ABSTRACT

Interventional cardiology is a subspecialty of adult cardiology dedicated to the use and application of imaging-based diagnostic techniques and minimally invasive modalities for the treatment of cardiovascular disease. Currently, interventional cardiologists must demonstrate expert knowledge of cardiac imaging, along with cardiovascular anatomy and the pathophysiology of cardiovascular disease. In addition, they must possess the technical skills required for the practice of interventional cardiology and be knowledgeable about new antiplatelet and antithrombotic drugs mandated for optimal patient care. The 2010 Canadian Cardiovascular Society/Canadian Association of Interventional Cardiologists Guidelines for Training and Maintenance of Competency in Adult Interventional Cardiology are the first such guidelines to be published in Canada. These guidelines should allow for more fluid provision of high-quality interventional cardiology education, along with less geographic variation, resulting in more widespread high-level services to the population.
Recommendations for specific documentation of the training received have also been made in an effort to garner national recognition for the trainee, the institution, and the mentors and teachers responsible for that training.

**Training Objectives**

On completion of the IC training program, the trainee will be able to function as a consultant in the essential roles and key competencies of cardiologists (medical expert/clinical decision maker, communicator, collaborator, manager, health advocate, scholar, and professional) and of interventional cardiologists (expert in minimally invasive diagnosis and treatment of cardiovascular diseases). Interventional trainees will be able to apply their knowledge, skills, and attitudes to a wide range of cardiovascular pathologies, including coronary artery disease, valvular and congenital heart disease, congestive heart failure and other cardiomyopathies, pulmonary vascular disease, and pericardial disease.

Trainees will also display technical competence in the use of a variety of modalities, as well as understand the indications, contraindications, and potential complications associated with each intervention. Within each of these essential roles and competencies, the guidelines define specific objectives that must be met; an overriding objective is, however, to integrate all CanMEDS roles to provide optimal, ethical, and patient-centred medical care.

At the same time, trainees will be able to establish effective relationships with patients and families, work and communicate well within a health care team, work collaboratively with others in the organization, and use their expertise to advance the health and well-being of the public.

Last, IC residents will be encouraged to carry out research projects during their training, under appropriate faculty supervision.

**Specialty Training Requirements**

In order to be eligible for an IC training program, candidates must be able to function in all essential roles and key competencies of cardiologists, as detailed in the new guidelines. Trainees should be Royal College of Physicians and Surgeons of Canada (RCPSC) cardiology certified or eligible for RCPSC examinations in cardiology or its equivalent, equivalency including at least the following:

- 8 months of clinical cardiology (including at least 4 months in a coronary care unit)
- 3 months of cardiac catheterization
- 4 months of echocardiography
- 1 month of electrophysiology
- 1 month of noninvasive imaging (to include nuclear cardiology and stress testing)

Foreign-trained cardiologists will require demonstration of equivalency for entrance.

The IC program mandates 2 years’ training in an approved IC training program. Training will include the core experiences shown in Table 1. Some learning experiences can occur simultaneously or longitudinally.

Trainees must also acquire 8 additional blocks (32 weeks) of elective service, which may be done longitudinally but which may include a number of electives; any elective chosen must be approved by the program director, with appropriate evaluation by the rotation supervisor. Electives may include the following:

- Additional research in cardiovascular medicine
- Continuing medical education module development in IC, with completion of a project to the satisfaction of the fellowship training committee
- Formal training in research methodology or education
- Training in pediatric IC (may include IC for adult congenital heart disease)
- IC for structural heart disease
- Training in computed tomographic angiography

**Standards of Accreditation for Residency Programs**

A university wishing to have a program in IC accredited must also sponsor a program in adult cardiology accredited by the RCPSC or be affiliated with a centre with an accredited program in adult cardiology. In addition, the university’s professors would have cross appointments with said institution. Detailed accreditation criteria can be found in the complete document.

**Re-entry Criteria and Maintenance of Competency**

Entry criteria into the IC training program for clinical cardiologists already in practice are identical to those of a newly graduated cardiologist; for invasive cardiologists already performing diagnostic angiography—and who have completed a minimum of 500 cases as the primary operator in the preceding 3 years of practice—a minimum of 13 blocks (52 weeks) of total IC training is required. For invasive cardiologists already doing angiography but who have not completed a minimum of 500 cases as primary operator in the preceding 3 years of practice, entry criteria for the IC training program would be identical to those of a newly graduated cardiologist. In all instances, training must be done in an accredited institution other than the institution of practice.

Specifically, re-entry requires a total of 13 blocks, as follows:

- 10 blocks of IC catheterization and 250 cases as the primary operator per year
- 1 block of interventional ambulatory care and consultation service
- 2 blocks of research in cardiovascular medicine, with completion of a research project.
The RCPSC’s maintenance-of-competency program requires a minimum of 40 credits in each year of a cycle. Cardiologists must participate in continuing professional development activities and report the outcomes of these activities. The minimum target is 400 credits during 1 cycle span (5 years).

For maintenance of competency (MOC) in IC, the allocation of MOC hours should reflect the practice type and self-assessment of education needs as they pertain to the practice of IC, as well as meet the RCPSC’s requirements for the current MOC program.

**Conclusions**

The complexity of the practice of IC is increasing for a number of reasons: acute coronary syndromes are more often treated in the catheterization lab, the decision making and approach to complex patients are more challenging, and mastery of new and expensive technologies necessitates knowledge of the indications for and appropriate use of these new technologies, as inappropriate use can harm patients.

The new guidelines will therefore address a previously unmet need for standardized teaching and evaluation of interventionalists and help provide graduates with formally recognized skills that should lead to consistently high-quality care and worldwide recognition of their competencies.

**Disclosures**

The authors have no conflicts of interest to disclose.