Safety in Caring for Children and Families

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CHAPTER 3 Essential Safety Models

Essential Safety Models

LEARNING OBJECTIVES

1. Apply the goals of national safety initiatives for children and their families in nursing practice.
2. Analyze how the Quality and Safety Education for Nurses (QSEN) competencies relate to direct care of children across clinical settings.
3. Incorporate safety principles into anticipatory guidance offered to parents, educators, and caregivers.
4. Analyze and apply principles of safety in the various nonclinical settings such as the home, school, daycare, and play areas.
5. Identify and apply setting-specific methods to reduce the frequency of medical and medication errors in pediatric nursing care across settings.
6. Identify and apply methods to both prevent the major types of errors in pediatric care and reduce the impact of these errors on families if they do occur.
7. Evaluate how various communication tips and concept thinking can provide a safer environment for children across clinical settings, including handoff protocols and mnemonics.

KEY TERMS

Concept-based learning
Evidence-based practice
Holistic
Informatics
Mnemonics
Quality and Safety Education for Nurses (QSEN)
Special needs

Introduction

The concept of safety within pediatrics is a key component of **holistic** (i.e., caring for the whole person, including not only his or her medical condition, but also any mental, social, and environment concerns) and comprehensive pediatric nursing care. Young children are inherently unsafe and require more than just supervision; that is, they require safe environments in which to play, grow, develop, and thrive. They require responsible adults to provide anticipated safety measures at home and in day-care, school, and playground settings, and they require an emerging sense of safety within that manifests as safe decisions as they mature. Neither infants nor young toddlers can be expected to understand what is "safe" and what is "unsafe," but by a child's third birthday, there should be a basic understanding that certain behaviors will put the child in harm's way.

Many national organizations have developed safety guidelines for children of all ages. Pediatric nurses are in the unique position of being able to discuss safety regardless of the clinical setting in which they see a patient. The Society of Pediatric Nurses, American Academy of Pediatrics, and Association of Critical Care Nurses all promote safety as a high priority. Being an excellent safety role model is one of the most important responsibilities of the pediatric nurse, so as to teach families, caregivers, teachers, and children what is and is not safe, and how to plan for safety (advice given as part of anticipatory guidance). The pediatric nurse is instrumental in demonstrating safe care for children all across the developmental period, including those with **special needs** (i.e., disabilities in medical, psychological, or mental functioning that affect a child's development), such as developmentally disabled or medically fragile children. This chapter discusses pediatric safety concerns and provides guidance on how to plan ahead for safe environments for children.

National Safety Initiatives

Every year, a staggering number of children experience significant unintentional injuries. Children are exposed to a large number of risks and hazards while they grow, learn, and explore their environments (**Figure 3-1**). Notably, their inexperience and curiosity contribute to many childhood injuries. Most injuries across childhood occur in the following general areas:

- Falls
- Burns related to heat and fire
- Motor vehicle accidents as either a pedestrian or a passenger
- Suffocation, asphyxiation, or choking

Figure 3-1

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- Drowning or near drowning
- Sports, recreation, and related injuries
- Poisoning

Multiple national safety initiatives have been created to provide a safety structure for those persons caring for children. Each year, approximately 9 million children seek care in U.S. emergency departments for injuries; 225,000 children require hospitalization for injuries; and 9000 children die (Centers for Disease Control and Prevention [CDC], 2015). Both governmental bodies and professional organizations have published guidelines to conceptualize and anticipate safety concerns for children.

QSEN Competencies

One of the most recently introduced national initiatives for nurses on safety across the lifespan is **Quality and Safety Education for Nurses (QSEN)**. The QSEN project was launched in 2005 to address some of the challenges encountered when trying to prepare nurses for professional practice (Cronenwett et al., 2007; Dolansky & Moore, 2013; Sherwood & Zomorodi, 2014). The project, which is funded by the Robert Wood Johnson Foundation, focuses on the knowledge, skills, and attitudes needed to consistently and continuously improve the practice of professional nursing. Multidisciplinary teams worked collaboratively to create guidelines for six competencies: patient-centered care, **evidence-based practice** (best practice based on the integration of clinical expertise, scientific evidence, and the patient's and family's perspectives), quality improvement, teamwork and collaboration, **informatics** (the application of information and computer science to health care), and safety. The founders partnered with organizations that represent current practice and proposed a set of knowledge, skills, and attitudes required for safe nursing education and practice. **Table 3-1** summarizes the main safety competencies within this initiative.

TABLE 3-1   QSEN Competencies: A Summary of Application to Pediatrics

1. **Patient-Centered Care**: Recognizes the family as a full partner in care and the source of control for the child, and provides compassionate coordinated care based on a foundation of the child's and family's needs, preferences, and cultural practices/values.

   Knowledge: Pain theory, ethics, legal implications, effective communication principles, cultural care, care for specific forms of special medical or behavioral needs.

   Skills: Assessment of pain or suffering, providing emotional support, coordinating care needs, applying effective treatments and nursing interventions, facilitating informed consent, resolving conflicts, recognizing the need for boundaries, and providing comprehensive safety.

   Attitudes: Valuing partnerships; acknowledging tension; appreciating shared decision making; respecting individual expressions of values, needs, and preferences; and recognizing the need to continuously improve one's own conflict and communications skills.

2. **Evidence-Based Practice**: The investigation, application, and integration of the best current evidence found for the improvement of clinical expertise and family preferences.

   Knowledge: Know the scientific research process, apply principles of literature searching and critiquing, secure reliable and reputable sources of information, and discriminate between best published practices and current clinical practice.

   Skills: Apply skills of data collection, research review, criticism, and protocol revision.

   Attitudes: Appreciate scientific-based practice and the importance of frequent assessment of relevant and accessible knowledge.

3. **Quality Improvement:** Consistently monitor outcomes of care and use methods of change to improve all aspects of the safety and quality of healthcare systems.

   Knowledge: Learn about outcome theory, recognize the parts of systems that can be reviewed, validate processes of outcome measurements, and learn how to approach making changes in care within systems.

   Skills: Use the outcomes of quality improvement projects, participate in such projects, identify gaps in best practice, and apply new skills to care scenarios.

   Attitudes: Appreciate the importance of quality improvement projects, value measurement skills, and be open to change.

4. **Teamwork and Collaboration:** Within nursing and interprofessional teams, the nurse functions effectively, fosters strong open communication, promotes mutual respect, and applies the principles of shared decision making to the team members and to the combination of the family and team members.

   Knowledge: Describes the scope of practice, the roles of team members, and personal strengths and limitations, and understands the impact of team function and communication on the outcome of patient safety and quality of care provided.

   Skills: Initiates a plan for self-improvement, functions within the scope of practice, integrates the skills and contributions of team members, and solicits input from members of the care team.

   Attitudes: Appreciates the importance of teamwork, values the perspectives of others, and respects team members' unique attributes.

5. **Informatics**: Communicate using information technology that assists with managing knowledge and supports decision making.

   Knowledge: Understand the importance of information and technology, describe how technology and information management improve quality and safety, and understand the time and skill needed to effectively use the tools.

   Skills: Seek information and technology skill improvements, navigate the technology using the assistance of others, and use the information generated to understand and improve patient outcomes.

   Attitudes: Appreciate the need for lifelong learning that continuously provides opportunities for improvement and change, and value the care coordination, error prevention, safety improvements, and decision making that information and technology provide.

(continues)

TABLE 3-1   QSEN Competencies: A Summary of Application to Pediatrics *(continued)*

6. **Safety**: Maximize assessment of safety issues and minimize risk of harm to patients.

   Knowledge: Describe unsafe practices (poor communication, use of do-not-use abbreviations, and work-arounds), discuss strategies to effectively reduce reliance on memory, and describe factors that promote a culture of safety for individuals, teams, and healthcare systems.

   Skills: Use technology, practice new methods of error reduction, communicate unsafe practices, engage in root-cause analysis, and participate in designing safe systems.

   Attitudes: Value the creativity and contributions of safety measures, value the nurse's own role in error prevention, and value vigilance, monitoring, and implementation strategies.

Data from QSEN Institute. (2014). Pre-licensure KSAs. Retrieved from http://qsen.org/competencies/pre-licensure-ksas

Thinking in Concepts to Promote Safety

Applying the QSEN competencies to pediatrics provides a holistic foundation for safety, but the care of children also requires a thinking process whereby the nurse reflects on the knowledge needed to predict a child's care requirements; the skills required to provide safe, evidence-based holistic care; and the attitudes assumed by a pediatric nurse who is committed to change and improving quality and safety in all aspects of care. Given the vast amount of knowledge that a pediatric nurse must have to function with competency and safety, nurses can feel overloaded with information. The application of **concept-based learning**—a dynamic approach to the ever-growing body of scientific nursing knowledge that focuses on learning key concepts that can be applied to various situations and settings—promotes building a mental bridge between large quantities of factual knowledge and conceptual understanding. These bridges allow one to rely less on facts and more on organizing concepts that create mental links. Instead of memorizing facts and trying to retrieve them, the nurse uses concepts to quickly link and integrate information within patient scenarios to provide "the big picture." Safety as a concept is widely used to promote a cascade of thinking about identifying harm, reducing errors, and promoting safety. Thinking conceptually about safety allows the nurse to readily transfer existing knowledge to an actual clinical situation (**Figure 3-2**).

Safety, as a concept, reflects the many needs of a person. By studying exemplars of clinical situations and thinking through the components of safety present in those scenarios, the nurse can improve his or her rapid application of integrated safety knowledge. For instance, if a nurse encounters a child with developmental delay who has a new postoperative incisional wound, cannot provide basic care for herself, and requires many treatments and medications, the nurse can use the concept of safety to think about all of the safety concerns that might arise for the child. These concerns include the

Figure 3-2
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following questions: What is the best way to prevent the child from touching the wound or pulling out sutures in light of her developmental delay? How can the child's caretakers best avoid medication errors or interactions in the medications used for her postsurgical therapy—and what are the potential risks of such mistakes? How can the nurse ensure that the child's pain is adequately treated in light of her special needs? How can these concerns be addressed both in the clinical setting and in the home after the child is discharged? Using safety as a concept in care should trigger a cascade of potential and actual concerns for the child. When such a conceptual lens is not used, the nurse must rely on memorization and superficial thinking and is unlikely to develop the deeper understanding that accompanies integrated thinking (Miller, 2012).

Conceptual Thinking: Pediatric Safety

- Definition of the concept: The minimization of harm to both patients and providers through safe individual practice and safe effective systems.
- Prevalence and populations at risk: Pediatric patients from birth to adolescence.
- Personal risk factors: Identifying personal aspects that may increase error or harm.
- Mechanism and consequences: Outcomes of unsafe practice or unsafe environments/systems.
- Clinical manifestations: Medical and medication errors, bodily injury, acts of omission and commission.
- Clinical management: Application of safety models, practices, and protocols with continuous quality improvement processes to evaluate best practices.
- Interrelated concepts: Development, ethics, accountability, advocacy, effective communication, and professional behavior.
- Concept exemplars: The study of clinical cases that illuminate the components of safety (i.e., a clinical case of child abuse and severe neglect of a young child who relies on others to provide all aspects of nutrition, elimination, warmth, hygiene and safety) (Miller, 2012).

Another safety issue present in contemporary pediatric nursing is the identification of neglect. Children can suffer safety issues associated with intentional or unintentional neglect of their basic needs. According to Mennen, Kim, Sang, and Trickett (2010), child neglect is most prominent in families who are considered child welfare clients. Neglect for these high-risk families was found to be 71.0% with 95% of the cases associated with other forms of child maltreatment. Pediatric nurses must associate cases of child neglect with other forms of safety issues and assess for other forms of child abuse.

Model of Thinking: Basics of Safety During Specific Developmental Stages

Children between 1 and 4 years of age and adolescents age 15 and older have the highest rates of accidental injuries in the United States. According to the CDC (2016), boys are twice as likely as girls to die from accidents associated with unintentional injuries. The younger the child, the greater the chance the injury will be related to transportation (pedestrian, motor vehicle, or bicycles) or related to drowning or burns. Infants and toddlers are at greater risk for aspiration, choking, or poisoning deaths. Young children have newly mastered locomotion, yet have no real sense of danger versus safety—factors that put them at high risk of accidents.

Injury prevention and safety education for families based on the child's specific developmental stage is a nursing imperative. Such education should also incorporate the special needs of children with intellectual or physical disabilities. **Table 3-2** lists injury prevention topics based on developmental stage that should be discussed with families.

Identifying and Addressing Safety Issues in the Community

A child's environment can be a source of safety concerns. Industrialized areas contain hazards in the air, water, and soil. Urban households in high-traffic zones may be exposed to automobile-related hazards due to both increased risk of pedestrian accidents and poor air quality. The pediatric nurse must assess a family's concerns about the environment in which the child lives (**Figure 3-3**). Areas to assess include the following:

- *Water contamination.* Water contamination is a global concern for children. In the United States, contaminated well water is a threat monitored by the National Institute of Environmental Health (Mishamandani, 2015). Arsenic-, lead-, and mercury-contaminated water can affect a child's cognitive development and behavior. Dirty and contaminated water is considered the planet's biggest health threat to children (National Resources Defense Council, 2015).
- *Lead poisoning.* Children can be exposed to lead through water, food, air, deteriorating paint, dust, and contaminated soil. Although use of lead is now banned in both gasoline and paint products, lead poisoning remains a serious safety concern owing to lead's persistent presence in the soil, old paint, industrial emissions, and air. Health effects of lead exposure may include delays in mental and physical development, increased behavioral problems, and short attention span. Younger children are more sensitive to the damage of lead exposure as their bones grow and tissues are more susceptible.
- *Air quality.* According the U.S. Environmental Protection Agency (2017), millions of children live in areas where air quality poses potential and actual serious threats to their health with low-income families and communities of color being at high risk. Air pollution is linked to development of bronchitis and asthma, with these conditions being especially prevalent in urban areas with heavy traffic (Milligan, Matsui, & Sharma, 2016). Asbestos—a mineral fiber used in building construction materials, insulation, and fire-retardants—has detrimental health effects as well. Second-hand smoke poses serious health risks for children in both the short

TABLE 3-2   Developmental Stage–Related Injury Prevention

Young Infants

› Prevent aspiration and choking by diligently stopping the infant from reaching toys smaller than the diameter of the center of a toilet paper roll.

› Keep plastic bags away from their reach.

› Strap infants down for diaper changes; never leave an infant on a surface where the child could roll and fall.

› Do not ever drink hot liquids while holding an infant.

Older Infants

› As infants become mobile, prevent falls and injuries related to stairs and poisonings as they move and explore their environments.

› Never leave a child unattended in a high chair, shopping cart, or motor vehicle.

› Make sure older infants are provided with foods that they can eat safely. Do not give hard foods such as carrots, and chop soft foods up into very small pieces.

Toddlers

› Prevent falls, drowning, electrical burns, and heat burns by providing constant supervision while the child is awake, at play, and outside.

› Do not allow toddlers to climb on surfaces or chairs to reach desirable items.

› Use safety gates, window guards, cabinet locks, and toilet seat locks throughout their environments.

› Turn pot handles toward the back of the stove.

› Do not allow toddlers near unsupervised pets.

› Have toddlers wear helmets while learning to ride a tricycle.

› Do not leave electrical appliances plugged in and do not let electrical cords hang down.

› Teach toddlers what "hot" and "danger" mean.

Preschoolers

› Teach preschoolers about car/pedestrian safety.

› Require preschoolers to consistently wear safety devices such as helmets, padding, and straps.

› Never call medicine "candy."

› Continue to use safe barriers, safety gates, and locked cabinets.

› Teach animal safety.

› Teach and practice saying "no" to others when in an uncomfortable situation or environment.

School Age

› Teach school-age children fire safety.

› Keep matches stored in a safe area.

› Insist on seat belt safety and sports safety devices.

› Teach about car safety, stranger safety, and animal safety.

› Practice a fire escape plan and a natural disaster plan.

› Teach Internet safety.

Adolescents

› Role model safety, as teens will mimic and follow what adults do in most situations. Wear seat belts, do not participate in substance abuse, and do not smoke.

› Talk frankly with teens about sex, drugs, alcohol, and risk taking.

Special Needs

› Identify safety concerns particular to the mental, emotional, or physical impairment of a special-needs child (e.g., the need for a 504 Plan or individualized education plan [IEP] in school).

Figure 3-3
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and long terms; notably, it is directly linked to development of ear infections, bronchitis, asthma, and sudden infant death syndrome (SIDS) (Treyster & Gitterman, 2011).

- *Sun exposure.* Most lifetime sun exposure occurs in the first 18 years of life. Children must be protected from the harmful consequences of lengthy sun exposure and sunburns, as these events are directly linked to development of skin cancer, premature aging, inflammation of the cornea and conjunctiva of the eye, accelerated cataract development, and effectiveness of the immune system (World Health Organization, 2001).

RESEARCH EVIDENCE

Well Water Contamination and Intelligence

The U.S. Environmental Protection Agency has found that children who are exposed to drinking water containing levels of arsenic greater than 5 µg/L experience a reduction of 5–6 points in most aspects of measured intelligence. Arsenic, which is naturally found in the groundwater in certain geographic areas, can have serious health consequences for children, including increasing their risks of neurodevelopmental disruption, diabetes, and cardiovascular disease (Wasserman et al., 2014).

Safety at Home

Children live in a variety of settings—rural, farm, urban, and suburban. Socioeconomic factors play a large role in determining the safety of the environment in which a child lives. Unsafe neighborhoods where crime, drug trafficking, and unemployment levels are high create greater safety concerns for children. According to the National

Center for Children in Poverty (2016), in 2014, 32% of U.S. children lived in a family at the poverty level—defined as a household with income less than $24,008 per year for a family of four. Forty-eight percent of children live in low-income families.

Clinicians should be aware of and screen for the many health and safety issues related to poverty (Chung et al., 2016). Families from lower socioeconomic backgrounds may have safety issues associated with their residence in lower-income neighborhoods, exposure to crime, and risk of substance abuse (Consumer Federation of America [CFA], 2013). Lower-income homes may lack supervision, as not all working parents can afford complete childcare coverage. Children from lower-income households also have more chronic illnesses such as asthma (Clark et al., 2015), reduced access to routine preventive health care (Center for Poverty Research, 2014), and greater risk of unintentional injuries generally as well as specifically from pedestrian, fire, burn, drowning, and fall injuries than do other children (CFA, 2013). Poverty exacerbates concerns such as food insecurity and exposure to environmental hazards such as lead paint, which may affect child development (Chung et al., 2016).

The pediatric nurse should be aware of the various resources available within the community and refer families in need to specific community organizations that can provide needed assistance. These resources may include low-cost childcare services or early childhood education programs such as Head Start, public health clinics, low-cost immunization clinics, community-based safety fairs, food banks, and community kitchens where free or low-cost meals can be secured.

RESEARCH EVIDENCE

Children who have been diagnosed with attention-deficit/hyperactivity disorder (ADHD) are at a much greater risk of injury than children without ADHD, as they are distracted quite easily and experience more motor vehicle-versus-pedestrian accidents. Research has shown that although they may follow curbside behaviors, children with ADHD are at a higher risk due to their failure to process safety factors while crossing streets and are especially prone to choosing small traffic gaps while crossing (Nikolas et al., 2016).

One major concern for families who cannot afford after-school care is "latchkey" children, referring to children who are not supervised by a responsible adult after school. The percentages of latchkey children have been reported as 2% of 8-year-olds, 4% of 9-year-olds, 6% of 10-year-olds, 11% of 11-year-olds, and 14% of 12-year-olds (Bureau of

- Ask a trustworthy neighbor or friend to be a backup.
- Reinforce self-protection by locking windows and doors.
- Keep keys handy but out of sight (do not wear house keys around neck).
- Provide and support after-school activities.
- Set clear rules as to what is expected regarding friends, food preparation, screen time, and homework.
- Set controls for media, TV, and computers.

Creating a safe home environment for children is considered paramount, though the specific risks differ to some extent for boys and girls. Girls typically experience injuries within the house (burns, falls, and bodily injury), whereas boys experience injuries outside or in garage or storage areas (burns, suffocation, drowning, and bodily injury). Preparing the home environment requires understanding the physical and mental capacities of children across the developmental period. Emergency preparedness, fire safety (**Table 3-3**), and knowledge about medication safety are key areas where families need

Figure 3-4

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the Census, 1991). Approximately 10% of children age 4–12 years in 2013 spent 3 or more hours alone on each school day, and 51% of latchkey children showed poor academic performance (Lant, 2013). Latchkey children have increased safety risks, including unsafe food preparation and cooking, unsupervised computer play, unsupervised social contacts, and emotional concerns such as fear, loneliness, stress, and feelings of abandonment (**Figure 3-4**). Overall, they are twice as likely to participate in drugs and sexual activity as children who have adult after-school supervision (Lant, 2013).

One model of safety proposed for latchkey children includes the following measures to decrease their risks (Lant, 2013):

- Have consistent contact times during the unsupervised time at home.
- Have unannounced visits or come home early without notice.
- Assign chores and praise the child for completing responsibilities.

TABLE 3-3   Prevent Burns Through Fire Safety
› Teach the family a fire escape plan and practice fire drills as a family.
› Keep the fireplace clean and safe with tight-fitting screens or doors.
› Keep fire extinguishers up-to-date and check their expiration dates annually.
› Know how to use a fire extinguisher.
› Use safe, reliable, and double-checked smoke detectors in each room.
› Store lighters, matches, candles, and cigarettes away from children.
› Store gasoline or any flammable substances away from children, heat, and sparks. Do not store them in accessible locations.
› Keep children out of the kitchen while cooking, use safety gates as needed, and cook on the back burners only.
› Do not store food in cabinets above the stove or oven.
› Keep children away from gas or charcoal grills or outdoor fireplaces or pits.
› Teach children how to "stop, drop, and roll," and practice this technique often.

anticipatory guidance, as these issues affect all children. For example, an estimated 500,000 children younger than 5 years of age accidentally ingest medications each year. Approximately 15% of these victims end up in the emergency department—one child every 8 minutes—and 70% of these patients are children age 2 years or younger. (Safe Kids Worldwide, 2012a, 2012b)

A study in the *Journal of Pediatrics* examined more than 540,000 cases of children younger than age 5 who were treated in an emergency department for medicine poisoning over a period of 8 years. Nearly 95% of single-agent poisonings were self-administered—that is, the child ingested medications kept in an unsafe location such as an open bottle, open purse, bathroom counter, kitchen counter, table, or shelf—and 55% involved prescription medications belonging to a parent or grandparent, such as oral hypoglycemic agents, opioids, and sedatives. The authors concluded that the inadequacy of safety measures intended to keep medications out of children's hands was a significant factor in these outcomes (Bond, Woodward, & Ho, 2011).

Children are at high risk for emergency hospitalizations when they have access to and ingest prescription medications in the home (Lovegrove, Mathew, Hampp, Governale, Wysowski, & Budnitz, 2014).

FAMILY EDUCATION

Home Preparation for Emergencies

- Keep a clear and easy-to-read large-print record of emergency numbers, including phone numbers for law enforcement, poison control, the local hospital, pediatricians, 911, and a local taxi service.
- Have all members of the family who are old enough take cardiopulmonary resuscitation (CPR) classes; recertify often.
- Keep emergency flashlights, matches, and candles handy but out of reach.
- Keep a well-stocked first-aid kit.
- Take the American Red Cross first-aid course; recertify often.
- Maintain an appropriate emergency supply box in case of flood, fire, earthquake, or other regional emergency. Stock this box with water, food, clothes, space blankets, candles, matches, medications and copies of prescriptions, extra eyeglasses, pet supplies, and solid shoes for all members of the family.
- Know the location of the gas, water, and electrical emergency shut-off switches.
- Teach children how to call 911.
- Have a family plan for where to meet and how to reach one another if an emergency happens.

Prevention of Poisonings at Home

- Post the poison control center's number by the phone and near poisonous materials and substances (**800-555-1212**).
- Keep medications in the original child-proof containers—never in unlabeled pill organizers or in purses, briefcases, or other storage areas where children are interested and have access.
- Do not ever call medications "candy."
- Store all chemicals, cleaning agents, and paint supplies in locked cabinets.
- Keep all plastic bags (kitchen, dry cleaning, and packaging materials) away from children.
- Keep potentially harmful materials and substances in their original packaging with clear labels, and make sure they have tight child-safety lids.
- Materials such as cleaners, vinegar, or bleaches with ammonia should never be used or stored together.
- Keep poisonous and toxic substances locked up *and* out of reach of children.
- Do not store gasoline in the garage.
- Be consistent with children about not touching anything stored, locked, or dangerous.

Medications and Substances for Poisonings

Recommendations are to call the poison control center (**800-222-1222**) for guidance.

- *Ipecac syrup* is an emetic that, when taken with a quantity of water, induces vomiting. Its long shelf life has left many households with the medication available, but it is not recommended for poisonings.
- *Charcoal* is an adsorbent used in patients with intact airways to adsorb (bind) toxic substances in the stomach. After charcoal is ingested, a nasogastric tube should be used to lavage the toxin or substance as rapidly as possible.

FAMILY EDUCATION

Motor Vehicle Restraints: Applying Safety Across Childhood

Anticipatory guidance on state car seat laws is one of the most important discussions that can take place between a pediatric nurse and the families the nurse serves. Motor vehicle accidents (MVAs) are a leading cause of injury and deaths for children between 1 year and 12 years of age. Of the 638 children younger than 12 who died from MVAs in 2013, nearly 40% were not wearing seat belts (CDC, 2013).

Numerous resources are available for explaining to parents how car restraints should be used for different age groups.

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Websites such as http://www.dmv.org and https://www.safercar.gov/parents/index.htm clarify a multitude of safety issues related to children in and around cars. In addition, numerous YouTube videos show how to install car seats correctly, and many local police or fire departments are willing to inspect car seats and assist parents with their correct installation. Nurses should keep a list of such resources available for guiding parents.

Talking to Parents About Car Safety

- Children should not be left alone in a car if the keys are in the ignition.
- Children younger than age 7 should never be left in a car without a person who is at least 12 years old.
- Drivers must be careful to "look before they lock," as heatstroke from leaving a quiet or sleeping child in a locked car with the windows up can be fatal.
- Children need to be taught about blind zones because of the risk of "frontovers" and "backovers"; discuss the blind zones of a car.

Parents must know how to properly and safely install a car seat. Double-checking that the car seat or booster seat is belted into the car, and not just the child into the car seat, can save lives.

Safety at Daycare Centers and Schools

Daycare programs, preschools, and schools should all be a safe place for children to play, learn, and thrive. Each setting, whether private or public, should have safety procedures that are written down and periodically reviewed. Nurses can be instrumental in reviewing facilities, playgrounds, procedures, sports equipment, and safety devices for safety deficiencies. Playgrounds should have shade, soft padding under climbing structures, safety fences to prevent wandering or intruders, and supervision between classes and during breaks and recesses. Policies should include safety procedures for when children are departing the facility, whether accompanied by a parent, riding on a school bus, or walking or biking home by themselves. Policies should also cover caring for an injured child and protocols for administering first aid; at least some personnel supervising children should have specific first aid and CPR training. Emergency phone numbers for fire, poison control, and 911 calls for ambulance and police should be posted in all rooms of all buildings. Policies against bullying, violence, drugs, smoking, and alcohol should be enforced.

Safety at Play

Children need guidance and supervision while at play. Nurses, in turn, should provide support and anticipatory guidance to families concerning safe play. Each developmental stage is associated with its own set of fine and gross motor milestones, and play activities can promote the achievement of those milestones. Promoting safety during play includes being aware of the potential injuries or accidents that can occur, and providing rules and structure to prevent them. The following list outlines concerns that should be anticipated during play:

- Children must consistently wear protective gear and helmets (e.g., during skateboarding, biking, snow sports, contact sports, and extreme sports).
- Supervision must be provided to prevent deviations from sports rules (e.g., young children swimming without life vests or safety floatation devices).
- Climbing structures should be free of splinters, loose screws, or nails, and should have padding or soft material underneath for protection during falls.
- Children should not be allowed to play on equipment, bikes, or other devices not made for their age or developmental level (e.g., toddlers on skateboards).

Preventing Injuries During Sports Activities: Anticipatory Guidance for Parents

- Role-model safety by always wearing seat belts, sports safety gear, and helmets.
- Insist on children of all ages wearing safety gear appropriate to the sport.
- Check for proper fitting; as children grow, they will need larger sizes.
- Provide mouth gear and safety devices for protecting teeth.

Safety in Clinical Settings

Hospitals

Hospitals are inherently unsafe places for children. Hospital environments are often fast-paced, chaotic, filled with acutely or critically ill patients, busy with a host of healthcare professionals, and populated with complicated security measures. It is the pediatric nurse's priority to provide a safe environment to hospitalized children—and doing so effectively takes concerted effort (**Figure 3-5**). Environmental sweeps for safety concerns need to be conducted on every shift, and prompt reporting of unsafe conditions,

Figure 3-5

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TABLE 3-4   Checklist for Keeping Children Safe in the Hospital
› Ensure young children have an alert system such as a bracelet or anklet that emits an alarm when the child leaves the premises or comes close to stairwells and elevators; check frequently that the device is intact and operational.
› Cover all electrical outlets and minimize the presence of electrical equipment.
› Never leave unsafe items at the bedside or crib, including scissors, medications, hemostats, needles, or sharps of any form.
› Double-check that crib rails are clicked into place and side rails are up.
› Select beds that are safe for the child's age, developmental stage, and size (e.g., high-top covered cribs for young children who stand).
› Do not allow parents to sleep in hospital beds with their infant.
› Assess infants and toddlers for strangulation injuries related to wires, tubes, and monitoring equipment.

Rates of Medical and Medication Errors in Pediatric Care

Medical errors are responsible for more deaths among adults and children alike than motor vehicle accidents, according to Bleich's (2005) report from the Commonwealth Fund. While the majority of medication errors occur in adults—as many as 14 errors per 100 doses—children experience from approximately 2.3 to 6 adverse drug events per 100 hospital admissions (Sharek & Classen, 2006). Pediatric medication doses must be calculated using a weight-based measurement (such as milligrams per kilogram or milligrams per body surface area) and double-checked for safety. Due to the need to calculate doses individually for children, pediatric patients are up to three times more likely to experience "near-miss" errors (Kaufmann, Laschat, & Wappler, 2012; Kaushal et al., 2001).

Some pediatric institutions require that all medications administered to children be subjected to double-checking by nursing staff members against documentation and electronic/written signatures (**Figure 3-6**). Examples of medications/infusions for which pediatric registered nurses may be expected to double-check the rights of medication administration (right patient, drug, dose, time, and route) include the following therapies:

- Cardiac medications such as antihypertensives and antiarrhythmics (digoxin)
- Blood products
- Insulins and hypoglycemics
- Total parenteral nutrition and intralipids
- Chemotherapies and any medications associated with cancer treatments

broken equipment, or safety breaches is required. It is everyone's responsibility to prioritize safety for children in the hospital. Young children are particularly vulnerable to adverse effects as they explore their environment and test limits (**Table 3-4**).

Four major issues have been identified that put hospitalized children at greater safety risks (Lacey, Smith, & Cox, 2008):

- A child's fluid developmental status, as new milestones are implemented and boundaries are tested
- The dependency level inherent to children, especially the nonverbal status of young children
- An acute (rather than chronic) episode, which leads to a higher level of required care
- Poverty, racial, and ethnic disparities, which place children at greater risk for poor outcomes

Other concerns inherent to hospitalization of children include medical errors, medication errors, communication errors, falls, injuries, abductions, and poor outcomes directly linked to hospital staffing.

Figure 3-6

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- Anticoagulants
- Electrolytes
- Narcotics

Types of Errors in Pediatric Care

In general, medication errors in pediatrics can be classified into one of four categories:

- Acts of omission
- Acts of commission
- Scheduling misperceptions
- Noncompliance on the part of the family or child

Omissions are errors where a team member did not do or provide something for a child that should have been implemented. Omitting a dose of antibiotic, forgetting to open the clamp on an intravenous electrolyte replacement solution to correct a significant serum depletion, and missing a prescribed application of a topical steroidal anti-inflammatory drug are all errors of omission.

Acts of commission occur when a pediatric team member does something in error to a child that was not supposed to happen. Examples include treating a child for a condition that the child has not been diagnosed with and administering a medication to a child who does not have a standing order for this therapy.

Scheduling misperceptions involve the incorrect timing of a medication or treatment, such as administering a pain medication before it is due or administering an antibiotic to a child recently transferred from the emergency department who just received the medication in the emergency department (i.e., giving the medication too soon after the last dose). Compliance concerns may arise regarding whether the family participated in administering a medication or treatment as it was ordered, or whether the family filled a prescription that was ordered for a child.

According to McDowell, Ferner, and Ferner (2009), medication errors can be thought of as having a "pathophysiology" in that errors can be classified in one of many types: when an *action* that was intended to take place is not performed; when errors take place due to inadequate knowledge known as a *mistake*; when a well-formulated plan is not executed *(slip)* and an *erroneous act* or lapse of the plan occurs; or when *inaccurate calculation* of the required dose occurs. These authors stress that healthcare systems are complex and errors occur at various stages and steps of orders, communication, preparation, and administration.

Impact of Errors in Pediatric Care

Young children are inherently vulnerable, as they do not question or monitor their care. The impact of errors on young children exceeds the effects on adults, with such errors causing more harm and having a more significant impact on pediatric patients' safety. Children need to be protected from errors, and pediatric nurses must adhere to safety protocols to ensure that the risks of errors are reduced. The implementation of electronic order entry and computerized medication administration programs (scanning) has reduced the number of errors, but communication remains the single most important factor in errors involving pediatric patients. Reducing the impact of errors in the pediatric population requires individual dedication, team effort, and institutional commitment.

BEST PRACTICES

Reducing Miscommunications and Errors by Using Handoff Bundles

Handoff bundles have been shown to reduce medical errors in pediatric healthcare settings by reducing miscommunication. In research conducted by Starmer et al. (2014), the use of a standardized communication tool, handoff training, team handoff structure, and a verbal mnemonic reduced errors from 33.8 errors per 100 admissions to 18.3 errors per 100 admissions. Use of the SIGNOUT? mnemonic was recognized as a key factor in the improved rates, along with a "patient summary," "to-do list," and "contingency planning." The SIGNOUT? mnemonic, which was developed by Horwitz, Moin, and Green (2007), includes the following elements:

S = Sick? Do not resuscitate? Unstable?
I = Identifying data, gender, weight, age, and diagnosis
G = General course of hospitalization
N = New events of the day, including vital signs, diagnostics, lab results, and medications
O = Overall health status/clinical condition
U = Upcoming possibilities, with their plan and rationale
T = Tasks to complete, plan, rationale, and time frame
? = Any questions? Concerns?

Communication Tips

Thorough professional communication in the field of pediatrics will reduce the chance of errors. Areas where communication mishaps are prone to happen include handoffs between caregivers (also known as handovers, sign-offs, and shift reports) and handoffs between units or departments, such as between the emergency department and the nursing unit, or between the nursing unit and the radiology department. Handoffs include not only the communication of essential care information, but also the transfer of primary responsibility and authority for the child. Consistently using a formal handoff format that provides structure, critical information, and safety assurance is a best practice for minimizing errors. Conversely, insufficient handoffs may cause safety breaches and failures in safe care.

for each age, and knowing how and to whom the nurse should report a change.

Mnemonics for Safety

Many healthcare professionals promote the use of mental mnemonics to encourage safe practice. **Mnemonics** are memory tools used to rapidly recall complex information, sets of steps for skills, or components of treatment plans. Most mnemonics are intended to help practitioners either recall information or recall steps of behaviors. These tools promote safety in that they allow for ready recall of standards agreed upon in professional practice (Hagerman, Varughese, & Kurth, 2014). CAB is an example; it is used to recall the first three steps of cardiopulmonary resuscitation—compression, airway, breathing. The **Best Practices: Using Mnemonics** feature highlights this kind of memory tool for double-checking use of medications in children.

BEST PRACTICES

"Time-outs" are a sound safety communication technique that must be used prior to any medical procedure, medical diagnostic procedure, or surgical procedure. Before beginning the procedure, the team involved with the child's care should gather together around the child and conduct a safety time-out. All team members should listen for and confirm the accuracy of one team member's review of the child's name, birthday, medical record number, presence of a name band, ordered procedure, correct location for the procedure, consent secured, parent's whereabouts during the procedure and contact cell number, and a review of medications used or anesthetic used for the procedure. The Joint Commission (2005) encourages that a visual reminder of the need for time-outs be placed strategically in the procedural, treatment, or surgical room.

One of the most important aspects of promoting safety for children is rapidly identifying any change in the patient's clinical status, and then rapidly reporting the change to the proper physician for guidance or orders. Children's conditions can change very abruptly; thus, an important skill for nurses is the ability to quickly assess a child and discover a change in clinical status, and then know when and to whom to report this change. Safety in pediatric nursing is based on skills that are tailored toward children, including knowing the expected average vital signs

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BEST PRACTICES

Using Mnemonics

An example of a mnemonic that assists with a child's safety is one used to remember which medications, at a minimum, should be double-checked by two licensed caregivers. (Some institutions will have additional requirements, so the nurse should always check the specific institution's policy.) The mnemonic D'BITCH'EN can be used to remind a caregiver which categories of medications should be doubled-checked with a second nurse:

D = Digoxin or any heart medication
B = Blood products of any kind, including red blood cells, platelets, plasma, intravenous immunoglobulin (IVIG), and clotting factors
I = Insulins and oral hypoglycemics
T = Total parenteral nutrition and lipids
C = Chemotherapeutics and any medication given as part of cancer treatments, including oral prednisone or intravenous steroidal anti-inflammatory drugs
H = Heparin or any anticoagulant
E = Electrolytes given to replace serum values or given as a treatment, such as magnesium for intractable asthma symptoms
N = Narcotics or any pain medication that has the potential to cause altered mental status, respiratory depression, or any other significant symptoms

Case Study

At a home-based toddler care program, a 2-year-old boy was playing in the backyard with 12 other children. Three supervising adults were engaging in play with the other toddlers. The young boy ran along the side of the home, over to some trashcans that had collected water during a recent rainstorm. The child threw a toy into one of the cans, and then scrambled up onto a bush next to the trashcan so he could climb in and retrieve the toy. The child fell into approximately 9 inches of water; he was quickly found but was unconscious.

Emergency medical personnel were called and brought to the scene. The child was resuscitated at the site and brought into the local emergency department, where his heart rate after administration of epinephrine was found to be 50 beats per minute, his respiratory rate was 8 breaths per minute, and his blood pressure was 72/30 mm Hg. The child was admitted into the pediatric intensive care unit (PICU) and quickly placed on a ventilator for respiratory support. The child's admitting diagnosis was hypoxic ischemia encephalopathy, also known as a "near-drowning."

Case Study Questions

1. State the safety breaches found within the home-based toddler care program described in the scenario.
2. What are the immediate needs of the family during the child's emergency room stay and transfer to the PICU?

As the Case Evolves. . .

Following the near-drowning incident in this case study, the facility's owner seeks training for employees to prevent similar incidents from happening again.

3. Which of the following represents an appropriate level of intervention to improve the safety profile of the facility?
   A. A nurse should visit the facility and perform a safety sweep of the facility yard to identify hazards.
   B. Recommend to the facility's owner that all employees be provided with training in first aid and CPR on a regular basis, at least annually.
   C. A nurse should create a binder of educational resources to give to the facility's owner so that employees can be offered safety training when they are first hired.
   D. All of these actions described should be offered to the facility as part of a comprehensive and ongoing training program.

The toddler in this case study is being cared for in the PICU. To the parents' relief, initial indications are that the child was resuscitated quickly enough to avoid severe neurologic injury. However, less than 24 hours after admission, a nurse monitoring the child notices that he has developed a low-grade fever just before she is due to go off shift.

4. Which of the following actions represents an appropriate response to ensure the child's safety in the PICU when the nurse goes off shift?
   A. Note the change and the time of observation on the child's chart and recommend administration of antibiotics.
   B. Verbally communicate that the child has developed a fever to another nurse coming in on the next shift.
   C. Formally hand off the child to the next-shift nurse using both verbal and written forms of communication, including all background information, current status, and concerns raised by the change in status.
   D. Remain for 1 hour after the shift ends to ensure that the child's status does not further deteriorate.

Chapter Summary

- Safety is a critical issue in holistic and comprehensive pediatric nursing care. Young children are inherently unsafe and require more than supervision; that is, they require safe environments in which to play, grow, develop, and thrive.
- Many national organizations have developed safety guidelines for parents of children of all ages, including the American Academy of Pediatrics and the Society of Pediatric Nursing.
- The Quality and Safety Education for Nurses (QSEN) project was created to address challenges encountered when trying to prepare nurses for professional safe practice. This program focuses on the knowledge, skills, and attitudes needed to consistently and continuously improve the practice of professional nursing while providing a foundation of safety.
- Safety as a concept is widely used to trigger a cascade of thinking about identifying harm, reducing errors, and

promoting safety. Thinking conceptually about safety allows the nurse to transfer existing knowledge about this issue to an actual clinical situation.

♦ Injury prevention and safety education for families across developmental stages is a nursing imperative.

♦ Neither infants nor young toddlers can be expected to understand what is "safe" and what is "unsafe." By a child's third birthday, however, children should have some understanding that certain behaviors will put them in harm's way.

♦ Children require responsible adults to provide anticipated safety measures at home, in daycare or school facilities, and on playgrounds, and they require an emerging sense of safety within that manifests as safe decisions as they mature.

♦ Lower household income is associated with a number of safety issues and risk factors that clinicians should understand, assess, and help families to mitigate through available resources.

♦ Pediatric nurses are in a unique position to offer anticipatory guidance to parents and caregivers about safety for children. Safety must be ensured in play, school, and home environments, and nurses should provide education on measures to achieve this goal.

♦ In pediatric clinical settings, thorough professional communication will reduce the risk of errors. Areas that are especially prone to communication mishaps include handoffs between caregivers and handoffs between units or departments.

♦ One of the most important aspects of promoting safety for children is the rapid identification of a change in clinical status, followed by the rapid reporting of the change to the proper physician for guidance or orders.

♦ Many healthcare professionals use mental mnemonics as means to encourage safe practice. Mnemonics allow recall of standards agreed upon in professional practice.

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