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At some point in our lives, most of us will be a patient in a hospital emergency department. Because acute illnesses and injuries of children are always anxiety provoking to parents, children are even more likely to be brought to emergency departments. There they often are placed at risk. They enter an environment that is usually chaotic as the emergency department faces the ongoing challenges of suddenly arriving, acutely ill patients and the pressures of providing care to a large number of awaiting patients, some of whom may have hidden serious disorders. Medical evaluation and transfers tend to be hurried, and handoffs can be limited or inaccurate. In addition, emergency departments in most general hospitals do not have pediatric services sufficiently comprehensive to meet all the needs of children.

To address these challenges, Joint Commission Resources and the American Academy of Pediatrics with Steven Krug, M.D., a senior leader in Pediatric Emergency Medicine, have gathered experts to provide a road map to assure safe care for children in hospital emergency departments. These experts provide guidance to reduce the risks of both active and latent errors. This advice is of great importance to all who work so hard to provide care in the nation’s emergency departments.

Edward S. Ogata, M.D., F.A.A.P.
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When I walked into the emergency department (ED) one Sunday morning, a resident greeted me with a worried look on his face. “Dr. Frush, we have a problem.” He went on to describe an infant who had been cared for in the ED through the night. The young child required treatment with antibiotics after having been brought in by her parents because of a high fever. It had been a very hectic night; the team was short-staffed, a new nurse was being oriented, the resident was working his third straight night shift and it was four o’clock in the morning. As he described later, he was exhausted and felt like he was “hitting the wall.” There was no computerized order entry system, so the resident calculated a dose of an appropriate antibiotic for the child and wrote an order. Before the nurse drew up the medicine she checked his math and got the same (wrong) answer. The infant received 10 times the proper dose of the antibiotic, and the day team had just discovered the error as I was arriving in the ED. I was now the “attending of record,” and it was my responsibility to share this news with the worried parents who had been pacing at their child’s bedside through the night.

One of the most difficult jobs I have as a patient safety leader and a pediatric emergency physician is to disclose medical errors to patients, parents, and families. It’s often a devastating experience; clinicians who have often practiced for years and are vigilant, hard-working, dedicated, and well-intentioned individuals suffer greatly when an error occurs and a child is harmed. Yet this suffering pales in comparison to the anguish endured by parents and families of children who die as a result of a medical error. Amazingly, some parents have been able to turn their family tragedies into powerful motivational messages and programs that help clinicians improve patient safety, and prevent harmful events from occurring to any more children. Sorrel King is one example. After her daughter Josie died as a result of a medical error, she established the Josie King Foundation to “prevent others from dying or being harmed by medical errors. By uniting healthcare providers and consumers, and funding innovative safety programs, we hope to create a culture of patient safety, together.”

Sorrel recently participated on an expert panel at a national meeting of emergency care professionals, drug manufacturers, pharmacists, representatives from government agencies and others who had gathered to develop solutions for safe delivery of pediatric medications, with a focus on children in the emergency setting. National leaders described a number of problems and inherent risks in the highly complex pediatric medication process. Due to a lack of standard pediatric drug formulations, for example, clinicians are forced to calculate individual drug doses for each pediatric patient. Many EDs in our country still lack computerized order entry systems that provide pre-calculated doses, and even those with advanced IT systems have few pre-determined medication doses that are immediately available to clinicians at the bedside in the setting of a life-threatening emergency. Sorrel was dismayed to learn about the inherent risks in the current system, and she implored us to “fix it” so that we can prevent harm to more children. She also reminded us that although advanced technology is important, communication is a true key to safe care. Effective communication requires that we include patients and families when we develop our plans of care; that we really listen to families so that we can hear their concerns; and that we disclose information related to adverse events in a transparent manner in order to maintain a trusting relationship. As Sorrel summarized her remarks, she challenged all of us who were present at the meeting to “figure it out—please figure out all the answers. Please do everything you can to make care safer for children.”
I believe this book is an important part of a larger national effort that is underway to “do everything we can to make emergency care safer for children.” Created through the collaborative work of the American Academy of Pediatrics and Joint Commission Resources (JCR), the educational arm of the Joint Commission (TJC), *Pediatric Patient Safety in the Emergency Department* addresses important topics in pediatric patient safety from the perspective of clinicians who provide front-line care for children in individual EDs (microsystems), and from the broad, systems-based perspective of pediatric healthcare leaders, regulators and educators. The authors describe many different activities and programs that have initiated to “fix the problem” and reduce risk in the pediatric emergency care system. Included are examples of safety improvements and best practices from individual hospitals and institutions (such as safety walkrounds, training to improve teamwork and communication, and tools to improve handoffs and transitions in care), as well as recommendations from large multi-disciplinary healthcare professions groups, such as strategies to decrease the risk of radiation exposure for children undergoing radiographic studies, and guidelines for ED leaders to improve pediatric preparedness. By adopting and implementing these best practices, hospitals and healthcare professionals can achieve safer care and make meaningful changes that will support long-lasting improvements in caring for children in the ED.

This book would not be possible without the leadership, commitment and vision of Steve Krug, M.D., F.A.A.P., who is a champion for pediatric patient safety in the emergency department. Not only has he led changes to improve the safety of children who receive care in the ED where he works, but he has also spent countless hours chairing national committees, leading child advocacy efforts, sharing lessons learned and encouraging colleagues to join the movement to advance patient safety. I hope you’ll join this movement, too, as we continue to do all that we possibly can to make emergency care safer for children.

Karen S. Frush, B.S.N., M.D., F.A.A.P.
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While the Institute of Medicine may have used the word “uneven” in describing the status of pediatric emergency care in the 2006 report, *Emergency Care for Children: Growing Pains*, I prefer to use the analogy of the “perfect storm.” The perfect storm is a massive storm, created by the confluence of more than one weather disturbance, creating a substantially more devastating storm. The contributing weather disturbances in the case of pediatric patient safety in the emergency department (ED) are the following:

- Baseline care quality and patient safety concerns that reside in our existing health care systems
- Patient safety issues that reside in all emergency departments, due to the nature of the environment, typically with numerous competing demands for care providers, high patient acuity, multiple interruptions, language barriers, etc.
- The deleterious influence of overcrowding, which now affects nearly every ED in the United States, further magnifying many of the factors noted above
- The unique characteristics and care needs for children, such as weight-based medication dosing, which further increase the risk for medical errors and adverse events
- Deficiencies in day-to-day readiness in many EDs, such as the absence of equipment for children of all ages and sizes, and the level of experience and/or competency of many emergency care providers in the care of children

This is not to suggest that hospitals or ED care providers are negligent in their efforts to care for children. For many, the 4th and 5th bullets reflect the reality of emergency care in the majority of our nation’s EDs. While children represent approximately 20 to 25 percent of all ED visits nationwide, there exists a relative “pediatric experience gap” for care providers in the majority of EDs. Ninety percent of children receive their care in a non-children’s hospital-based ED, yet 50% of U.S. EDs care for less than 10 children per day. As the majority of children seeking emergency care are thankfully not severely ill or injured, the ongoing experience in the assessment and management of very ill or critically injured children for the clinical staff in these EDs is limited. Even for the relative minority of general ED staff that endeavor to obtain and maintain certification in available pediatric emergency or resuscitation courses (e.g., PALS, APLS, ENPC), it is clear that the knowledge and skills obtained during such courses extinguishes quickly.

So, how do hospitals, clinical managers, and front-line staff navigate this perfect storm? Well, the first step is recognizing the presence of a problem, the experience gap, and opportunities to improve pediatric care quality and patient safety. The second step is making the commitment to improve pediatric emergency care, and in doing so, elevating the emergency care needs of children to the level of institutional priority that will result in the allocation of time and necessary resources to close the gap. As recommended in the 2009 joint policy statement, *Guidelines for the Care of Children in the Emergency Department*, published by the American Academy of Pediatrics (AAP), the American College of Emergency Physicians (ACEP), and the Emergency Nurses Association (ENA), this effort to improve emergency readiness for children of all ages is likely to be successful if it is lead by a physician and nurse coordinator for pediatric emergency care. Performance improvement in pediatric care quality, and the reduction of pediatric patient safety concerns, should be pursued bi-directionally, both ‘top-down’ from hospital leadership and ED managers, as well as ‘bottom-up’ from front-line staff, who are uniquely positioned to identify and resolve safety concerns. The promotion of a “just culture” by an organization’s leadership and ED clinical managers will certainly facilitate this and other patient safety initiatives.
The progress made by a health care organization will be assisted with an awareness of resources such as the AAP/ACEP/ENA policy statement, evidence-based and/or expert consensus driven guidelines and clinical-decision rules, and the growing number of pediatric emergency care resources. In the spirit of adding further to the available resource base for hospital organizations and the thousands of professionals who staff EDs and endeavor to do their best in serving the needs of children and families, the American Academy of Pediatrics and Joint Commission Resources (JCR) have partnered to develop this book, which we hope will provide a sensible and safe path for the many who must navigate this perfect storm.

This book would not be possible without the steadfast commitment of the leadership of both the AAP and JCR to improve pediatric care quality and safety in the ED setting and their desire to partner in this project. Likewise, this resource would not be possible without the outstanding contributions of many patient safety and pediatric care experts from JCR and AAP. Finally, the consistently professional support from AAP and JCR staff was an essential factor toward the completion of a high quality resource. I would also be remiss if I did not acknowledge the influence of the many who continue to inspire me (my family, my division colleagues and our ED staff at Children's Memorial Hospital, the many trainees I have been fortunate to teach [or to learn from], my pediatric emergency medicine colleagues nationwide, and the many children and families I have been privileged to care for) to continue to improve what I do and to do what I can to help/teach/inspire others to do the same. Carpe diem!

Steven E. Krug, M.D., F.A.A.P.
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Emergency departments (EDs) provide a vital service to the communities they serve as a source of life saving care for patients in need. The ED is also an essential component of a health care safety net, particularly for the many patients—including children—who face barriers in efforts to access care through a medical home. As children represent a significant percentage (20%) of patients seeking emergency care, pediatric preparedness in the ED is essential for delivering appropriate and safe care to ill and injured children.

Caring for children in the ED can be quite challenging and is prone to safety concerns due to a number of environmental and human factors. The ED setting is often hectic and chaotic, with frequent workflow interruptions and barriers to effective communication. Most children in the United States—nearly 90%—are cared for in EDs that are located in general hospitals rather than in hospitals dedicated to the care of children. Because a minority of patients in general hospitals are in the pediatric age group, many ED staff may lack familiarity with pediatric emergencies and sufficient opportunities to regularly practice the cognitive and technical skills, such as medication administration, necessary for providing pediatric emergency care.

The Institute of Medicine (IOM) has noted that many hospital EDs are not equally capable of caring for children and adults, and that the needs of children, at times, have been overlooked. The 2006 IOM report, “Emergency Care for Children: Growing Pains”, noted the continued presence of significant deficiencies, including insufficient pediatric emergency care training and continuing professional education for ED staff, and the absence of key pediatric equipment and medications in many EDs. As the majority of EDs in the United States care for less than 10 children per day, the IOM and others have acknowledged the presence of great variability in the on-going pediatric clinical experience for many hospital-based emergency care providers.

In a recent study evaluating clinical performance during mock drills conducted in 35 EDs in North Carolina, including 5 trauma centers, nearly all of the EDs in the study committed significant errors in their efforts to stabilize seriously injured children during trauma simulations. Although all EDs strive to give the highest quality of care to patients no matter what their age, research suggests that a lack of pediatric patient readiness is not unique to EDs in North Carolina. Studies have demonstrated that many EDs may not maintain the full range of equipment necessary to care for children of all ages, and that ED leaders are unaware of published guidelines for pediatric emergency care.

Responding to the need to enhance the day-to-day pediatric readiness of EDs and the quality and safety of emergency care provided to children, the American Academy of Pediatrics, the American College of Emergency Physicians, the Emergency Nurses Association, along with a number of endorsing professional organizations, have published a joint policy statement, Guidelines for Care of Children in the Emergency Department, that specifies the critical components necessary for optimal emergency care for children of all ages. This policy statement identifies necessary ED leadership: equipment, medication and supplies; physician and nurse qualifications; quality improvement and patient safety guidelines; policies, procedures and protocols; and support services that should be in place in every ED. These recommendations, published in October 2009, offer insight into the components necessary for optimal pediatric emergency care and stress the importance that these elements relate to one another to form a more comprehensive and effective pediatric care delivery system.
Is your ED optimally prepared for pediatric patients?

**A Collaboration Between Joint Commission Resources and the American Academy of Pediatrics**

Pediatric patient safety spans the missions of Joint Commission Resources (JCR) and the American Academy of Pediatrics (AAP), which is why these organizations have come together to create *Pediatric Patient Safety in the Emergency Department*.

Designed to help leaders of hospitals and emergency care centers to understand pediatric care needs, integrate the necessary resources, and sustain successful practices to improve the emergency care they provide to children, this book and CD feature discussions, strategies, and tips that focus on the unique needs and concerns of caring for pediatric patients. Reviewed, edited, and authored by experts from AAP and JCR, each chapter focuses on a critical component of caring for pediatric patients in the ED. Chapter topics include:

- Hospital leadership and its impact on pediatric care in the ED
- Communication involving pediatric patients and their families in the ED and beyond
- Promoting a patient and family-centered Environment of Care® in the ED
- Medication safety for pediatric patients in the ED
- Infection prevention and control issues unique to pediatric patients in the ED
- Pediatric patient assessment, diagnostic studies, and treatment in the ED
- Treating children with special health care needs in the ED
- Including pediatric care needs in disaster management

**Overview of the Book**

Chapter 1, “Hospital Leadership and Its Impact on Pediatric Care in the ED,” edited by Richard A. Molteni, M.D., F.A.A.P., and Steven E. Krug, M.D., F.A.A.P., discusses the vital role hospital leadership plays to ensure its emergency department is prepared for pediatric patients. Chapter topics include the following:

- Emergency medical services for children
- The front door of the hospital organization
- The essential role for pediatric care leadership and advocacy in the ED
- Forming a LILY team
- Planning and budgeting for pediatric care

Chapter 2, “Communication Involving Pediatric Patients and Their Families in the ED and Beyond,” edited by Tony Woodward, M.D., M.B.A., F.A.A.P., addresses the essential need for clear and effective communication throughout an organization, and specifically focuses on:

- Encouraging communication between ED professionals
- Strengthening initial (pre-admission or pre-arrival) communication
- Gaining the trust of patients and families

Chapter 3, “Promoting a Patient and Family-Centered Environment of Care® in the ED,” edited by Francine Westergaard, R.N., M.S.N., M.B.A., stresses why organizations should strive to create a patient and family-centered environment of care and features discussions on the following:

- Adopting family-centered care in the ED
- Supporting family presence during all aspects of care
- Providing comfort for children in distress
- The collaborative health care team
- Improving pediatric patient safety in the ED

Chapter 4, “Medication Safety for Pediatric Patients in the ED,” authored by Jeannell Mansur, Pharm.D., F.A.S.H.P., offers key information on ways to ensure that ED medication safety policies and practices address the specific needs of pediatric patients. The chapter focuses on the following:

- Medication reconciliation
- Medication safety in the ED: addressing the fundamentals
- Requirements for labeling medications
- Safe medication prescribing for children in the ED
- Relying on pharmacists in the medication use process
- Using technology to enhance pediatric medication safety
- Prescribing home-going medications from the ED
- Monitoring and managing pediatric sedation and analgesia
- Pain management

Allen, M.D., F.A.A.P., addresses infection prevention and control issues specific to pediatric patients and focuses on the following:

- General principles of infection control
- Surveillance
- Bioterrorism
- Pandemic influenza
- Specific infection control scenarios

Chapter 6, “Pediatric Patient Assessment, Diagnostic Studies, and Treatment in the ED,” authored by Steven E. Krug, M.D., F.A.A.P., discusses what EDs can do to ensure they are prepared to assess, diagnose, and treat children. The following topics are included:

- Customizing the emergency care process for children
- Determining when to proceed with diagnostic testing
- Developing emergency care practices that involve patient families
- Assessing the risks and benefits of medical imaging for children
- Being prepared for pediatric trauma
- Anticipating the interfacility transfer of pediatric patients
- Maintaining vigilance for non-accidental trauma and child maltreatment
- Mental health emergencies in children and adolescents
- Adopting an evidence-based approach to pediatric emergency care

Chapter 7, “Treating Children with Special Health Care Needs in the ED,” edited by Loren G. Yamamoto, M.D., M.P.H., F.A.A.P., outlines issues specific to caring for children with special health care needs and offers discussions on:

- Understanding the unique issues in caring for children with special health care needs
- Supporting care coordination
- Managing devices and equipment malfunction in special needs children
- Developing a disaster plan for children with special needs
- Resources for emergency care providers

Chapter 8, “Including Pediatric Care Needs in Disaster Management,” authored by Francine Westergaard, R.N., M.S.N., M.B.A., Mary Lacher, M.D., F.A.A.P., and Steven E. Krug, M.D., F.A.A.P., focuses on the importance of why EDs should include the needs of pediatric patients in their disaster management plans. The chapter discusses the following topics:

- Understanding the unique differences in the pediatric patient
- Addressing the needs of unaccompanied children and families
- Planning for children in a mass casualty event
- Communication
- Patient triage
- Decontamination
- Acute care capability and surge capacity
- Staff qualified to provide pediatric care

Also included, “List of Abbreviations” provides a complete list of terms and their corresponding acronyms or abbreviations used throughout the book.

How to Use the CD
Throughout Pediatric Patient Safety in the Emergency Department, there are checklists, forms, quick reference tables, and other tools used to enhance the care of pediatric patients in the ED. Many of these tools are included in the attached CD and may be adapted to the needs of your organization. These tools are identified throughout the book with a small CD icon.

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References