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# WONG'S NURSING CARE OF INFANTS AND CHILDREN



EIGHTH EDITION

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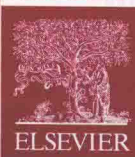
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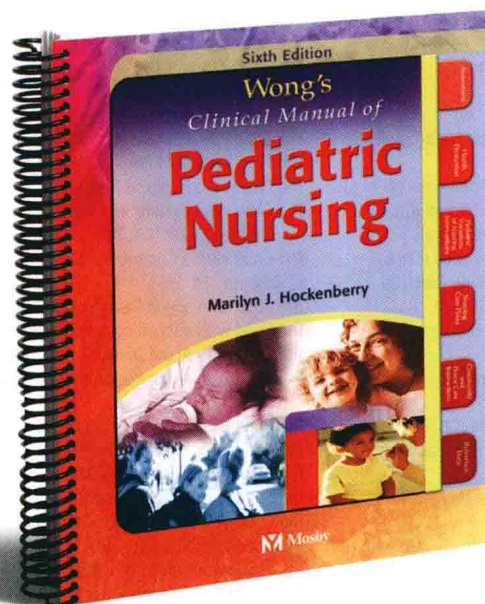
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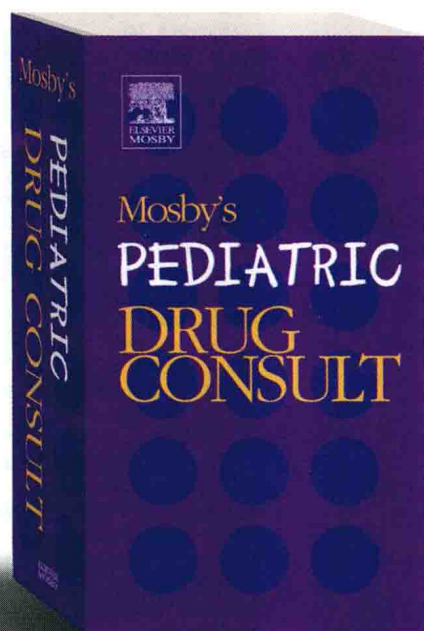
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# Preface

The eighth edition of **Wong's Nursing Care of Infants and Children** is revised to keep pace with new innovations in pediatric nursing care. This text has been a landmark in pediatric nursing since it was first published over two decades ago under the leadership of Donna Wong. This kind of recognition places a unique accountability and responsibility on us to continue to strive to provide students with the latest information they need to become competent, critical thinkers and to attain the sensitivity necessary to become caring pediatric nurses.

To accomplish this, David Wilson has joined Marilyn Hockenberry on this edition as the second editor. Patrick Barrera continues to serve as a contributing editor. This team has put together an expert panel of 60+ nurses and multidisciplinary specialists who assisted in reviewing, revising, rewriting, and authoring portions of the text on areas undergoing rapid and complex change, such as immunizations, genetics, home care, high-risk newborn care, adolescent health issues, and numerous diseases. We have carefully preserved aspects of the book that have met with such universal acceptance—its state-of-the-art evidence-based information; its strong, integrated focus on the family and community; its logical and user-friendly organization; and its easy reading style.

We have tried to meet the increasing demands of faculty and students to teach and to learn in an environment characterized by rapid change, enormous amounts of information, fewer traditional clinical facilities, and less time. To help students quickly locate essential information, most of the features used in the previous edition have been retained. Significant revisions and additions to the Evidence-Based Practice boxes have been made using the PICO approach. Nursing Care Plans received major revisions and now include both NIC and NOC indicators. Nursing Process boxes have been developed and added to each chapter to streamline material, and a dedicated chapter on pain in children has been added to this edition. A Spanish index has been added to the Appendixes to assist students with common word translations. Most important, this text continues to encourage students to *think critically*.

This book is about families with children, and the philosophy of family-centered care is emphasized. This book is also about providing atraumatic care—care that minimizes the psychologic and physical stress that health promotion and illness can inflict. Features such as Family Focus, Family Home Care, Community Focus, and Atraumatic Care boxes bring these philosophies to life throughout the text. Finally, the philosophy of delivering nursing care is addressed. We believe strongly that children and families need consistent caregivers. The establishment of the therapeutic relationship with the child and family is explored as the essential foundation for providing quality nursing care.

This text serves as a reference manual for the practicing nurse. The latest recommendations have been included from authoritative organizations such as the American Academy of Pediatrics, Centers for Disease Control and Prevention, Agency for Healthcare Research and Quality, American Pain Society, American Nurses Association, and National Association of Pediatric Nurse Associates and Practitioners. To expand the universe of available information, websites and e-mail addresses have been included for hundreds of organizations and other educational resources.

## Organization of the Book

The same general approach to the presentation of content has been preserved from previous editions, although much content has been added, condensed, and rearranged within this framework to improve flow, minimize duplication, and emphasize health care trends, such as home and community care. This book is divided into two broad parts. The first part of the book, sometimes called the “age and stage” approach, considers infancy, childhood, and adolescence from a developmental context. It emphasizes the importance of the nurse’s role in health promotion and maintenance and in considering the family as the focus of care. From a developmental perspective, the care of common health problems is presented, giving readers a sense of what normal problems can be expected in otherwise healthy children and demonstrating when during childhood these problems are most likely to occur. The second part of the book presents the more serious health problems not specific to any particular age group but that frequently require hospitalization or major medical and nursing interventions.

**UNIT I (Chapters 1 to 5)** provides an overview of the multitude of influences on a child who is developing as a member of a family unit and maturing within a culture, community, and society. Chapter 1 includes a discussion of morbidity and mortality in infancy and childhood and examines child health care from a historical perspective. Because unintentional injury is one of the leading causes of death in children, an overview of this topic is included. The nursing process, with emphasis on nursing diagnosis and outcomes and the importance of developing critical thinking skills, is presented. In this edition, the critical components of evidence-based practice are added and provide a template for exploring the latest pediatric nursing research or practice guidelines throughout the book.

Chapter 2 provides the opportunity to expand the discussion of social, cultural, and religious influences on child development and health promotion, including socioeconomic factors, customs, and health beliefs and practices. The content clearly describes the role of the nurse, with such additions as guidelines for culturally



sensitive interactions and an updated table discussing religious beliefs that affect nursing care. Chapter 3, devoted to the family, further emphasizes the importance of this social group to the health and welfare of children. Family strengths and vulnerabilities are addressed, and current findings on adoption, divorce, single parenting, stepfamilies, and dual-earner families have been incorporated. The child in the context of family, culture, and community has been broadened to include discussion in Chapter 4 of the issues involved in community health nursing. This chapter provides important information on community-based nursing care, with emphasis on epidemiology as it applies to the detection and identification of causes of morbidity and mortality in pediatrics. Chapter 5 has been completely revised by a leading nurse expert, who focuses on heredity as it relates to health promotion and the influence of the Human Genome Project on future treatment strategies for inherited diseases.

**UNIT II (Chapters 6 and 7)** is concerned with the principles of critical nursing assessment by keeping pace with the newest evaluation strategies in nursing. Chapter 6 contains guidelines for communicating with children, adolescents, and their families; telephone triage; and a detailed description of a health assessment, including an extensive discussion of family assessment and nutritional assessment. This chapter provides a comprehensive approach to physical examination and developmental assessment, using the latest literature on temperature measurement and the latest growth charts on how to assess a child's body mass index (BMI).

A unique feature in this edition is the development of a new chapter devoted to critical assessment and management of pain in children. Although the literature on pain assessment and management in children has grown considerably, this knowledge has not been widely applied in practice. Chapter 7 has been added to address this concern by presenting detailed pain assessment and management strategies, including discussion of common pain states in children.

**UNIT III (Chapters 8 to 11)** stresses the importance of the neonatal period, the time of greatest risk to a child's survival, and discusses several health concerns encountered in the vulnerable first month of life. Chapter 8 has been updated and revised to include the newest intrauterine growth charts as well as the latest information on the benefits of breast-feeding. Infant formula tables have been revised and simplified, and the sections on infant abduction, newborn circumcision, and circumcision analgesia have all been revised and updated. Newborn screening guidelines have been updated and include universal hearing screening and administration of hepatitis B vaccine. The latest information on preparation for newborn home discharge, newborn skin care and bathing, and umbilical cord care has been added. Chapter 9 has been revised and updated in the areas of birth trauma, newborn dermatologic problems, and hyperbilirubinemia, including the latest guidelines for the management of hyperbilirubinemia in near-term and term newborns. Updated management protocols and screening guidelines are included for neonatal hypoglycemia and inborn errors of metabolism such as galactosemia and phenylketonuria. Atraumatic care of the newborn remains an important concept in these chapters. Evidence-based practice and critical thinking exercises have been updated as well. Chapter 10 includes an updated section on neurodevelopmental care of the preterm infant. Updated and revised are the sections on care of the preterm

infant, including sepsis, discharge planning, retinopathy of prematurity, neonatal skin care guidelines, and bronchopulmonary dysplasia/chronic lung disease. The most recent classifications of intraventricular/germinal matrix hemorrhage and neonatal seizures are presented in this chapter. This chapter also now contains information regarding maternal conditions that may adversely affect the fetus and newborn, including maternal viruses, fetal alcohol exposure, and neonatal drug exposure. Chapter 11 has been extensively revised, including new color photos, and discusses anorectal malformations, management of the child with spina bifida, cranial deformities including plagiocephaly, developmental dysplasia of the hip, cleft lip and cleft palate, biliary atresia, abdominal wall defects, congenital diaphragmatic hernia, and management of genitourinary tract defects. The gender assignment section has been revised according to the latest guidelines and recommendations.

**UNITS IV through VII (Chapters 12 to 21)** present the major developmental stages in childhood, expanded to provide a broader concept of the stages and the health problems most often associated with each age group. Special emphasis is placed on the preventive aspects of care. The health promotion chapters follow a standard approach that is used consistently for each age group.

The chapters on health problems primarily reflect more typical and age-related concerns. The information on many disorders has been revised to reflect recent changes. Examples include the latest information on communicable diseases, childhood immunizations, food allergies, colic, failure to thrive, child passenger safety, pacifier use, thumb sucking, lead poisoning, wound healing, sexual abuse, Lyme disease, attention deficit hyperactivity disorder, school-related violence, tobacco use, contraception, teenage pregnancy, substance abuse, adolescent suicide, and eating disorders such as obesity. The latest Dietary Reference Intake (DRI) guidelines, American Heart Association dietary guidelines for children, and updated USDA dietary guidelines for children (MyPyramid), aimed at decreasing obesity and cardiovascular disease, are presented. The section on sudden infant death syndrome (SIDS) has been extensively updated to include the latest American Academy of Pediatrics considerations for cosleeping, pacifier use, and plagiocephaly.

The chapters on adolescence include the latest American Medical Association (AMA) guidelines for adolescent prevention services (GAPS), rankings of body mass index percentiles, strategies to decrease tobacco use, and current trends in suicide. All psychosocial/physiologic conditions discussed include the latest diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)*. The section on gay, lesbian, and bisexual adolescents has been revised and updated in Chapter 19.

**UNIT VIII (Chapters 22 to 25)** deals with children who have the same developmental needs as growing children but who, because of congenital or acquired physical, cognitive, or sensory impairment, require alternative interventions to facilitate development. Chapter 22 reflects the latest trends in the care of families and children with chronic illness or disability, such as home care, normalizing children's lives, focusing on developmental needs, enabling and empowering families, and providing early intervention. Extensive revisions have been made in Chapter 23 to reflect increased awareness of the need for quality nursing care at the end of life. This chapter highlights common fears experienced by the

child and family and includes discussion of the nurse's reaction to caring for dying children. The content in Chapter 24 on cognitive, sensory, and communication impairment includes the latest information on mental retardation and learning disorders. Chapter 25 has been revised to reflect the latest trends in family-centered home care of children with chronic health conditions. Updated information includes guidelines for choosing a home health care agency, home care coordination, and parent-professional collaboration in the home.

**UNIT IX (Chapters 26 and 27)** is concerned with the impact of hospitalization on the child and the family and presents a comprehensive overview of the stressors imposed by hospitalization and nursing interventions available to prevent or eliminate these stressors. Chapter 26 discusses the care of the hospitalized child and family with consideration for increasing care in ambulatory centers. Chapter 27 discusses safe implementation of procedures in children, including emphasis on the use of therapeutic hugging. This chapter also includes numerous new Evidence-Based Practice boxes designed to provide rationales for the interventions discussed in the chapter. A new focus in this chapter is the evidence related to preparation of the child for procedures commonly performed by nurses. Recommendations for practice are based on the evidence and concisely presented in Evidence-Based Practice boxes throughout the chapter.

**UNITS X through XIV (Chapters 28 to 40)** consider serious health problems of infants and children primarily from a biologic system orientation, which has the practical organizational value of permitting health care problems and nursing considerations to relate to specific pathophysiologic disturbances. Important additions and revisions include discussion of hepatitis, all blood disorders, severe acute respiratory syndrome (SARS), avian flu, acute respiratory distress syndrome (ARDS), respiratory syncytial virus (RSV), tuberculosis, the new classification for asthma, effects of tobacco exposure, seizures, chemotherapy, AIDS, diabetes mellitus, and burns. New guidelines for infant and child resuscitation, including automated external defibrillation, have been updated and added. Chapter 39 has updated sections on considerations for the female athlete as well as injury prevention and management of various sports injuries. Care and management of the child with a fracture has been updated, as have the sections on immobility, mobilization devices, cast care, and orthotics. Conditions such as systemic lupus erythematosus and arthritis have been revised and updated. Chapter 40 includes updates on Guillain-Barré syndrome, cerebral palsy, muscular dystrophy, botulism, and spinal muscular atrophy. New management therapies are presented in the section on spinal cord injuries and rehabilitation, and new drug therapy is discussed for myasthenia gravis.

Extensive **Appendixes** are also included and contain information on family assessment; developmental assessment; growth measurements, including a complete set of the National Center for Health Statistics growth charts; pediatric laboratory values; NANDA-approved nursing diagnoses; and several foreign-language translations of the Wong-Baker FACES Pain Rating Scale. A new addition to the appendixes is a list of Spanish-English Translations to help nurses communicate with Spanish-speaking patients and families. All of the appendixes reflect the most current versions of forms, charts, and measurements.

## Unifying Principles

Several unifying principles have guided the organizational structure of this book since its inception. These principles continue to strengthen the book with each revision in order to maintain a consistent approach throughout each chapter.

### The Family as the Unit of Care

The child is an essential member of the family unit. Nursing care is most effective when it is delivered with the belief that *the family is the patient*. This belief permeates the book. The family is seen as a myriad of structures; each has the potential to provide a caring, supportive environment in which the child can grow, mature, and maximize his or her human potential. In addition to family-centered care being integrated into every chapter, an entire chapter is devoted to understanding the family as the core focus in children's lives. Another chapter discusses the social, cultural, and religious influences that impact family beliefs. Separate sections in yet another chapter deal in depth with family communication and family assessment. The impact of illness, hospitalization, home care, and the death of a child are covered extensively in three additional chapters. The needs of the family are emphasized throughout the text under Nursing Considerations, with a separate section on family support. Numerous Family Focus and Family Home Care boxes are included to assist nurses in understanding and providing helpful information to families.

### An Integrated Approach to Development

Children are not small adults but are special individuals with unique minds, bodies, and needs. No book on pediatric nursing is complete without extensive coverage of communication, nutrition, play, safety, dental care, sexuality, sleep, self-esteem, and of course, parenting. Nurses promote the healthy expression of development and need to understand how this is observed in children at different ages and stages. Effective parenting depends on the parents' knowledge of development, and it is often the nurse's responsibility to provide parents with a developmental awareness of their children's needs. For these reasons, coverage of the many dimensions of childhood are integrated within each developmental-stage chapter, rather than being presented in a separate chapter. Safety concerns, for instance, are very different for a toddler than for an adolescent. Sleep needs change with age, as do nutritional needs. As a result, the units on each stage of childhood contain complete information on all these subjects as they relate to the specific age. Using the integrated approach, students gain an appreciation for the unique characteristics and needs of children at every age and stage of development.

### Focus on Wellness and Illness: Child, Family, and Community

In a pediatric nursing text, a focus on illness is expected. Children become ill, and nurses typically are involved in helping children get well. However, it is not sufficient to prepare students to care

primarily for sick children. First, health is more than the absence of disease. Being healthy is being whole in mind, body, and spirit. Therefore the majority of the first half of the book is devoted to discussions that promote physical, psychosocial, mental, and spiritual wellness. Much emphasis is placed on anticipatory guidance of parents to prevent injury or illness in the child. Second, more than ever, health care is prevention focused. The objectives set forth in *Healthy People 2010* clearly establish a health care agenda in which solutions to medical/social problems lie in preventive strategies. Competent nursing care flows from this knowledge and is enhanced by an awareness of childhood development, family dynamics, and communication skills.

## Nursing Care

Although this text incorporates information from numerous disciplines (medicine, pathophysiology, pharmacology, nutrition, psychology, sociology), its primary purpose is to provide information on the nursing care of children and families. Discussions of all disorders conclude with a section on Nursing Care Management. To strengthen recognition of nursing care principles, nursing process boxes have been added to this edition. These boxes present specific assessment, diagnosis (problem identification), planning, implementing, and evaluation strategies specific for each disease throughout the book. In addition, all of the nursing care plans have been completely revised. Taken together, they provide coverage of nursing care for numerous diseases, disorders, conditions, and crises of childhood.

The purpose of the newly revised care plans, like every other feature of the book, is to teach and convey information. They include all current nursing diagnoses approved by NANDA, which have a potential bearing on health problems. Although the care plans can be individualized for use with a specific patient in a clinical setting, this is not their main purpose. For every diagnosis, expected patient outcomes and extensive possible nursing interventions with rationales are included. The revised care plans include subjective and objective data for the defining characteristics of each nursing diagnosis. NIC and NOC concepts for nursing interventions and expected outcomes have been added.

## Critical Role of Research and Evidence-Based Practice

This eighth edition is the product of an extensive review of the literature published since the book was last revised. So that information is accurate and current, the majority of citations are less than 5 years old, and almost every chapter has entries within 1 year of publication. Examples of current cutting-edge information include recommendations from the American Academy of Pediatrics on immunizations and sleep position. The chapter on pain reflects the latest guidelines from the Agency for Healthcare Research and Quality (AHRQ), formerly known as the Agency for Health Care Policy and Research (AHCPR), and the American Pain Society. The discussions on skin care reflect the AHRQ's guidelines on pressure ulcers. The American Diabetes Association's classification of diabetes mellitus is included, as are the most recent treatment guidelines for asthma.

## Canadian Content

The eighth edition of this text includes Canadian immunization schedules in Chapter 12. Throughout the text, Canadian resource organizations are also provided. These efforts have been made to make the text as valuable as possible to Canadian readers.

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Just as children and their families bring with them a value system and unique background that affect their role within the health care system, so it is that each nurse brings to each child and family an individual set of characteristics and values that will affect their relationship. Although we have attempted to present a total picture of the child in each age-group, both in wellness and in illness, no one child, family, or nurse will be found in this book. We hope that each page, chapter, and unit builds a foundation on which the nurse can begin to construct an ideal of comprehensive, atraumatic, and individualized nursing care for infants, children, adolescents, and their families.



Much effort has been directed toward making this book easy to teach from and, more important, easy to learn from. In this edition the following features have been included to benefit educators, students, and practitioners.

- A functional and attractive **FULL-COLOR DESIGN** visually enhances the organization of each chapter as well as the special features.
- Numerous **COLOR PHOTOGRAPHS** have been added to this edition to reflect the latest in nursing care. Anatomic drawings are easy to follow, with color appropriately used to illustrate important aspects, such as saturated and desaturated blood. As an example, the full-color heart illustrations in Chapter 34 clearly depict congenital cardiac defects and associated hemodynamic changes.



**FAMILY HOME CARE** boxes help nurses and students teach parents about the special needs of their infants and children.



**EVIDENCE-BASED PRACTICE** boxes have been completely revised in this edition to focus the reader's attention on application of both research and critical thought processes to support and guide the outcomes of nursing care and to provide measurable outcomes that nurses can use to validate their unique role in the health care system.



**COMMUNITY FOCUS** boxes address issues that expand to the community, such as increasing immunization rates, preventing lead poisoning, or decreasing smoking among teens.



**CRITICAL THINKING EXERCISES** have been revised in this edition to describe brief scenarios of the child-family-nurse interaction that depict real-life clinical situations. From the synthesis of the topical content and a critical analysis of possible options, the reader chooses the best intervention and learns to make clinical judgments. A rationale is offered for the correct answer, and explanations are given for the incorrect options at the end of the chapter.



**CULTURAL AWARENESS** boxes integrate concepts of culturally sensitive care throughout the text. Their emphasis is on the clinical application of the information, whether it focuses on toilet training or on male or female circumcision.



**ATRAUMATIC CARE** boxes emphasize the importance of providing competent care without creating undue physical and psychologic distress. Although many of the boxes provide suggestions for managing pain, atraumatic care also considers approaches to promoting self-esteem and preventing embarrassment.



**ETHICS CASE STUDIES** have been added to reflect the complex patient care situations nurses face in clinical practice and to illustrate proper considerations in care delivery.

**NursingCarePlans** include nursing diagnoses, defining characteristics of the diagnoses, expected patient outcomes, and rationales for the included nursing interventions that may not be immediately evident to the student. The care plans now include NIC and NOC concepts. All care plans include patient and family goals and the most recent NANDA nursing diagnoses.

**NursingProcess** boxes present information on the assessment, diagnosis, planning, implementation, and evaluation of the specific disease or diseases presented in the chapter.

Numerous pedagogic devices that enhance student learning have been retained from previous editions:

- **CHAPTER OUTLINES** with page numbers begin each chapter, which allows readers to quickly locate topics of interest.
- **RELATED TOPICS AND ELECTRONIC RESOURCES** at the beginning of each chapter indicate the chapter or chapters where additional discussion of a given topic can be found. On turning to the cross-referenced chapters, readers will find the topic listed in the chapter outline with a page number. Additional exercises and activities included on the Companion CD or Evolve website are listed here to provide further reinforcement to the student.

**NursingAlerts!** call the reader's attention to considerations that if ignored could lead to a deteriorating or emergency situation. Key assessment data, risk factors, and danger signs are among the kinds of information included.

**NursingTips** present handy information of a nonemergency nature that makes patients more comfortable and the nurse's job a little easier.



**GUIDELINES** boxes summarize important nursing interventions for a variety of situations and conditions.



**EMERGENCY TREATMENT** boxes are flagged by colored thumb tabs, enabling the reader to quickly locate interventions for crisis situations.



**FAMILY FOCUS** boxes present issues of special significance to families who have a child with a particular disorder. This feature is another method of highlighting the needs or concerns of families that should be addressed when family-centered care is provided.

- **KEY TERMS** are highlighted throughout each chapter to reinforce student learning.
- Hundreds of **TABLES** and **BOXES** highlight key concepts and nursing interventions.
- **KEY POINTS**, located at the end of each chapter, help the reader summarize major points, make connections, and synthesize information.
- **APPENDIXES** provide additional materials to assist with assessment, including family, developmental, growth, and laboratory evaluation. The NANDA-approved nursing diagnoses and translations of the Wong-Baker FACES Pain Rating Scale also are found here, as well as new Spanish-English translations to help in communication with children and their families.
- An **INDEX**, detailed and cross-referenced, allows readers to quickly access discussions.
- **PRINTED ENDPAPERS** on the inside back cover provide information nurses refer to often, such as vital signs and blood pressure measurements.

# Acknowledgments

This new eighth edition of *Wong's Nursing Care of Infants and Children* brings with it the addition of a new era of authors for the book. To continue the Wong legacy of excellence in nursing education, we have joined together numerous authors with diverse expert nursing backgrounds to continue the commitment to providing the latest state-of-the-art information on pediatric nursing practice. We are grateful to the many nursing faculty members, practitioners, and students who have offered their comments, recommendations, and suggestions. We are grateful to the many reviewers who brought constructive criticism, suggestions, and clinical expertise to this edition. We could not have completed this enormous task of updating and adding information without the dedication of these special people.

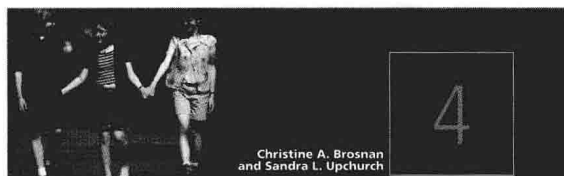
We are especially thankful to **Patrick Barrera**, Contributing Editor, for this book. His commitment to excellence has provided attention to detail that is essential to maintaining the text's uniqueness and quality. His extensive efforts at searching the literature

have provided the book with the most up-to-date information available to pediatric nursing practice. We are also appreciative of **Dr. Eufemia Jacob's** outstanding photography, which is found throughout the new edition. We would like to thank the Health Sciences Library staff at Saint Francis Hospital, Tulsa, for their assistance in obtaining material—**Beth Treaster, Cheryl Stanford,** and **Veronica Stewart**.

No book is ever a reality without the dedication and perseverance of the editorial staff. Although it is impossible to list every individual at Elsevier who has made exceptional efforts to produce this text, we are especially grateful to **Shelly Hayden**, whose commitment to pediatric nursing education over the years is reflective of an outstanding publisher. We appreciate her exceptional leadership skills and devotion to her authors. Special thanks also to **Sally Schrefer, Catherine Jackson, Heather Bays, Deon Lee, Amy Buxton,** and **Andrew Eilers** for their support and commitment to excellence.

**Marilyn J. Hockenberry**  
**David Wilson**

# Special Features



Christine A. Brosnan  
and Sandra L. Upchurch

## Community-Based Nursing Care of the Child and Family

### CHAPTER OUTLINE

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Community, 92  
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Epidemiology, 94  
Distribution of Disease, Injury, or Illness, 95

Epidemiology: Triangle, 95  
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### RELATED TOPICS AND ELECTRONIC RESOURCES

**In Text**  
Healthy People 2010: Perspectives of Pediatric Nursing, Ch. 1  
Measuring the Distribution of Disease, Injury, or Illness: Perspectives of Pediatric Nursing, Ch. 1

Screening Physical and Developmental Assessment of the Child, Ch. 6  
Community CD  
Critical Thinking Exercise—Growth Trends During Infancy  
NCELEX Review Questions

### Community Health Concepts

#### Community

Healthy communities provide children not only with high-quality medical care, but also with a nurturing, safe place to live and grow. Healthy communities address concerns through collaboration between and among citizens, businesses, and governmental and private agencies. They address the concerns using problem-solving strategies within the confines of the community's value system, thus increasing the community's own capacity to meet its needs (Hyman and Iovann, 2004). The health of children and their families is greatly influenced by their community, and nurses can make a significant contribution by working with the community to promote children's health. Nurses working with pediatric populations need to understand the concepts and processes critical to addressing pediatric concerns from a community health perspective.

This chapter focuses on community health nursing as it relates to children. First, it outlines and defines the concepts that serve

as the basis of the community health nursing process. Next, it describes the process step by step. It concludes by using the process to address a very real child health concern: childhood obesity.

#### Nursing Tip

Knowing the characteristics of a healthy community will help the nurse develop a care plan. A healthy community shapes its own future by embracing diversity and connecting to people and resources. Members of organizations in healthy communities are being asked to show their impact. That is, the actual costs and benefits of their work (Association for Community Health Improvement, 2003; International Health Cities Foundation, 2002).

A community can be defined as a group of individuals with shared characteristics or interests who relate to each other (Alexander and Blum, 2002).

### 606 Chapter 16 Health Problems of Early Childhood

#### Reducing Blood Lead Levels\*

- Make certain child does not have access to peeling paint or chipped surfaces painted with lead-based paint, especially window sills and wells.
- If a house was built before 1960 (possibly before 1980) and has hard-surface floors, wet mop them at least once a week. When other hard surfaces (e.g., window sills, baseboards) or loose paint chips are in an area, such as a window well, use a wet disposable cloth to pick up and discard them. Do not vacuum hard-surface floors or window sills or wells, since this spreads dust. Use vacuum cleaners with HEPA filters to remove dust from rugs rather than vacuum cleaners with suction only. If a rug is known to contain lead dust and cannot be washed, it should be discarded.
- Wash and dry child's hands and feet frequently, especially before eating.
- Wash toys and pacifiers frequently.
- If soil around home is or is likely to be contaminated with lead (e.g., if home was built before 1960 or is near a major highway, just prior or after ground care, plant trees around outside of house so that child cannot play there).
- During remodeling of older home, be certain to follow correct procedures. For certain children and pregnant women are not in the home, day or night, until process is completed. After demolishing, thoroughly clean house using HEPA vacuum, to damp mop and dust before reoccupancy.
- In areas where lead content of water exceeds the drinking water standard and a particular faucet has not been used for 6 hours or more, "flush" the cold-water pipes by running the water until it becomes cold at 4 and 10 psi (30 seconds for more than 2 inches). The new time water has been sitting in pipes, the more lead it may contain.

Chelating agents are administered deeply into a large muscle mass. (See Atraumatic Care box.) To lessen the pain from EDTA, the local anesthetic procaine is injected with the drug. Rotation of sites is essential to prevent the formation of painful areas of fibrosis. Because EDTA and lead are toxic to the kidneys, records are kept of intake and output, and the results of urinalysis are assessed to monitor renal functioning. Because of the risk of seizures, appropriate precautions are instituted at the bedside of children with high BLLs.

#### Nursing

EDTA is never given in the absence of an adequate urinary output. Children receiving the drug intramuscularly must be able to maintain adequate renal output of urine.

Discharge planning for children with lead poisoning must include thorough education of families regarding safety from lead hazards, their actions from ongoing medication administration and needed follow-up care, and confirmation that the child will be discharged to a home without lead hazards. Although caution must

#### Atraumatic Care

To lessen the pain from intramuscular injection of calcium disodium edetate (EDTA), the local anesthetic procaine is injected with the drug. Apply intracutaneous (ID) to the skin over the puncture site 2 to 3 inches before the injection of EDTA and intradermal (ID). Use intravenous (IV) whenever possible.

#### Lead Chelation Therapy

To lessen the pain from intramuscular injection of calcium disodium edetate (EDTA), the local anesthetic procaine is injected with the drug. Apply intracutaneous (ID) to the skin over the puncture site 2 to 3 inches before the injection of EDTA and intradermal (ID). Use intravenous (IV) whenever possible.

## Chapter Openers

Chapter opening pages contain *Outlines and Related Topics* for easy location of topics within the text and *Electronic Resources* listing the associated activities on the Companion CD and Evolve website for students.

### 172 Chapter 6 Communication and Physical and Developmental Assessment of the Child

#### Temperature Measurement in Pediatrics

**Question**  
In infants and children, what is the most accurate method for measuring temperature?

**Background**  
Temperature measurement is a common assessment parameter. However, interpretation of the temperature finding, because of the variability obtained by various temperature measurement modalities, is often controversial.

**Objective**  
To evaluate the evidence comparing various temperature measurement modes in infants and children.

#### Search Strategy

Selected literature to obtain clinical research studies related to this case. Selection criteria included English, publications within past 10 years, research-based articles (level 1 or lower), infant and child populations, comparisons to Gold Standard, and child therapeutics.

**Database Used**  
PubMed, Cochrane Collaboration, Med Consult, Joanna Briggs, National Guideline Clearinghouse (AHRQ), TRIP Database Plus, ProQuest, ProQuest.

#### Critical Analysis of the Evidence

**Rectal temperature**—Measurement remains the clinical gold standard for the precise diagnosis of fever in infants and children (Hobdell and Lynch, 2004; University of Michigan, 2003). However, this requires a more invasive procedure and is contraindicated for infants less than 1 month old, children with recent rectal surgery, children with diarrhea or anal fissures, and children receiving chemotherapy (Lancet Healthcare usually affords its success and success). Many parents are uncomfortable with this method, and children may resist it. The capacity to change rectal temperature is small.

**Oral temperature**—Indicates rapid change in core body temperature, but accuracy may be an issue when compared with rectal site (Jensen, Jensen, and others, 2003). Best noninvasive indicator of body temperature when age is appropriate.

**Axillary temperature**—Is convenient and noninvasive in infants and children over 1 month old (Jensen, Jensen, and others, 2003). Despite its low sensitivity and specificity in detecting fever, the axillary site is recommended by the American Academy of Pediatrics (AAP, 2003) as a screening tool for fever in infants 1 month of age and younger.

**Ear (tympanic) temperature**—A precise measurement of body temperature. Meta-analysis of 101 studies comparing tympanic membrane temperatures with rectal temperatures in children concluded that the tympanic method demonstrated a wide range of variability, varying its application in a pediatric setting (Chao, Lancaster, Taylor, and others, 2002). Diagnosis of fever without a focus should not be made based on tympanic thermometry, since it is not an accurate measure of core temperature (Chao, Lancaster, Taylor, and others, 2002; Roddell and Epstein, 2002).

**Temporal temperature**—Temporal artery thermometer was not available for fever in children under 3 months old (Jensen, Jensen, and others, 2003). Temporal thermometry for detecting fever less than 38.2°C (100.8°F) in children 3 to 24 months old (Chao, Lancaster, Taylor, and others, 2002). Temporal thermometry was more effective in determining rapid temperature changes in these children than axillary thermometry (Jensen, and others, 2004). Temporal thermometry can be used as a rapid screening screening tool to identify rectal fever over 39°C (102.2°F) in children 3 to 24 months old, but is unreliable as a screening tool for fever in children 1 month of age and younger.

#### APPLY THE EVIDENCE: NURSING IMPLICATIONS

When providing antipyretic treatment of one body temperature. Studies show that the axillary and tympanic site methods are compared with more accurate core temperature methods. The difference is more evident when an accurate method for obtaining a correct estimate of core temperature is needed. The rectal and ear and oral route in older children. For infants less than 1 month of age, the AAP recommends axillary

temperature for fever (Jensen, 2002). Retrieved April 2003 from <http://www.aap.org/americanacademyofpediatrics/040402>.

For the tympanic artery and rectal thermometry in children in the emergency department, rectal using Core (2011) 11, 181.

For the axillary temperature measurement: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the ear and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

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For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

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For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

For the axillary and rectal temperature: *Arch Pediatr Adolesc Med* 2002;156:1173, 2002.

## Evidence-Based Practice

*Evidence-Based Practice* boxes focus on clinical applications of research and critical thought processes that support and guide the outcomes of nursing care.

## Nursing Alerts

*Nursing Alerts* highlight critical information throughout the text that should not be overlooked when treating patients.