Diagnostic Imaging

Training Requirement Standards
Diagnostic Imaging Modality Approval

June 2017
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1.0 Introduction

Alberta’s Health Professions Act provides for the accreditation of medical services in non-hospital facilities by the College of Physicians and Surgeons of Alberta. Section 8.1 in Schedule 21 of the Act states:

8.1(1) A regulated member shall not provide a prescribed health service, or cause a prescribed health service to be provided, in a facility unless the facility is an accredited medical facility or a facility referred to in subsection (2).

(2) Subsection (1) does not apply with respect to a prescribed health service provided in

(a) an approved hospital within the meaning of the Hospitals Act,
(b) a hospital operated by the Government of Canada,
(c) a health care facility operated by the Government of Canada or the Government of Alberta,
(d) a hospital, clinic or centre operated by a regional health authority under the Regional Health Authorities Act,
(e) a facility within the meaning of the Mental Health Act or an accredited health centre established for the purpose of section 49(b) of the Mental Health Act, or
(f) a facility that is prescribed in the regulations.

Diagnostic Imaging services are one of many health services for which the College requires accreditation. A complete list of prescribed health services is contained in the College’s by-laws and available on the College’s website.

The College also applies its accreditation standards to diagnostic imaging services in approved hospitals through contract with Alberta Health Services and Covenant Health.

The Advisory Committee on Diagnostic Imaging is a standing committee of the College of Physicians and Surgeons of Alberta which advises the Medical Facility Accreditation Committee (MFAC) of the College with respect to all matters pertaining to Diagnostic Imaging facilities.

The principal function of the Committee is to ensure high standards of medical practice in diagnostic imaging facilities.

The Committee may consider issues related to the provision of diagnostic imaging services, including electronic transmission of studies, for general radiography, ultrasound, echocardiography, nuclear medicine, mammography, magnetic resonance imaging, bone densitometry, computerized tomography and positron emission tomography. Activities may include, but are not restricted to the following:

1. Approval and training of physicians in all imaging modalities;
2. Accreditation of imaging facilities;
3. Development and maintenance of standards for imaging procedures;
4. Promotion of safe and effective practices in imaging facilities;
5. Review and audit of the ownership of the facilities to ensure compliance with relevant College By-laws;
6. Consultation on the introduction of new modalities/technologies.

The College requires all accredited medical facilities to have a Medical Director (i.e. a practitioner who is registered with the Alberta College of Physicians and Surgeons) who is accountable for the practice of medicine within the facility. Medical Directors shall be satisfied as to the standing of other professionals with their respective regulatory bodies and to the safety of their practices.

For those facilities where the Medical Director does not have the expertise in the particular imaging modality, the services of a consultant are required.
This document incorporates standards and guidelines in a diagnostic and treatment facility approved by the MFAC/Council:

- “shall” is used when a section is a requirement for accreditation;
- “should” is used when a section is recommended; and
- “may” is used when a section is discretionary.

Due to the constantly changing spectrum of medical imaging, these standards/guidelines will be reviewed on a regular basis and revised when necessary. Input from facilities is encouraged to assist in keeping this document up-to-date.

For the purpose of these standards, “public facilities” mean those which are operated by Alberta Health Services and Covenant Health “private facilities” mean those which are not.
3.0 **Physician Approval**

Physicians providing services in Echocardiography, Magnetic Resonance Imaging (MRI), Nuclear Medicine, Positron Emission Tomography (PET), Ultrasound, and Computed Tomography shall have prior approval by the College.


3.1 **Echocardiography**

3.1.1 **Full Approval - Transthoracic Echocardiography (TTE)**
1. Shall be licensed to practice in Alberta as a specialist; **and**
2. Shall have completed a six month cumulative didactic training program in dedicated echocardiography facilities that are recognized and acceptable to the College; **and**
3. Interpreted at least 450 transthoracic echo (TTE) cases of which 150 TTE cases were directly performed; **and**
4. Shall provide a letter from the preceptor(s) attesting to competence.

3.1.2 **Full Approval - Transesophageal Echocardiography (TEE)**
1. Shall have full approval for Transthoracic Echocardiography (TTE) **and**
2. Performed 100 cumulative cases of transesophageal (TEE), **and**
3. Shall provide a letter from the preceptor attesting to competence.

3.1.3 **Full Approval – Stress Echocardiography**
1. Shall have full approval for Transthoracic Echocardiography (TTE) **and**
2. Performed 100 cumulative cases of stress echo’s, **and**
3. Shall provide a letter from the preceptor attesting to competence.

3.1.4 **Full Approval - Contrast Echocardiography**
1. Shall have full approval for Transthoracic Echocardiography (TTE) **and**
2. Performed 20 cumulative contrast cases and interpreted 20 cumulative contrast cases, **and**
3. Shall provide a letter from the preceptor attesting to competence.

3.1.5 **Restricted Approval – Perioperative Transesophageal Echocardiography (TEE) for Anesthesiologists**
1. **Level 2 approval (to perform and interpret):**
   a) Shall be licensed to practice in Alberta as an anesthesiologist; **and**
   b) Shall have completed a one year fellowship in cardiac anesthesia with echocardiography training; **or**
   c) Shall have completed a six month cumulative didactic training program in a dedicated echocardiography lab that is recognized and acceptable to the College; **and**
   d) Shall have interpreted a minimum of 300 cumulative echocardiographic studies, including a minimum of 200 cumulative perioperative TEE studies personally performed, interpreted and reported.
   e) These studies must have been completed within a two year time frame, **and**
   f) Successful completion of the perioperative TEE examination*.

2. **Level 3 approval (to perform, interpret and direct):**
   a) Shall be licensed to practice in Alberta as an anesthesiologist; **and**
   b) Have completed either a one year fellowship in cardiac anesthesia with echocardiography training; **or**
   c) Shall have completed a nine month cumulative didactic training program in a dedicated echocardiography lab that is recognized and acceptable to the College; **and**
d) Shall have interpreted a minimum of 450 cumulative echocardiographic examinations, including a minimum of 300 perioperative TEE studies personally performed, interpreted and reported.

e) These studies must have been completed within a two year time frame, and

f) Successful completion of the perioperative TEE examination**.

*Note: The following will be used as a guide in reviewing requests for Echocardiography:

- Original training;
- Content of a training program, including an expectation of:
  - Facility to be University affiliated
  - Facility workload (volume and caseload)
  - Review of submitted logbook of cases
- Credentials of the preceptor and details contained in the letter attesting to his or her satisfaction with the applicant’s abilities;
- **Current guidelines/recommendations/examinations as championed by the cardiovascular section of the Canadian Anesthesiologists’ Society (CAS), the Canadian Society of Echocardiography (CSE), and the Canadian Cardiovascular Society (CCS).

3.1.6 Re-approval

1. Physicians who have or qualify for full approval in echocardiography (TEE, stress, contrast), but have not been in active practice of echocardiography for the last two years, shall complete a minimum of one month of re-training which includes completing at least 100 studies; or

2. Have not been in active practice for the last five years, shall complete a minimum of three months of re-training, which includes completing at least 300 studies; and

3. Shall provide a letter from the preceptor attesting to competence.

3.1.7 Active Practice

1. Refers to performing a minimum of 100 echocardiography cases/year, or in the case of a physician limiting their practice to transesophageal echocardiography (TEE), a minimum of 60 cases/year.
3.2 Magnetic Resonance Imaging (MRI) - General

All training/experience for full or limited approval may be acquired in two-week blocks over a maximum span of two years. Full Approval entitles a physician to interpret and to direct an MRI facility, or a department within a diagnostic imaging facility. Limited Approval entitles a physician to interpret MRI studies only.

3.2.1 Full Approval

1. Shall be a radiologist licensed to practice in Alberta; and
2. Shall complete six months of training in an accredited facility acceptable to the College and under the supervision of a radiologist fully approved in MRI; or
3. Shall complete three months training in an accredited facility acceptable to the College and under the supervision of a radiologist fully approved in MRI, plus six months experience in an accredited facility under the supervision of a radiologist fully approved in MRI; and
4. Shall provide a letter from the preceptor, attesting to competence.

3.2.2 Limited Approval

1. Shall be a radiologist licensed to practice in Alberta; and
2. Shall complete three months of training in an accredited facility acceptable to the College and under the supervision of a radiologist fully approved in MRI; and
3. Shall provide a letter from the preceptor, attesting to competence.

3.2.3 Re-approval

1. Radiologists who have, or qualify for full or limited approval, but have not been in active practice of MRI for the last two years, shall complete a minimum of one month of retraining at an accredited MRI facility, which includes completing approximately 100 cases; or
2. Have not been in active practice of MRI for the last five years, shall complete a minimum of three months of retraining at an accredited MRI facility, which includes completing approximately 300 cases; and
3. Shall provide a letter from the preceptor, attesting to competence.

Note: The following will be used as a guide in reviewing requests for re-approval

• Original training;
• Experience in practice;
• Extent of related activity during the time away from relevant practice;
• Content of a retraining program, including an expectation of:
  • Completion over a reasonably brief time (i.e. weeks or months, but not years);
  • Review of relevant current literature;
  • Degree of supervision;
  • Method of evaluation of competence;
• Credentials of the preceptor and details contained in the letter attesting to his or her satisfaction with the applicant’s abilities.

3.2.4 Active Practice

Refers to performing 100 MRI cases/year.
3.3 Magnetic Resonance Imaging (MRI) - Cardiac

These requirements apply to the scope of cardiac MRI practice that includes evaluation of cardiac anatomy and function in adults and pediatric patients and evaluation of the thoracic aorta in the context of cardiac pathology. The latter may include assessment of post-stenotic aortic dilatation, coarctation of the aorta or dissection of the thoracic aorta presenting for cardiac assessment. The intended scope of this approval does not include other vascular or thoracic imaging. Likewise, evaluation of cardiac involvement by extra-cardiac pathology such as cancer continues to be within the domain of specialists with general MRI approval.

3.3.1 Full Approval

1. Diagnostic Radiologists:
   a) Shall be licensed to practice in Alberta; and
   b) Shall have Full Approval in MRI; and
   c) Shall have a minimum of three months of cardiac MRI training acceptable to the College.*

2. Cardiologists:
   a) Shall be licensed to practice in Alberta; and
   b) Shall have a minimum of six months of cardiac MRI training acceptable to the College.*

Radiologists and cardiologists whose MRI training is limited to cardiac MRI will have their MRI approval restricted to cardiac MRI.

Note: Although no distinction is made between interpreters and medical directors of cardiac MRI facilities, it is expected that medical directors will complete more than the minimum requirements set out above and that cardiac MRI will be a major portion of their imaging practice.

For those physicians who are in current Cardiac MRI practice, their training and experience will be reviewed on a case-by-case basis to determine its equivalence to the above standards.

Note: Acceptable cardiac training is defined as:

- Occurring in a training facility acceptable to the College as determined in consultation with experts in the field;
- Providing:
  - At least 50 hours of cardiac MRI coursework;
  - Supervised interpretation of at least 150 cardiac MR studies representing the range of abnormalities observed in practice. For at least 50 of these, the trainee must perform the analysis and make the initial interpretation.
- Being completed in blocks not less than one month in duration over a total period of not more than two years; and
- Being completed to the satisfaction of the training facility training director who attests to the learner’s preparedness for independent interpretation of cardiac MRI.
3.4 Nuclear Medicine

The following requirements are for in-vivo Nuclear Medicine and are not intended to affect pathologists utilizing in-vitro Nuclear Medicine techniques.

3.4.1 Full Approval
1. Shall be a physician certified in Nuclear Medicine by the Royal College of Physicians and Surgeons of Canada (effective January 1, 1993); and
2. Licensed to practice in Alberta.

Note: Prior to January 1, 1993, all physicians practicing Nuclear Medicine were given full approval by the College under the grandfather clause with the exception of those grandfathered for specific areas such as pediatrics or cardiology.

3.4.2 Limited Approval

Limited approval may be granted if a position of need can be established and a certified Nuclear Medicine specialist cannot be recruited after a reasonable period of time. The physician will receive approval to practice in-vivo Nuclear Medicine, but the practice will be limited to the sites for which the initial application was requested.

1. The physician shall be certified in Diagnostic Radiology and be licensed to practice in Alberta; and
2. Shall complete a minimum of one year of formal training in a recognized Nuclear Medicine teaching program; and
3. Shall provide a letter from the preceptor, attesting to competence.

3.4.3 Restricted Approval

Restricted approval shall be limited to a specialized area such as Cardiac or Pediatric Nuclear Medicine.

1. The physician shall be a specialist licensed to practice in Alberta; and
2. Shall complete one year of Nuclear Medicine training in a recognized teaching program; and
3. Shall provide a letter from the preceptor, attesting to competence.

3.4.4 Re-Approval

1. Physicians who have, or qualify for approval in Nuclear Medicine, but have not been in active practice of Nuclear Medicine for the last two years, shall complete a suggested minimum of one month of retraining in an accredited Nuclear Medicine Residency Training Program; or
2. Have not been in active practice of Nuclear Medicine for the last five years, shall complete a suggested minimum of three months of retraining in an accredited Nuclear Medicine Residency Training Program; and
3. Shall provide a letter from the preceptor, attesting to competence.

Note: The following will be used as a guide in reviewing requests for approval:
- Original Training;
- Experience in practice;
- Extent of related activity during time away from relevant practice;
- Content of a retraining program, including an expectation of:
  - Completion over a reasonably brief time (i.e. weeks or months, but not years);
  - Review of relevant current literature;
  - Degree of supervision;
  - Method of evaluation of competence;
• Credentials of the preceptor and details contained in the letter attesting to his or her satisfaction with the applicant’s abilities.

3.4.5 Active Practice
Refers to performing a minimum of 100 Nuclear Medicine studies/year

3.5 Positron Emission Tomography (PET)

3.5.1 Physicians seeking approval in PET:

1. Shall be licensed to practice in Alberta; and
2. Shall have full approval\(^1\) in Nuclear Medicine; and
3. Shall be in active Nuclear Medicine practice that includes a substantial proportion of the Nuclear Medicine studies performed in Alberta; and
4. Shall have a working knowledge of CT anatomy; and
5. Shall have completed approved instruction\(^2\) in PET incorporating several days of didactic education followed by the supervised interpretation of a minimum of 200 live cases.

Note: \(^1\) For more than ten years, “full approval” in nuclear medicine by this College has required certification in nuclear medicine from the Royal College of Physicians and Surgeons of Canada.

\(^2\) Approved instruction is completed within a 12 month period in a facility providing a broad spectrum of PET studies (such as full body PET for medical oncology) and is supervised by a preceptor recognized by peers as an expert in PET imaging.
3.6 Ultrasound

*see definitions for Point of Care Ultrasound and Consultative Diagnostic Ultrasound*

3.6.1 Full Approval

1. Diagnostic Radiologists
   a) Shall be licensed to practice in Alberta; and
   b) Shall complete a minimum of six months of full-time training and complete a minimum of 1000 studies at a tertiary care teaching ultrasound centre that is recognized and acceptable to the College; and
   c) Shall provide a letter from the preceptor attesting to competence and satisfactory completion of the training.

Note: Full Approval is for all areas of ultrasound except echocardiography.

3.6.2 Restricted Approval

1. Physicians and surgeons applying for approval in a focused area of ultrasound imaging relevant to their area of practice will be considered on a case by case basis, but at minimum:
   a) Shall be licensed to practice in Alberta; and
   b) Shall complete a minimum of six months full-time training in ultrasound imaging focused on the specific area consistent with their specialty, completing a documented minimum of 500 studies of which 150 are personally performed at a tertiary care teaching ultrasound centre that is recognized and acceptable to the College; and
   c) Shall provide a letter from the preceptor attesting to competence and satisfactory completion of the training.

2. Notwithstanding 3.6.2.1, the following will apply:

   1. Urologists for Prostatic Ultrasound
      a) Shall be licensed to practice in Alberta; and
      b) Shall complete a minimum of one month of full-time training in ultrasound imaging of the prostate gland completing a documented minimum of 80 studies, at a tertiary care teaching ultrasound centre that is recognized and acceptable to the College; and
      c) Shall provide a letter from the preceptor attesting to competence and satisfactory completion of the training.

   2. Cardiologists for Carotid Doppler
      a) Shall be licensed to practice in Alberta; and
      b) Shall have College approval in echocardiography; and
      c) Shall have successfully performed and interpreted a minimum of 200 carotid doppler studies:
         i) Under the direct supervision of a physician approved in cardiac ultrasound by this College (or with equivalent qualifications, if outside Alberta).
         ii) In a facility acceptable to the Committee as meeting university level training standards for these guidelines.
3.6.3 Re-Approval

1. Physicians who have, or qualify for approval in ultrasound, but have not been in active practice of ultrasound for the last two years, shall complete a minimum of one month of retraining; or
2. Have not been in active practice of ultrasound for the last five years, shall complete a minimum of three months of retraining; and
3. Shall provide a letter from the preceptor, attesting to competence.

Note: The following will be used as a guide in reviewing requests for approval:

- Original Training;
- Experience in practice;
- Extent of related activity during time away from relevant practice;
- Content of a retraining program, including an expectation of:
  - Completion over a reasonably brief time (i.e. weeks or months, but not years);
  - Review of relevant current literature;
  - Degree of supervision;
  - Method of evaluation of competence;
- Credentials of the preceptor and details contained in the letter attesting to his or her satisfaction with the applicant’s abilities.

3.6.4 Active Practice

Refers to performing a minimum of 100 ultrasound studies/year.
### 3.7 Computed Tomography (excluding Cardiac CT)

#### 3.7.1 Full Approval

1. Shall be a radiologist licensed to practice in Alberta; and
2. Shall have completed a radiology residency program accredited by the Royal College of Physicians and Surgeons of Canada within the past 2 years; or
3. Shall have been involved in the supervision, interpretation and reporting of 300 CT examinations in the past 2 years; and
4. Shall provide a letter from a preceptor or Chief of Service attesting to competence.

#### 3.7.2 Re-approval

1. Radiologists who have, or wish to qualify for full approval, but have not been in active practice* of CT for the last two years, shall complete a minimum of one month of retraining at an accredited CT facility, which includes completing approximately 100 cases; or
2. Have not been in active practice* of CT for the last five years, shall complete a minimum of three months of retraining at an accredited CT facility, which includes completing approximately 300 cases; and
3. Shall provide a letter from the preceptor attesting to competence.

*Active practice refers to performing 100 CT cases/year.

### 3.8 Computed Tomography – Cardiac and Coronary (Adult medicine only)

These requirements apply to a scope of cardiac CT (CCT) practice which includes the contrast-enhanced evaluation of cardiac chambers, coronary vessels and coronary bypass grafts and the non-enhanced evaluation of coronary calcium. These requirements do not include approvals necessary for other vascular or thoracic imaging. Pediatric CCT should be performed only by pediatric cardiologists or radiologists trained in the use of pediatric cardiac CT.

#### 3.8.1 Level 2 approval (to perform and interpret CCT but not to direct a CCT facility or department)

1. Shall be licensed to practice in Alberta as a specialist in Radiology or Cardiology; and
2. Shall have completed a program of training in CCT through didactic teaching and at least 150 total cases of ECG-gated contrast-enhanced CCT studies of which:
   a) At least 75 are coronary CTA studies that are directly acquired, reconstructed, interpreted and reported by the trainee on real patients (not merely research subjects) for whom an official report is subsequently placed on the permanent medical file under the mentorship of an expert CCT reader with Level 3 training; and
   b) At least 75 are gated contrast-enhanced thoracic CT cases that may include cardiac CT or other non-cardiac thoracic CT studies. These may be directly acquired and interpreted or in the case of cardiac CT, may be drawn from a case library or other teaching resource. Cardiologists will interpret cardiac CT studies. Radiologists may interpret cardiac or other gated thoracic CT studies. However, if non-cardiac gated thoracic CTs are chosen, these must be directly acquired; and
   c) At least 25 cases include a non-contrast CT for calcium scoring; and
   d) At least 25 cases are coronary CTA studies with correlation to invasive angiography. These may be acquired by the trainee or read from a case library. However, for cases obtained from a library, the original CTA dataset should be reviewed (not just pre-prepared 3D reconstructions) as well as the invasive angiography. The majority of the cases obtained from the library should be abnormal.
3. Shall provide a letter from the preceptor, attesting to competence in CCT; and
4. Shall continue in active CCT practice and participate in continuing professional development and quality assurance of CCT in order to remain competent.

3.8.2 **Level 3 (to direct a CCT facility or department and to interpret CCT for congenital heart disease)**

1. Shall be licensed to practice in Alberta as a specialist in Radiology or Cardiology; and
2. Shall have completed a program of training in CCT through didactic teaching and at least 300 total cases of ECG-gated contrast-enhanced CCT studies of which:
   a) At least 150 cases are coronary CTA studies that are directly acquired, reconstructed, interpreted and reported by the trainee on real patients (not merely research subjects) for whom an official report is subsequently placed on the permanent medical file under the mentorship of an expert CCT reader with Level 3 training; and
   b) At least 150 cases are gated contrast-enhanced cardiac CT cases; directly acquired and interpreted or drawn from a case library or other teaching resource; and
   c) At least 150 cases include a non-contrast CT for calcium scoring; and
   d) At least 50 cases are coronary CTA studies with correlation to invasive angiography. These may be acquired by the trainee or read from a case library. However, for cases obtained from a library, the original CTA dataset should be reviewed (not just pre-prepared 3D reconstructions) as well as the invasive angiography. The majority of cases from the library should be abnormal.
3. Shall provide a letter from the preceptor, attesting to competence in CCT; and
4. Shall continue in active CCT practice and participate in continuing professional development and quality assurance of CCT in order to remain competent.

3.8.3 **Grandfathering:**

Radiologists and Cardiologists who practiced CCT prior to (a date which is 3 months after final approval of these standards) are eligible for approval in CCT by the College if they provide satisfactory evidence of active practice:

1. For **Level 2** approval: interpreting a minimum of 50 CCT cases of which a minimum of 25 coronary CTA studies involved the applicant in acquiring, reconstructing, interpreting and reporting the case on real patients (not merely research subjects) for whom an official report is subsequently placed on the permanent medical file; or
2. For **Level 3** approval: interpreting a minimum of 100 CCT cases of which a minimum of 50 coronary CTA studies involved the applicant in acquiring, reconstructing, interpreting and reporting the case on real patients (not merely research subjects) for whom an official report is subsequently placed on the permanent medical file.
3. For approval to interpret Coronary Calcium Scoring only: acceptable evidence to the College of having been substantially engaged in such scoring prior to the implementation of these standards.
### 4.0 Definitions:

**Point of Care Ultrasound (POCUS)** can be an invaluable ultrasound examination provided in various settings and/or facilities at the point of care. The intent of the study is to clarify uncertain findings of the physical exam, identify important conditions in the context of acute care of the unwell patient, or provide image guidance that improves the success and safety of procedures in the acute care setting, particularly when time saving for diagnosis or treatment is critical. POCUS evaluations are limited to the scope of exam types included in the training of those individuals performing the exam. If a POCUS provider extends scanning beyond the scope of their usual practice pattern, education and experience, the likelihood of medical misadventure may cause a potential detrimental effect on diagnosis, treatment and patient care and is therefore to be avoided. Patients on whom POCUS is performed should be informed of the limited scope of a POCUS examination, and be advised that a POCUS exam does not compare to, or replace a consultative diagnostic examination.

**Consultative Diagnostic Ultrasound** aims to systematically map out normal and disordered anatomy, assess function and dysfunction in the body and/or provide guidance for a wide range of interventional procedures. Necessary components for a consultative sonographic exam include: 1) a professional mastery of the imaging technology (as evidenced by Ultrasound Modality approval by the College), 2) a systematic approach that results in a thorough diagnostic imaging assessment of the patient to include image recording, and 3) an interpretation of the exam provided in a well-documented and recorded report of the findings and conclusions – all performed in a College accredited facility. There is robust quality control and assurance around image recording, retention, disaster and backup recovery, report generation, transcription, physician report validation, report audits, equipment preventative maintenance, and confirmation of appropriate regulatory body sonologist credentialing and approvals.

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<tr>
<th><strong>Point of Care Ultrasound</strong> (CPSA Bylaws)</th>
<th><strong>Consultative Diagnostic Ultrasound</strong></th>
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