

2013

**EDITORIAL REVISION – MAY 2017
VERSION 2.1**

This document applies to those who begin training on or after July 1st, 2013.

DEFINITION

Pediatric Cardiology is that branch of medicine concerned with the study of congenital cardiac malformations, acquired heart diseases and abnormalities of the systemic and pulmonary circulations in the fetus, newborn, child and young adult.

GOALS

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

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

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

NOTE

Throughout this document, the term "cardiovascular/cardiological" is understood to refer to the cardiovascular system, the peripheral vascular system, the pulmonary circulation, the innervation and/or neurohumoral control and regulation of cardiac function, and hormonal and/or pharmacological influences as these may relate to the cardiovascular system.

PEDIATRIC CARDIOLOGY 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 Cardiologists integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centered care. *Medical Expert* is the central physician Role in the CanMEDS framework.

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

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

- 1.1. Perform a consultation, including the presentation of well-documented assessments and recommendations in written and/or verbal form in response to a request from another health care professional
- 1.2. Demonstrate use of all CanMEDS competencies relevant to their practice
- 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-centered care for a pediatric population
- 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 their practice

- 2.1. Apply knowledge of the clinical, socio-behavioural, and fundamental biomedical sciences relevant to Pediatric Cardiology, including the:
 - 2.1.1. Clinical features, including presenting signs and symptoms, natural history, prognosis, genetic implications, and life style effects of all major structural and acquired heart diseases
 - 2.1.2. Clinical course of diseases in related organ systems that may impact the cardiovascular system
 - 2.1.3. Embryological development of the cardiovascular system and pathogenesis of congenital malformations
 - 2.1.4. Gross and microscopic anatomy of the cardiovascular system, the associated vascular trunks, muscular and fibrous supports
 - 2.1.5. Anatomy, composition and physiology of cardiac muscle
 - 2.1.5.1. Mechanism underlying the resting membrane potential, conduction of an action potential and transmission of electrical stimuli through the myocyte
 - 2.1.5.2. Ion transport within the cell

OBJECTIVES OF TRAINING IN PEDIATRIC CARDIOLOGY (2013)

- 2.1.6. Cardiac enzymes, including their interaction, distribution and timing in myocardial injury
 - 2.1.7. Anatomy, function and disorders of the pericardium/coronary arterial flow and oxygen delivery to the myocytes
 - 2.1.8. Disorders of coronary arterial formation, including position and distribution, which may lead to myocardial ischemia
 - 2.1.9. Abnormalities and disorders of the immune system and infectious processes which may influence the myocardium or vascular system
 - 2.1.10. Role of exercise in changing cardiac physiology
 - 2.1.11. Influence of teratogens, such as infection and drugs, on development of the fetal heart
 - 2.1.12. Indications, mechanisms of action and the side effects of medications used in the therapy of cardiac disorders
 - 2.1.13. The importance of a healthy lifestyle in the prevention of cardiovascular disease, including the role of smoking, lipids, diet and exercise
 - 2.1.14. Role and influence of heredity, disorders of the gene, other biochemical and metabolic disturbances which may influence cardiac development and/or function
 - 2.1.15. Influence of therapies for other medical conditions, such as malignancies, which may have important secondary effects on myocardial function
 - 2.1.16. General principles of cardiopulmonary bypass and extracorporeal cardiac support, and their long term impact on neurodevelopment
 - 2.1.17. General principles, cardiac surgeries, cardiac structures and various types of reconstruction
 - 2.1.18. Role of cardiac transplantation and other myocardial support devices in the treatment of end-stage cardiac failure
 - 2.1.19. Indications for the use of pacemakers and implantable cardioverter defibrillators
 - 2.2. Describe the CanMEDS framework of competencies relevant to Pediatric Cardiology
 - 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. Contribute to the enhancement of quality care and patient safety in their practice, integrating the available best evidence and best practices
- 3. Perform a complete and appropriate assessment of a Pediatric Cardiology patient**
- 3.1. Identify and explore issues to be addressed in a patient encounter effectively, 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 prevention and health promotion, diagnosis and/or management

- 3.3. Perform a focused physical examination that is relevant and accurate for the purposes of prevention and health promotion, diagnosis and/or management
- 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

4. Use preventive and therapeutic interventions effectively

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

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

- 5.1. Demonstrate effective, appropriate and timely interpretation, application of results and technical performance of the following diagnostic and therapeutic procedures:
 - 5.1.1. Clinical Electrophysiology
 - 5.1.1.1. Electrocardiography
 - 5.1.2. Echocardiography (M-mode, 2D and Doppler)
 - 5.1.2.1. Transthoracic
 - 5.1.2.2. Transoesophageal
 - 5.1.3. Therapeutic Procedures
 - 5.1.3.1. Pericardiocentesis
 - 5.1.3.2. DC cardioversion and defibrillation
 - 5.1.3.3. Balloon atrial septostomy
- 5.2. Demonstrate effective, appropriate and timely interpretation and application of results of the following diagnostic and therapeutic procedures:
 - 5.2.1. Clinical Electrophysiology
 - 5.2.1.1. Ambulatory monitors (Holter and loop recorders)
 - 5.2.1.2. Exercise (stress) testing
 - 5.2.1.3. Permanent pacemakers and implanted devices
 - 5.2.1.4. Invasive electrophysiology studies

- 5.2.2. Echocardiography (M-mode, 2D and Doppler)
 - 5.2.2.1. Fetal
- 5.2.3. Cardiac Catheterization
 - 5.2.3.1. Right and left heart catheterization and hemodynamics
 - 5.2.3.2. Angiography
- 5.2.4. Others Modalities of Cardiac Imaging
 - 5.2.4.1. Chest X-Ray
 - 5.2.4.2. Computed Tomography (CT) scan
 - 5.2.4.3. Magnetic Resonance Imaging (MRI)
- 5.3. Demonstrate effective, appropriate and timely application of results of the following diagnostic and therapeutic procedures:
 - 5.3.1. Echocardiography (M-mode, 2D and Doppler)
 - 5.3.1.1. Stress
 - 5.3.2. Others Modalities of Cardiac Imaging
 - 5.3.2.1. Rest and stress perfusion imaging
 - 5.3.3. Therapeutic Procedures
 - 5.3.3.1. Interventional catheterization
- 5.4. Ensure appropriate informed consent is obtained for procedures
- 5.5. Document and disseminate information related to procedures performed and their outcomes
- 5.6. Ensure adequate follow-up is arranged for procedures performed
- 6. Seek appropriate consultation from other health professionals, recognizing the limits of their expertise**
 - 6.1. Demonstrate insight into their own limitations of expertise
 - 6.2. Demonstrate effective, appropriate, and timely consultation of another health professional as needed for optimal patient care
 - 6.3. Arrange appropriate follow-up care services for a patient and their family

Communicator

Definition:

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

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

1. Develop rapport, trust, and ethical therapeutic 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 therapeutic 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

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, encourages discussion and participation in decision-making
 - 3.1.1. Communicate effectively with colleagues regarding investigation and reporting of investigative/interventional procedures

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

- 4.2. Respect diversity and difference, 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 (e.g., written or electronic) of clinical encounters and plans
- 5.2. Present verbal 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 Cardiologists effectively work within a health care team to achieve optimal patient care.

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

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

- 1.1. Clearly describe the Pediatric Cardiologist'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 diversity of roles, responsibilities and competences of other professionals in relation to their own
- 1.4. Work with others to assess, plan, provide and integrate care for individual patients (or groups of patients)
- 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 limitations in other professionals
- 2.5. Recognize one's own differences, misunderstanding and limitations that may contribute to interprofessional tension
- 2.6. Reflect on interprofessional team function

Manager

Definition:

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

Key and Enabling Competencies: Pediatric Cardiologists 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 Cardiology, including the advantages and disadvantages of Pediatric Cardiology care in a variety of settings, including hospitals, ambulatory care clinics, offices, homecare, and chronic care and rehabilitation facilities
- 1.4. Describe principles of health care financing, including physician remuneration, budgeting and organizational funding

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 Pediatric Cardiology 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
 - 3.2.1. Demonstrate an understanding of the cost and cost-effectiveness of therapeutic and preventive health programs
 - 3.2.2. Identify the role that may be played by disease focused groups with regard to helping the patient and/or family facilitate recovery, coping, and acquiring information

4. Serve in administration and leadership roles, as appropriate

- 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 Cardiologists responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.

Key and Enabling Competencies: Pediatric Cardiologists 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
 - 1.1.1. Learn about community resources and related patient support groups
 - 1.1.2. Provide assistance in accessing programs (such as home oxygen, home medication provisions, occupational health and physiotherapy, drug plans)
- 1.2. Identify opportunities for advocacy, health promotion and prevention of cardiovascular disorders, including risk factors, and genetic and environmental concerns with individuals to whom they provide care, which includes:
 - 1.2.1. Recognize that complete patient care requires a correct diagnosis as well as a search for risk factors for the disorder

OBJECTIVES OF TRAINING IN PEDIATRIC CARDIOLOGY (2013)

- 1.2.2. Recognize that treatment for a patient with a cardiovascular disease may require the elimination of risk factors and genetic counseling
- 1.2.3. Counsel patients and their families in understanding their disease, and the potential for future manipulation/intervention to improve their well-being

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
- 2.3. Appreciate the possibility of competing interests between the communities served and other populations

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

- 3.1. Identify the determinants of health of the populations, 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
 - 4.3.1. Describe the role of national and international bodies (for example the provincial and national Heart and Stroke Foundation, Canadian Cardiovascular Society and international cardiac societies) in the promotion of cardiovascular health, and the prevention, detection and treatment of cardiac disorders
- 4.4. Describe the ethical and professional issues inherent in health advocacy, including altruism, social justice, autonomy, integrity and idealism
- 4.5. Appreciate 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 Cardiologists demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge.

Key and Enabling Competencies: Pediatric Cardiologists 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 a personal practice audit
- 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 conclusions into clinical care

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

- 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. Demonstrate an effective lecture or presentation
- 3.5. Assess and reflect on a teaching encounter
- 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 by presentation or publication
- 4.7. Complete a scholarly research, quality assurance, or educational project relevant to Pediatric Cardiology that is suitable for peer-reviewed publication or presentation at an academic meeting

Professional

Definition:

As *Professionals*, Pediatric Cardiologists 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 Cardiologists are able to...

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

- 1.1. Exhibit appropriate professional behaviors 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. Manage 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 boundaries with patients

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

- 2.1. Demonstrate knowledge and an understanding of the professional, legal and ethical codes of practice, including:
 - 2.1.1. Preparation of timely and accurate medical-legal reports
 - 2.1.2. Responses to regulatory bodies

OBJECTIVES OF TRAINING IN PEDIATRIC CARDIOLOGY (2013)

- 2.1.3. Notification of coroners
- 2.1.4. Substitute decision making

- 2.2. Fulfill 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

REVISED – Specialty Standards Review Committee – April 2010

REVISED – Office of Specialty Education – April 2013

REVISED – Office of Specialty Education – May 2017