

2009

**EDITORIAL REVISION – 2014
VERSION 1.2**

This document applies to those who begin training on or after July 1st, 2009.

DEFINITION

Pediatric Radiology is a branch of medical practice concerned with the use of imaging techniques in the study, diagnosis, and treatment of disease affecting the infant, child, and adolescent.

GOALS

Upon completion of training, a resident is expected to be a competent subspecialist in Pediatric Radiology capable of assuming a consultant's role in the subspecialty. The resident must acquire a working knowledge of the theoretical basis of the subspecialty, including its foundations in the basic medical sciences and research.

Only candidates certified by the Royal College of Physicians and Surgeons of Canada in Diagnostic Radiology may be eligible for certification in Pediatric Radiology.

Residents must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centred care and service to a diverse population. In all aspects of specialist practice, the graduate must be able to address ethical issues and issues of gender, sexual orientation, age, culture, and ethnicity in a professional manner.

PEDIATRIC RADIOLOGY COMPETENCIES

At the completion of training, the resident will have acquired the following competencies and will function effectively as a:

Medical Expert

Definition:

As Medical Experts, Pediatric Radiologists integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centred care. Medical Expert is the central physician Role in the CanMEDS framework.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Function effectively as consultants, integrating all of the CanMEDS Roles to provide optimal, ethical, and patient-centred medical care

- 1.1. Perform a consultation, including the presentation of well-documented assessments and recommendations in written and/or oral form, in response to a request from another health care professional
- 1.2. Demonstrate use of all CanMEDS competencies relevant to Pediatric Radiology
- 1.3. Identify and appropriately respond to relevant ethical issues arising in patient care
- 1.4. Demonstrate the ability to prioritize professional duties when faced with multiple patients and problems
- 1.5. Demonstrate compassionate and patient-centred care
- 1.6. Recognize and respond to the ethical dimensions in medical decision-making
- 1.7. Demonstrate medical expertise in situations other than patient care, such as providing expert legal testimony or advising governments, as needed

2. Establish and maintain clinical knowledge, skills, and attitudes appropriate to Pediatric Radiology

- 2.1. Apply knowledge of the clinical, socio-behavioural, and fundamental biomedical sciences relevant to Pediatric Radiology, including but not limited to:
 - 2.1.1. Anatomy of the gastrointestinal, genitourinary, respiratory, cardiovascular, musculoskeletal, and neurological systems in the pediatric population, with emphasis on radiological applications
 - 2.1.2. Radiopathological correlation and appropriate imaging applications for the investigation of diseases of the:
 - 2.1.2.1. Gastrointestinal systems
 - 2.1.2.2. Genitourinary systems
 - 2.1.2.3. Respiratory systems
 - 2.1.2.4. Cardiovascular systems
 - 2.1.2.5. Musculoskeletal systems
 - 2.1.2.6. Neurological systems
 - 2.1.3. Technical and physical principles of imaging modalities related to Pediatric Radiology, the inherent limitations of these modalities, and factors affecting quality of the images
 - 2.1.3.1. Plain film radiology
 - 2.1.3.2. Fluoroscopy
 - 2.1.3.3. Ultrasound (US)
 - 2.1.3.4. Nuclear medicine

- 2.1.3.5. Computed tomography: conventional and positron emission tomography (PET)
- 2.1.3.6. Magnetic resonance imaging (MRI), including MR spectroscopy and other evolving techniques, as needed
- 2.1.3.7. Interventional and cardiovascular studies

- 2.1.4. General principles, indications, and potential contributions of fetal MRI
- 2.1.5. Indications, techniques, complications and potential contribution to clinical outcome of pediatric radiology examinations and interventional procedures in the appropriate situations
- 2.1.6. Factors affecting patient care and well-being, safety, and protection with respect to the various imaging modalities and procedures
- 2.1.7. Pharmacology as applied to Pediatric Radiology, particularly with respect to diagnostic agents, including but not limited to contrast material, sedation, and interventional procedures
- 2.1.8. Fundamentals of quality assurance/improvement in Pediatric Radiology
- 2.1.9. Safe use of radiation and understanding of the biological effects of radiation

- 2.2. Describe the CanMEDS framework of competencies relevant to Pediatric Radiology
- 2.3. Apply lifelong learning skills of the Scholar Role to implement a personal program to keep up-to-date and enhance areas of professional competence
- 2.4. Integrate the available best evidence and best practices to enhance the quality of care and patient safety in Pediatric Radiology

3. Perform a complete and appropriate assessment of a patient

- 3.1. Identify and effectively explore issues to be addressed in a patient encounter, including the patient's context and preferences
- 3.2. Elicit a history that is relevant, concise, and accurate to context and preferences for the purposes of diagnosis, management, health promotion, and disease prevention
- 3.3. Perform a focused physical examination that is relevant and accurate for the purposes of diagnosis, management, health promotion, and disease prevention
- 3.4. Select medically appropriate investigative methods in a resource-effective and ethical manner
- 3.5. Demonstrate effective clinical problem solving and judgment to address patient problems, including interpreting available data and integrating information to generate differential diagnoses and management plans
 - 3.5.1. Manage immediate complications of procedures and medical emergencies within the radiology department

4. Use preventive and therapeutic interventions effectively

- 4.1. Implement a management plan in collaboration with a patient and the patient's family
- 4.2. Demonstrate appropriate and timely application of preventive and therapeutic interventions relevant to Pediatric Radiology
- 4.3. Ensure appropriate informed consent is obtained for therapies
- 4.4. Ensure patients receive appropriate end-of-life care as it relates to Pediatric Radiology

5. Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic

- 5.1. Demonstrate effective, appropriate, and timely performance of diagnostic procedures relevant to Pediatric Radiology, including but not limited to:
 - 5.1.1. Diagnostic and interpretive skills related to imaging of pediatric patients using plain film, ultrasound, computed tomography (conventional and PET), magnetic resonance imaging, fluoroscopy, and nuclear medicine studies
 - 5.1.2. Manual and procedural skills, including but not limited to intussusception reduction and fluoroscopic procedures
 - 5.1.3. Computer skills in optimizing imaging acquisition and use of post-processing tools
- 5.2. Demonstrate effective, appropriate, and timely performance of therapeutic procedures relevant to Pediatric Radiology, including but not limited to therapy for meconium ileus and intussusception reduction
- 5.3. Ensure appropriate informed consent is obtained for procedures
- 5.4. Document and disseminate information related to procedures performed and their outcomes
- 5.5. Ensure adequate followup is arranged for procedures performed
 - 5.5.1. Manage post-procedure care following interventional procedures

6. Seek appropriate consultation from other health professionals, recognizing the limits of their own expertise

- 6.1. Demonstrate insight into their own limits of expertise
- 6.2. Demonstrate effective, appropriate, and timely consultation of another health professional as needed for optimal patient care
- 6.3. Recommend appropriate followup care services for patients and their families/caregivers

Communicator

Definition:

As *Communicators*, Pediatric Radiologists effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Develop rapport, trust, and ethical relationships with patients and families

- 1.1. Recognize that being a good communicator is a core clinical skill for physicians, and that effective physician-patient communication can foster patient satisfaction, physician satisfaction, adherence, and improved clinical outcomes
- 1.2. Establish positive relationships with patients and their families that are characterized by understanding, trust, respect, honesty, and empathy
- 1.3. Respect patient confidentiality, privacy, and autonomy
- 1.4. Listen effectively
- 1.5. Be aware of and responsive to nonverbal cues
- 1.6. Facilitate a structured clinical encounter effectively
- 1.7. Recognize and communicate with pediatric patients of varying levels of maturity, both intellectually and emotionally

2. Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals

- 2.1. Gather information about a disease and about a patient's beliefs, concerns, expectations, and illness experience
- 2.2. Seek out and synthesize relevant information from other sources, such as a patient's family, caregivers, and other professionals

3. Convey relevant information and explanations accurately to patients and families, colleagues, and other professionals

- 3.1. Deliver information to a patient and family, colleagues, and other professionals in a humane manner and in such a way that it is understandable and encourages discussion and participation in decision-making
- 3.2. Convey information to the referring physician in a timely fashion when faced with urgent or life-threatening situations

4. Develop a common understanding on issues, problems, and plans with patients, families, and other professionals to develop a shared plan of care

- 4.1. Identify and effectively explore problems to be addressed from a patient encounter, including the patient's context, responses, concerns, and preferences

- 4.2. Respect diversity and differences, including but not limited to the impact of gender, religion, and cultural beliefs on decision-making
- 4.3. Encourage discussion, questions, and interaction in the encounter
- 4.4. Engage patients, families, and relevant health professionals in shared decision-making to develop a plan of care
- 4.5. Address challenging communication issues effectively, such as obtaining informed consent, delivering bad news, and addressing anger, confusion and misunderstanding

5. Convey effective oral and written information about a medical encounter

- 5.1. Maintain clear, accurate, and appropriate records of clinical encounters and plans
- 5.2. Present oral reports of clinical encounters and plans
- 5.3. Present medical information to the public or media about a medical issue

Collaborator

Definition:

As *Collaborators*, Pediatric Radiologists work effectively within a health care team to achieve optimal patient care.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Participate effectively and appropriately in an interprofessional health care team

- 1.1. Describe the Pediatric Radiologist's roles and responsibilities to other professionals
- 1.2. Describe the roles and responsibilities of other professionals within the health care team
- 1.3. Recognize and respect the diverse roles, responsibilities, and competencies of other professionals in relation to their own
- 1.4. Work with others to assess, plan, provide, and integrate care for individuals and groups of patients
 - 1.4.1. Work with and advise community radiologists and primary caregivers with respect to their pediatric patients
 - 1.4.2. Work with other health care professionals to ensure that the safest and most appropriate imaging modalities are used, particularly with respect to exposure to ionizing radiation
- 1.5. Work with others to assess, plan, provide, and review other tasks, such as research problems, educational work, program review, or administrative responsibilities
- 1.6. Participate in interprofessional team meetings

- 1.7. Enter into interdependent relationships with other professions for the provision of quality care
- 1.8. Describe the principles of team dynamics
- 1.9. Respect team ethics, including confidentiality, resource allocation, and professionalism
- 1.10. Demonstrate leadership in a health care team, as appropriate

2. Work with other health professionals effectively to prevent, negotiate, and resolve interprofessional conflict

- 2.1. Demonstrate a respectful attitude towards other colleagues and members of an interprofessional team
- 2.2. Work with other professionals to prevent conflicts
- 2.3. Employ collaborative negotiation to resolve conflicts
- 2.4. Respect differences and address misunderstandings and limits of scope of practice in other professions
- 2.5. Recognize one's own differences, misunderstanding, and limitations that may contribute to interprofessional tension
- 2.6. Reflect on interprofessional team function

3. Work with parents and caregivers to provide optimal imaging and care

Manager

Definition:

As *Managers*, Pediatric Radiologists are integral participants in health care organizations, organizing sustainable practices, making decisions concerning the allocation of resources, and contributing to the effectiveness of the health care system.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Participate in activities that contribute to the effectiveness of their health care organizations and systems

- 1.1. Work collaboratively with others in their organizations
- 1.2. Participate in systemic quality process evaluation and improvement, such as patient safety initiatives
- 1.3. Describe the structure and function of the health care system as it relates to Pediatric Radiology, including the roles of physicians
- 1.4. Describe principles of health care financing, including physician remuneration, budgeting, and organizational funding

- 1.5. Work with and advise health authorities with regard to provision of resources for pediatric imaging in the community

2. Manage their practice and career effectively

- 2.1. Set priorities and manage time to balance patient care, practice requirements, outside activities, and personal life
- 2.2. Manage a practice, including finances and human resources
- 2.3. Implement processes to ensure personal practice improvement
- 2.4. Employ information technology appropriately for patient care

3. Allocate finite health care resources appropriately

- 3.1. Recognize the importance of just allocation of health care resources, balancing effectiveness, efficiency, and access with optimal patient care
- 3.2. Apply evidence and management processes for cost-appropriate care

4. Serve in administration and leadership roles

- 4.1. Chair or participate effectively in committees and meetings
- 4.2. Lead or implement change in health care
- 4.3. Plan relevant elements of health care delivery (e.g., work schedules)

Health Advocate

Definition:

As *Health Advocates*, Pediatric Radiologists use their expertise and influence responsibly to advance the health and well-being of individual patients, communities, and populations.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Respond to individual patient health needs and issues as part of patient care

- 1.1. Identify the health needs of an individual patient
- 1.2. Identify opportunities for advocacy, health promotion, and disease prevention with individuals to whom they provide care
 - 1.2.1. Identify and support referrals for appropriate diagnostic or therapeutic procedures that are not available

2. Respond to the health needs of the communities that they serve

- 2.1. Describe the practice communities that they serve
- 2.2. Identify opportunities for advocacy, health promotion, and disease prevention in the communities that they serve, and respond appropriately
 - 2.2.1. Advocate for resources for emerging imaging technology, including research resources
 - 2.2.2. Explain and communicate the benefits and risks of ionizing radiation incurred during imaging studies in pediatric patients
- 2.3. Demonstrate an appreciation of the possibility of competing interests between the communities served and other populations
- 2.4. Develop guidelines for the appropriate imaging of pediatric patients, utilizing the resources that exist in the community to minimize exposure to radiation, recognizing the benefits and limitations of varying imaging modalities

3. Identify the determinants of health for the populations that they serve

- 3.1. Identify the determinants of health of the population, including barriers to access to care and resources
- 3.2. Identify vulnerable or marginalized populations within those served and respond appropriately

4. Promote the health of individual patients, communities, and populations

- 4.1. Describe an approach to implementing a change in a determinant of health of the populations they serve
- 4.2. Describe how public policy impacts on the health of the populations served
- 4.3. Identify points of influence in the health care system and its structure
- 4.4. Describe the ethical and professional issues inherent in health advocacy, including altruism, social justice, autonomy, integrity, and idealism
- 4.5. Demonstrate an appreciation of the possibility of conflict inherent in their role as a health advocate for a patient or community with that of manager or gatekeeper
- 4.6. Describe the role of the medical profession in advocating collectively for health and patient safety

Scholar

Definition:

As *Scholars*, Pediatric Radiologists demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Maintain and enhance professional activities through ongoing learning

- 1.1. Describe the principles of maintenance of competence
- 1.2. Describe the principles and strategies for implementing a personal knowledge management system
- 1.3. Recognize and reflect on learning issues in practice
- 1.4. Conduct personal practice audits
- 1.5. Pose an appropriate learning question
- 1.6. Access and interpret the relevant evidence
- 1.7. Integrate new learning into practice
- 1.8. Evaluate the impact of any change in practice
- 1.9. Document the learning process

2. Critically evaluate medical information and its sources, and apply this appropriately to practice decisions

- 2.1. Describe the principles of critical appraisal
- 2.2. Critically appraise retrieved evidence in order to address a clinical question
- 2.3. Integrate critical appraisal or evidence-based conclusions into clinical care, including but not limited to appropriate use of radiation and sedation

3. Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others

- 3.1. Describe principles of learning relevant to medical education
- 3.2. Identify collaboratively the learning needs and desired learning outcomes of others
- 3.3. Select effective teaching strategies and content to facilitate others' learning
- 3.4. Deliver effective lectures or presentations
- 3.5. Assess and reflect on a teaching encounters
- 3.6. Provide effective feedback
- 3.7. Describe the principles of ethics with respect to teaching

4. Contribute to the development, dissemination, and translation of new knowledge and practices

- 4.1. Describe the principles of research and scholarly inquiry
- 4.2. Describe the principles of research ethics
- 4.3. Pose a scholarly question
- 4.4. Conduct a systematic search for evidence
- 4.5. Select and apply appropriate methods to address the question
- 4.6. Disseminate the findings of a study

Professional

Definition:

As *Professionals*, Pediatric Radiologists are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour.

Key and Enabling Competencies: Pediatric Radiologists are able to...

1. Demonstrate a commitment to their patients and parents/caregivers, profession, and society through ethical practice

- 1.1. Exhibit appropriate professional behaviours in practice, including honesty, integrity, commitment, compassion, respect, and altruism
- 1.2. Demonstrate a commitment to delivering the highest quality care and maintenance of competence
- 1.3. Recognize and appropriately respond to ethical issues encountered in practice
- 1.4. Recognize and manage real or perceived conflicts of interest
- 1.5. Recognize the principles and limits of patient confidentiality as defined by professional practice standards and the law
- 1.6. Maintain appropriate relations with patients and their families

2. Demonstrate a commitment to their patients, profession, and society through participation in profession-led regulation

- 2.1. Demonstrate knowledge and understanding of professional, legal, and ethical codes of practice, including but not limited to the ALARA (As Low as Reasonably Achievable) principles for limiting exposure to ionizing radiation
- 2.2. Fulfil the regulatory and legal obligations required of current practice
- 2.3. Demonstrate accountability to professional regulatory bodies
- 2.4. Recognize and respond to others' unprofessional behaviours in practice
- 2.5. Participate in peer review

3. Demonstrate a commitment to physician health and sustainable practice

- 3.1. Balance personal and professional priorities to ensure personal health and a sustainable practice
- 3.2. Strive to heighten personal and professional awareness and insight
- 3.3. Recognize other professionals in need and respond appropriately

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