

Special Needs of Pediatric Patients



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Special Needs of Pediatric Patients

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Pediatric patients have their own variety of special technical, clinical, and communication needs when in the radiology department. Children may experience fear and anxiety associated with their illnesses or injuries and require special attention to feel comfortable in an unfamiliar setting. Radiologic technologists who can address young patients warmly and efficiently help ensure successful pediatric procedures. This Directed Reading provides information on the childhood physical, motor, cognitive, language and social developments to improve efficiency and safety for your pediatric patients.

After completing this article, the reader should be able to:

- Identify physical and motor developmental milestones of the pediatric patient.
- Understand the cognitive, language, and social development of pediatric patients.
- Analyze children's understanding of illness and medical procedures and identify appropriate responses.
- Evaluate the radiologic technologist's role in communicating with pediatric patients and their parents.
- Identify actions to improve efficiency and safety of pediatric radiologic procedures.
- Discuss the importance of standards in pediatric patient encounters.

Introduction

Pediatric patients bring a variety of special technical, clinical and communication needs to the radiology encounter. The clinical interpretation of pediatric examinations has become a major area of study in medical textbooks and literature.

Understanding the needs of pediatric patients and their parents begins with a study of children's physical, social, and intellectual development. Learning how children perceive illness and react to examinations at different ages can help the radiologic technologist better understand their behavior and make procedures more positive and successful.

In the 18th century, the concept of child health care hardly existed. Sick children were treated as adults, and treatment often involved purging body and soul to rid them of evil spirits causing the disease.¹ The first pediatric hospital, the Dispensary for Sick Children, was built in London in 1769, primarily to serve

orphaned and abandoned children. This facility closed within 12 years because of lack of financial support. The first medical facility dedicated to pediatrics in the United States was the Children's Hospital of Philadelphia, which was established in 1855. Pediatric radiology services in the United States began in 1899 at Children's Hospital, Boston (see Figure 1).^{1,2}

The first book dealing specifically with pediatric radiology was written in 1910,³ and the Society for Pediatric Radiology was founded in 1958.² John Caffey, MD, was an internal medicine specialist who pioneered the advancement of pediatric radiology, even though he considered it a branch of pediatrics rather than radiology. In addition to his textbooks and other contributions, he expanded the understanding of child abuse, which largely had been ignored to that point.

Between 1970 and 1995, advances in the technical quality of images and the introduction of rare earth filmscreen combinations contributed to lower exposures.

Along with these improvements came increasing use of radiologic examinations for ill children.³ The explosion of new technologies such as ultrasound, computed tomography (CT), magnetic resonance (MR) and digital radiography have expanded the specialty now referred to as pediatric imaging. In 1995 the American Board of Radiology gave the first examinations for the Certificate of Added Qualification in Pediatric Radiology.²

Today all diagnostic imaging examinations can be performed on children as well as adults. However, skills for dealing with pediatric patients have not traditionally been given much emphasis in radiology professional training.⁵ Understanding the pediatric patient's needs, abilities, and limitations can produce the following benefits:⁴

- A higher quality examination.
- Timely completion of the procedure.
- Reduced stress on the radiologist and staff.
- A relieved patient and grateful parents.
- A sense of mastery and accomplishment for the child.

Physicians and psychologists study human development to understand and categorize certain periods of biological, emotional, motor, social, and behavioral changes. These processes overlap, and although stages throughout childhood are based on certain norms, each person develops as an individual. Individual development is the sum of many elements, both genetic and experiential.^{6,7}

Biological Development

Biological development includes processes and changes in each individual's physical makeup.^{6,7} The study of biological development in children contributes not only to awareness of physical size, organ maturation, and physical abilities, but also to an understanding of overall maturation. In fact, 1 model of maturational development theorizes that behavior depends on neurologic maturation and presents the child in the context of a developing neuropsychologic organism.⁸

Neonates

The neonatal period is defined as birth to 1 month of age. The average neonate weighs between 6 and 8½ pounds with an average length of 20 to 21 inches.⁹ At birth the biggest developmental task for the neonate

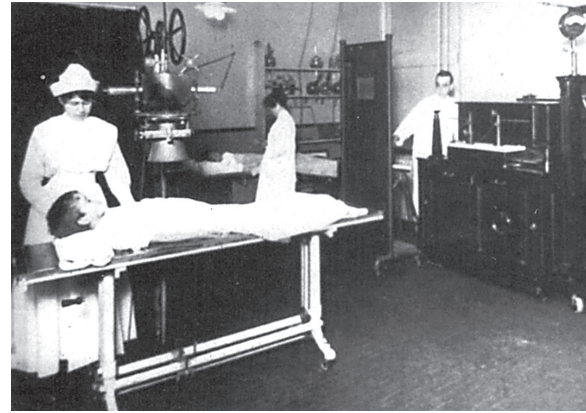


Figure 1. Radiographic room in 1929 in the Hospital for Sick Children, Toronto, Ontario, Canada. There is a collimator attached to the x-ray tube, but the tube housing is still primitive. Extra tubes are on the shelves in the corner. There is a shield, on wheels, with room behind it for 1 or 2 persons but not for the child waiting near the space tubes. Used with permission from Griscom NT. History of pediatric radiology in the United States and Canada: images and trends. Radiographics. 1995;15:1407. Original artwork used courtesy of Derek C. Harwood-Nash, MD, Hospital for Sick Children, Toronto, Ontario.

is adapting to the new world outside the womb. This adaptation involves dramatic physical growth and development. The newborn infant has different proportions than adults or older children. An infant's midpoint rests near the umbilicus, rather than the pubic bone area, as in adults. Newborn posture is flexible and bent. Head circumference adds to the difference in proportion, with the average neonate's head circumference measuring 13½ inches.¹⁰ An infant's immature neck muscles require the head to be supported to avoid damage to fragile blood vessels leading to the brain.⁹

Ossification of bones takes place primarily after birth and at a very rapid rate. However, the bones of the cranium and face, as well as the shaft centers of long bones, are ossified during fetal development. Spaces are present between the bones of the head at birth to allow molding or overlapping of these bones during labor and delivery. Commonly referred to as soft spots, fontanels and sutures are located throughout the skull. The 2 largest are at the top front and top back of the skull. These spots are covered by a tough membrane,