radiation and complications of contrast or sedation must be weighed against the benefit of preventing further abuse.

In summary, the pediatric radiologist plays a strategic role in the diagnosis of abuse. Awareness of the mechanisms of injury and selecting the optimal imaging modality for the specificity of findings, make the pediatric radiologist a key member in the team of caregivers for the abused or neglected child (**Table 2-1**).

Table 2-1. Key Plain Film Findings Suspicious of Abuse
— The metaphyseal-epiphyseal fracture, occurring at the ends of long bones, the acromial process of the scapula, and the clavicular ends
— Rib fractures in infants, multiple rib fractures, or posterior location (Rib fractures are uncommon sequelae of delivery or CPR.)
— Fractures in multiple stages of healing
— Long-bone fractures in children who are not ambulatory (under 12 months)
— Vertebral fractures in infants (requires neurological and skeletal follow-up)
— Infantile subdural hematomas (in the absence of appropriate history and external signs)
— Skull fractures that are depressed, cross the midline, or occipital

Modalities

The radiologist has multiple methods available for evaluating bony and soft tissue structures, including X-ray films, nuclear medicine, computed tomography, magnetic resonance imaging, and ultrasound.

Diagnostic Radiographs

Radiographs provide the foundation for imaging nonaccidental injury in children. The radiographic skeletal survey has its highest yield in children under the age of 2 years. After this, a more directed approach can be used; after the age of 5 years, complete screening is usually unnecessary. Bone injuries by themselves rarely result in long-term handicapping conditions. When performing radiological studies for bone injuries, the greatest benefit derived from documenting and dating abuse is prevention of recurrence.

The skeletal survey should include: a two-view chest with bone technique, right and left oblique views of the ribs, two skull views, lateral thoracolumbar spine, anteroposterior (AP) pelvis, and AP views of the upper and lower extremities, posteroanterior (PA) hands and feet[7] and a lateral C-spine,[8] the result of reported cases of cervical fractures[9] and a case of hangman's fracture.[10] Although the number of radiographs will vary with the size of the patient, the use of a single image, formerly called a "babygram", is no longer acceptable.[11] Further examinations may be added when abnormalities are detected on the critical series. Maintenance of high technical standards is important in obtaining radiographs in child abuse. One of the most frequent causes of missed or overdiagnosed cases of child abuse relates to poor-quality radiographs. According to the American College of Radiologists (ACR), an imaging system used for suspected abuse should have a spatial resolution of 10 line pairs (lp) per mm and a speed of no more than 200. Although digital or filmless radiology is replacing film screen radiography in many areas, the detail should be comparable to high-detail screen radiography before it can be used routinely for child abuse.[12]

Nuclear Medicine

Radiopharmaceuticals can be tagged and delivered to specific organs. Long scan times are required during imaging by the gamma camera. In young children, sedation is frequently required. Radioisotope doses must be calculated specific to each child's weight to minimize exposure.[13] In addition, potassium perchlorate administration is useful to decrease the thyroid dose in technetium studies.[13]

In child abuse, bone imaging can reveal osseous injuries not identified on standard radiographs[11] or clarify equivocal radiographical skeletal survey findings having a high

index of suspicion for abuse.[8,14] Bone scanning demonstrates abnormalities within hours of osseous injury and can show lesions invisible on plain films.[13] These occult injuries may be nondisplaced traumatic fractures, stress fractures, and periosteal reaction. Injuries in regions difficult to evaluate on radiograph, such as spine and ribs, also can be well documented.[11,13]

The high sensitivity of bone scintigraphy is offset by its low specificity. In addition, lesions adjacent to the growth plate can be missed entirely unless asymmetry is observed with the contralateral growth plate.[13] A high degree of technical precision is required because asymmetric positioning can cause images to appear to have abnormal intensity.

The bone scan delivers a greater radiation dose than plain films, is less readily available, and costs more.[7,11] Most nuclear medicine departments are not experienced in imaging children, and long scan times make patient motion a significant problem. In many cases, radionuclide scintigraphy and skeletal surveys can be used as complementary modalities. If a radionuclide bone scan is performed initially, skull radiographs in at least two projections must supplement the bone scan because scintigraphy is insensitive for detecting cranial injuries.[8]

Computed Tomography

Multislice helical computer tomography (MSCT) should be selected when the choice is available. Images should be evaluated in multiplanar and 3-D formats (**Figures 2-1-a** and **b**). Computed tomography (CT) is the method in evaluating intracranial and intra-abdominal abnormalities.[11] In the acute setting, CT is superior to magnetic resonance imaging (MRI) for the relative ease with which imaging can be performed in the unstable or unsedated patient. Skull and facial fractures can be easily diagnosed with CT. CT is the examination of choice for children with suspected abdominal trauma.[15,16] Specifically, CT facilitates the identification of splenic and hepatic injury in children without significant clinical complaint after blunt abdominal trauma.

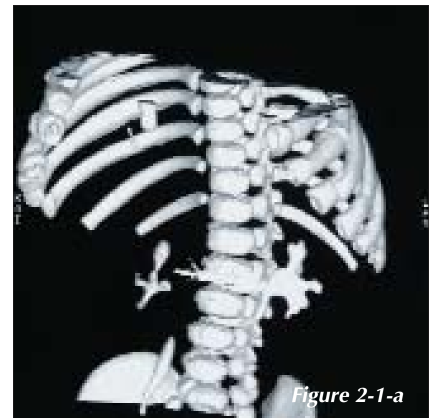


Figure 2-1-a

Figure 2-1-b

***Figure 2-1-a** and **b.** An abdominal isovoxel helical CT scan performed to exclude abdominal injuries also revealed the healing fractures when the skeleton was examined with three-dimensional techniques on the workstation.*

A head CT scan is needed for the evaluation of any child with a positive skeletal survey[11] or as part of the initial evaluation for suspected head injury. It allows specific and sensitive detection of extra-axial fluid collections, intraparenchymal and intraventricular hemorrhage, cerebral edema, or other abnormalities during the acute assessment and for follow-up examination (**Figure 2-2**).[17,18]

Intracranial CT evaluation has some limitations. Small hemorrhages can be missed because of volume averaging. Subdural hematomas and fractures that lie in the plane of section can be missed entirely.[19] Also, CT is relatively insensitive for the evaluation of small posterior fossa subdural hematomas because of extensive artifact.[7,20] These limitations are minimized by multislice CT (MSCT). Changes in the gray–white matter density may be subtle; in addition, incomplete myelination may make the interpretation more difficult. Feldman et al[21] demonstrated that a repeat CT scan within 5 days is very useful in showing evolving infarction or intensification of falcine density that was initially subtle.

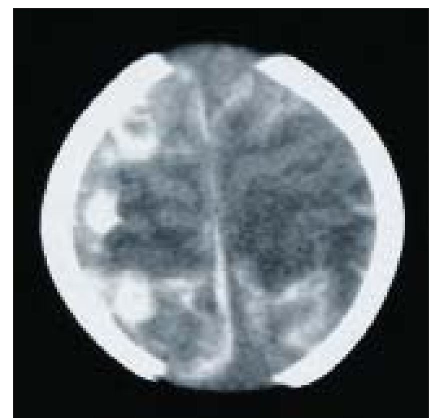


***Figure 2-2.** Two-week-old female with subdural, subarachnoid, and intraparenchymal hemorrhage on multislice (5 mm) cranial CT.*

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI), with its greater anatomical detail, is more sensitive than CT in detecting certain intracranial abnormalities such as subdural hematomas, parenchymal contusions, bleeding, and in determining the age of subdural hematomas.[11,22] MRI has the advantage of multiplanar imaging without ionizing radiation. Coronal planes and the absence of bone artifact improve sensitivity to posterior fossa hemorrhage and subdural hematoma[23] (**Figure 2-3**). Barlow et al[24] demonstrated that the most frequent location for subdural hematoma is the subtemporal area, which is a difficult location to assess by CT.

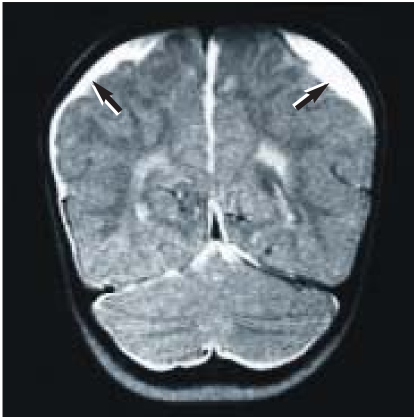


Figure 2-3. *Coronal T2-weighted image demonstrating bright signal in bilateral subdural hematomas along parietal convexities (arrows).*

Table 2-2. Specificity of Radiological Findings

High Specificity
— Metaphyseal lesions
— Posterior rib fractures
— Scapular fractures
— Spinous process fractures
— Sternal fractures
Moderate Specificity*
— Multiple fractures, especially bilateral
— Fractures of different ages
— Epiphyseal separations
— Vertebral body fractures and subluxations
— Digital fractures
— Complex skull fractures
Common, but Low Specificity
— Clavicular fractures
— Long-bone shaft fractures
— Linear skull fractures

**Moderate- and low-specificity lesions become high when history of trauma is absent or inconsistent with injuries.*

In the absence of characteristic CT findings in cases with high clinical suspicion, MRI scans should be done as soon after the presentation as the child's condition allows. T1, T2, and proton density spin echo sequences are needed for the timing of the hemorrhage. FLAIR imaging is optimal because it suppresses the cerebrospinal fluid (CSF) signal and assists in identifying subarachnoid hemorrhages. It also increases the conspicuity of shear injury. Magnetic resonance gradient echo sequences are very sensitive for detecting hemorrhagic lesions not shown by spin echo techniques. New techniques such as diffusion, perfusion, and spectroscopy also assist in the detection, characterization, and timing of injury components, especially diffuse axonal injury and hypoxic ischemia and the evaluation of a stroke.[12,25] MRI also allows the relative dating of subdural hemorrhage, which is useful in differentiating chronic subdural hematoma and ventricular enlargement from atrophy.[11,19] MRI is of greater use in the subacute and chronic phases of the central nervous system (CNS) evaluation of child abuse. Subtle parenchymal injury and edema are seen better on MRI than CT. However, MRI may miss acute—within the first 24 to 48 hours—bleeding and is less sensitive to acute subarachnoid hemorrhage than CT.[21] Overall, MRI remains of limited value in the assessment of acute nonaccidental injury. Thus, MRI imaging should be delayed until 3 to 7 days after injury in affected children.[26]

Long MRI scan times frequently require sedation because the technique is very sensitive to motion artifact. In the acute setting, it is even more difficult to obtain quality MRI examinations. Consequently, CT remains the modality of choice for intracranial injury assessment because of its availability and rapidity of examination in the unstable patient.

Ultrasound

Ultrasound allows the imaging of soft tissues without radiation exposure and is a safe and inexpensive means of examination. Ultrasound examinations are performed rapidly, with sedation rarely needed. In children under the age of 2 years, ultrasound may be used to detect intracranial abnormalities, such as ventricular enlargement, cerebral edema, and intracranial hemorrhage if the anterior fontanelle is still open. While large extra-axial fluid collections are visible, smaller collections may be missed.

Ultrasound is often used as a screening tool in suspected nonaccidental abdominal injury, and the examination can be tailored to evaluate specific organs, such as the liver, spleen, pancreas, or kidneys. Evaluation via ultrasound is of particular use in identifying the sequelae of abuse, such as pseudocysts and pancreatitis.[11] Free fluid or hemorrhage within the abdomen can be readily appreciated using ultrasound, as can retroperitoneal hematoma.[27]

A potential limitation for ultrasound examination is the technical variability that results from the different skill levels of sonographers. In addition, organs can be obscured by ribs and air in the bowel.[7]

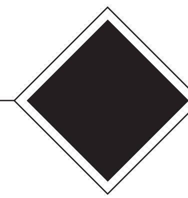
Musculoskeletal Injuries

Types of Fractures/Mechanisms of Injury

Fractures can be subdivided into grouping according to their specificity for child abuse based on their location and nature (**Table 2-2**).

The metaphyseal-epiphyseal fractures include the classically described corner fracture, bucket-handle fracture, and metaphyseal lucency. Recent research has shown that these fractures represent varying appearances of the same injury. They are characteristic of abuse because the force required for this type of injury is greater than that of a simple fall or accident.[27] They can occur in any bone adjacent to a growth plate, such as the clavicle or acromial process of the scapula.

Historically, metaphyseal-epiphyseal fractures were thought to represent avulsion of peripheral metaphyseal fragments at a site of fixed periosteal attachment. It is now



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