CERTIFICATE PROGRAM

CT THERAPY CERTIFICATE

for the
RADIATION THERAPIST

CAMRT ACTRM

CANDIDATE HANDBOOK

2025

Tel: 1-800-463-9729 or (613) 234-0012
http://www.camrt.ca/

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Introduction

Improvements in digital technology have allowed for the use of CT in the practice of radiation therapy to more accurately plan and individualize treatment for each patient. Use of CT has allowed for more accurate treatment simulation, treatment planning and treatment delivery.

The success of cancer treatment is dependent upon the accuracy and the quality of the design and delivery of the radiation beam. Use of CT improves targeting of the cancer and the avoidance of unnecessary irradiation to normal tissue, and organs at risk.

This certificate program discusses the recognition of anatomical structures on CT, the appearance of oncologic presentations and adapting scan parameters to optimize imaging.

Candidates who successfully complete the didactic and clinical components from CAMRT are eligible to receive a CT Therapy Certificate (CTRT) in and can use the designation "CTRT".

Individuals with questions about the CT Therapy Certificate are encouraged to contact us. Email is preferred for the quickest service.

CAMRT
Tel: 1-800-463-9729 or (613) 234-0012
Email: specialtycertificates@camrt.ca.
Web site: ***www.camrt.ca***

Purpose of the Program

The intent of the CT Therapy Certificate (CTRT) is to provide a mechanism for radiation therapists to demonstrate knowledge and competence in the field of CTSIM, to promote standards of excellence within this clinical area, and to identify those who have met a nationally recognized standard.

This certificate is intended to:

- be dynamic and progressive in nature
- address the current and future challenges in CT Imaging
- provide a Canadian credential that is sought by qualified radiation therapists
- provide a Canadian credential that is advocated by employers
- provide an opportunity for continuing professional development for continuing competence
- enhance safe and effective practice as described by the *CAMRT Member Code of Ethics and Professional Conduct– see https://www.camrt.ca/mrt-profession/professional-resources/code-of-ethics/.*

Program Eligibility

The CAMRT CT Therapy Certificate program is available to:

- Radiation therapists who have been certified by the CAMRT
- Internationally educated medical radiation technologists (IEMRTs) in the specialty of radiation therapy who are graduates of medical radiation technology programs similar to Canadian accredited programs
    - Documentation required from IEMRTs*
        - **Original letter** from entry-level education program verifying length of program to include both didactic and clinical components of the program.
        - **Notarized copy** of diploma/degree/certificate from entry-level education program.
        - **Letter of Attestation – APPENDIX A**

Required documentation not received within 30 days of program registration will result in a program cancellation/partial refund. **CAMRT strongly recommends candidates obtain required documentation prior to program registration and send it electronically in a SINGLE SCAN or PDF within the required timeframe to CPD@camrt.ca or specialtycertificates@camrt.ca. Candidates may begin working on the Summary of Clinical Competence only upon confirmation and approval of received documentation from CAMRT.*

Contact specialtycertificates@camrt.ca for further information.

Program Registration

Registration for the CTRT is done through the CAMRT website.

The prerequisite for this Certificate Program is the successful completion or Prior Learning Assessment and Recognition* (PLAR) of CAMRT's CT Imaging (CTI) 1 exam or first eligible course from the CT series. A minimum exam mark of 75% is required.

The Summary of Clinical Competence (SCC) for the CTRT program will be made available in the candidate's personal profile on the CAMRT website at the time of program confirmation. **Competencies performed before program registration will not be considered for this program.**

Required documentation for IEMRTs not received within 30 days of program registration will result in a program cancellation/partial refund.

See APPENDIX B for PLAR eligibility criteria

Program Overview

The CTRT program has both didactic/coursework and clinical components. The program has both didactic and clinical components. You must register in each course individually (didactic components) *and* into the certificate program to access the Summary of Clinical Competence (clinical component) after meeting any prerequisite requirements.

The CTRT program must be completed within five years of successful completion of the first eligible CT course in the series.

All components must be completed within the five-year timeframe.

To ensure consistency in clinical experience, the candidate must practice in CT SIM at least 16 weeks (80 full time shifts) within any 18-month block within the five-year timeframe. This clinical experience may only be acquired as a certified radiation therapist.

After review and approval of all components by the CTIC Committee, the ***CT Therapy Certificate*** is granted to the therapist. The credential granted is ***CTRT***.

It is the intent that those who earn the CTRT credential will continue their professional development. Ongoing continuing education is recommended to remain current in the dynamic field of CT Imaging.

NOTE: CAMRT both advises and expects that the candidate will hold sufficient personal liability coverage and any other employer required insurance coverage (ex: WSIB, AD & D) and receive the required permissions needed to complete the clinical requirements as outlined in the SCC. It is the candidate's responsibility to ensure they have the appropriate insurance coverage and permissions from their employer to complete this certificate program.

CTRT Program Overview	
Certificate Components	Didactic (coursework) Requirement • CT Imaging 1 (prerequisite) • CT Imaging 2 - Radiation Therapy • CT Imaging 3 – Radiation Therapy • Quick Self Study (1 of 4 choices). • 75% or higher on final exam/quiz is required.
	Clinical (competencies) Requirement • Verification of Experience • A Summary of Clinical Competence (SCC)
Timelines	Candidates have 5 years from the date of completion of their first eligible pre-requisite course to complete all remaining requirements of this certificate program.
	The Verification of Experience is part of the SCC, and it is signed by your supervisor/manager before or during the completion of your clinical competencies. This is not a prior experience pre-requisite form. The candidate must practice in CT Simulation for at least 16 weeks (or 80 full time shifts) within an 18-month block within the five-year timeframe of the certificate program. This clinical experience may only be acquired as a certified radiation therapist.
	Once registered in the certificate program, the candidate may begin working on their SCC and complete the competencies under supervision.
	(1) Required Quick Self Study must be completed before or during the CTRT program, but must be no more than 5 years old at the time of the Summary of Clinical Competence (SCC) submission.
SCC SUBMISSION IS THE FINAL STEP OF YOUR CTRT	

Didactic Component

The didactic component consists of:

- CAMRT CT Imaging 1 (or PLAR)*
- CAMRT CT Imaging 2 – Radiation Therapy**
- CAMRT CT Imaging 3 – Radiation Therapy
- (1) Quick Self Study from the following choices:
    - *Stereotactic Body Radiation Therapy*
    - *Respiratory Gating*
    - *Brachytherapy*
    - *Stereotactic Radiosurgery*
        - *Must be completed within the five years prior to the SCC submission*

Candidates must pass the courses and achieve a minimum score of **75%** on the final examinations*** of each didactic component to have them applied to the CT Therapy Certificate.

Candidates are allowed two rewrites within two years of their initial attempt on the CTI 1, CTI 2 - RT and CTI 3 - RT exams (if required). Candidates who fail the Discipline Specific Supplement must contact the CAMRT. A rewrite fee will apply.

Candidates who feel that they have the essential knowledge gained through relevant work experience and professional development may **challenge** the final exams in each of the three CT courses. A minimum mark of 75% must be achieved on each challenged exam. No rewrites are allowed for Challenge exams. Full course policies are shared upon registration.

If the candidate fails the challenge exam and wishes to continue in the program, they must take the required course.

See **APPENDIX C for PLAR criteria.*
***See **APPENDIX B** for course objectives.*
****See **APPENDIX D** for exam blueprints.*

Clinical Component

The **Summary of Clinical Competence (SCC)** is a list of procedures and associated competencies that must be assessed by a clinical advisor and/or delegated assessors. This represents the clinical component of the certificate program. **Only competencies performed *after* program registration will be accepted in the SCC.**

The clinical component is a clinical practicum that requires the candidate to practice in CT SIM with the following conditions:

- Practice under the supervision of an eligible Clinical Advisor (CA) with at least one per site.
- Complete the competencies listed in the SCC.
- Complete the CT Simulation experience requirement outlined in the SCC:
    - The candidate must practice in CT Simulation for at least 16 weeks (80 full time shifts) as a certified MRT in an 18-month block within the allowed 5-year timeframe of the certificate program,
    - This experience may predate registration into the certificate program, but may not predate completion of the first pre-requisite to the program,
    - This experience requirement is signed off on by the supervisor or manager of the site(s) at which the candidate completed their work experience.
    - Please ensure that you include a full start and end date (day, month, year) for the experience beginning and being achieved on the experience form.

The candidate is responsible for ensuring that all sections of the Summary are complete. A resubmission fee will apply for any incomplete submission, including any outstanding didactic requirements.

Dates and signatures must be full (no initials, please make the date, month and year clearly identifiable) and in "ink" (digital signatures are not accepted at this time).

Audits will be conducted at the Committee's discretion to ensure the proper process has been followed. Approximately 10% (or higher) of SCCs are audited per year.

Clinical Advisor

It is the candidate's responsibility to obtain a CA and site for the clinical component of the program. If multiple sites are used, a CA must be identified at each site. Please ensure that the CA completes all SCC introductory forms (contact information, checklist, roles and responsibilities form) once you register into the program to ensure the clinical advisor/delegated assessor is made aware of their role. Each Advisor is responsible for assigning their own Delegated Assessor (DA), if applicable and to ensure they have signed all forms and pages where these signatures appear. All signatures throughout the SCC must match. The following criteria also apply to international CAs for international candidates.

The Role of a Clinical Advisor (CA) can be found in APPENDIX D.

The clinical advisor must:

1. Be a radiation therapist with a CTRT credential **and/or a radiation therapist** with a minimum of 5 years' experience in the practice of CT SIM*
2. Be currently practicing in CT SIM
3. Not be currently registered in the CTRT Program
4. Identify others delegated to assess the candidate and ensure they are credentialed and competent in their practice
5. Perform the assessment on the candidate for all procedures/associated competencies or delegate assessment to another therapist or credentialed health care provider (such as a physicist, RN, BSc N or Medical Doctor)
6. Attest to the overall competency of the candidate by signing at the end of each Module.

Delegated Assessor(s)

It is the **Clinical Advisor's** responsibility to identify and assign a Delegated Assessor (DA) at their clinical site, if they wish to use one, and to ensure they are aware of their role. All professionals acting as delegated assessors must be identified on the Delegated Assessors Contact Information page in the SCC.

The delegated assessor must:

1. Be a radiation therapist with a CTRT credential **and/or** be a radiation therapist with a minimum of two years' experience in the practice of CT SIM
2. Be currently practicing in CT SIM
3. Not be currently registered in the CTRT Certificate program

The CA and/or DA will observe and assess each procedure/competency and sign/date the Summary of Clinical Competence (SCC) on the date the competency has been verified and confirmed.

The **module** sign-off and date must be completed by your CA and must represent the date by which all competencies have been verified and completed. You must retain a record (or have access to a record) of the completion of all mandatory competencies in case of audit.

**If this is not possible, please contact CAMRT.*

Clinical Advisors outside of Canada:

The following must be submitted within 30 days of program registration*:

- A **notarized** copy of the advisor's credentials (degree, diploma, or certificate)
- A copy of the ***Internationally Educated Medical Radiation Technologist Clinical Advisor Verification of Experience*** **form (See Appendix F)**. The hospital seal must be affixed to this form prior to submission.

All internationally educated clinical advisors must submit the *IEMRT Clinical Advisor Verification of Eligibility* Form.**

**Required documentation not received within 30 days of program registration will result in a program cancellation/partial refund.*

*****Including those who have the CTRT credential.***

CAMRT strongly recommends candidates obtain required documentation prior to program registration and send it electronically in a SINGLE SCAN or PDF within the required timeframe to CPD@camrt.ca or specialtycertificates@camrt.ca.

Candidates may begin working on the Summary of Clinical Competence only upon approval of received documentation from CAMRT.

Format of the Summary of Clinical Competence

You must retain a record (or have access to a record) of the completion of all mandatory competencies in case of audit. The following provides an overview of the requirements in the Summary of Clinical Competence:

- Demographic information
- CTRT Checklist
- Verification of practice in CT SIM
- Identification of the clinical advisor and delegates
- Guidelines for assessment of competency requirements
- List of procedures and associated competencies required, presented in the following modules.

Candidates must complete a minimum of 10 of the listed electives.
All electives (except for those in Module 8) must be performed clinically.

Module 1 Patient care (**All mandatory**)

- CPR (BLS or equivalent required) *
- Patient vital signs
- Patient Assessment
- Universal Precautions
- Exam indicators
- Verification of informed consent
- Patient transfer
- Monitor O_2

** The CPR must be Basic Life Support (BLS) level or higher, the Heart and Stroke and St. John's Ambulance BLS is most common; we can review an equivalent. The CPR should be valid throughout the completion of the SCC competencies and must be valid at the time of submission.*

Module 2 Contrast media administration (**All mandatory**)

- Evaluate lab results
- Contrast media selection
- Contrast media preparation
- Use of power injector
- Patient Monitoring

Module 3 Image manipulation and quality assurance

Five (5) Mandatory

- Measurement
- ROI
- Zoom
- Calibration
- Laser QA

Three (3) Elective

- CT Number
- Image Fusion
- Metal artifact reduction

Module 4 Head & neck procedures **Eleven (11) mandatory**

- Brain
- Nasopharynx
- Oral Cavity
- Thyroid
- Oropharynx
- Glottis
- Orbit
- Parotid
- Tonsil
- Palate
- Paranasal Sinus

One (1) Elective

- Stereotactic Radiosurgery

Module 5 Chest & breast procedures

Five (5) Mandatory

- Lung
- Esophagus
- Breast only
- Breast & nodes
- Respiratory Gating

Three (3) Elective

- Automated Breathing Control
- Prone Breast
- SBRT

Module 6 Abdomen & pelvis procedures

Six (6) Mandatory

- Prostate
- Bladder
- Rectum
- Endometrium\Cervix
- Miscellaneous Abdomen structures
- Anal Canal

Two (2) Electives

- Ovary
- Seminoma

Module 7 Sarcoma, lymphoma, pediatrics**, brachytherapy and palliative procedures

Seven (7) Mandatory

- Lymphoma – Above diaphragm
- Lymphoma – Below diaphragm
- Miscellaneous palliative
- Sarcoma
- Palliative Abdomen/Pelvis
- Palliative Lung
- Skin

Three (3) Electives

- Craniospinal
- Pediatrics*
- Brachytherapy

***For the purpose of the CTRT, a pediatric exam must include the use of adapted scan parameters that are specific to an infant, child or adolescent.*

Module 8 Other Modalities - perform and\or observe

All Electives

- Diagnostic CT
- SPECT CT
- PET CT
- CT Guided Intervention
- Note: For any observed competencies that are completed outside of your CA's or DA's clinical site, please have the site supervisor of the area, or whoever the candidate used to coordinate the sessions at that site, sign this area and provide contact information.

Candidates must complete a minimum of 10 of the listed electives. All electives (except for those in Module 8) must be performed clinically.

Competencies should not include any patient identifiers (health or exam number).

Proficiency for achievement of competency for this program is characterized as follows:

- When presented with situations, the MRT performs relevant competencies in a manner consistent with generally accepted standards and practices in the profession, independently, and within a reasonable timeframe. The MRT anticipates what outcomes to expect in a given situation, and responds appropriately, selecting and performing competencies in an informed manner.
- The MRT recognizes unusual, difficult to resolve and complex situations which may be beyond their capacity. The MRT takes appropriate and ethical steps to address these situations, which may include consulting with others, seeking supervision or mentorship, reviewing literature or documentation, or referring the situation to the appropriate healthcare professional.

Program Extension

Extensions beyond the five-year time frame are available under exceptional circumstances. Contact CAMRT **prior to your program expiration date** for information. Extensions are not guaranteed. You can view your program end date in your Portal.

There is a fee associated with extension requests.

Submission of Summary of Clinical Competence

Candidates must submit the completed Summary of Clinical Competence to the CAMRT for review and approval by the CT Imaging Committee. Electronic copies submitted as one file may be submitted to specialtycertificates@camrt.ca.

Incomplete Summary of Clinical Competence – Resubmission Fee

Any Summary of Clinical Competence deemed incomplete by a reviewer and returned for completion will be subject to resubmission fee. This also applies to any incomplete didactic requirement.

Continuing Professional Development

It is the intent that those who earn the CTRT credential will continue their professional development. Continuing education is recommended to remain current in the dynamic field of CT Imaging.

APPENDIX A

INTERNATIONALLY EDUCATED MEDICAL RADIATION TECHNOLOGISTS

CERTIFICATE PROGRAM REGISTRATION ATTESTATION STATEMENT

Included with this signed statement, is the required documentation to finalize my Certificate Program Application with the Canadian Association of Medical Radiation Technologists.

Candidate Name: _____

Certificate Program: _____

Title of Program Completed: _____

Name of Diploma/Degree: _____

Educational Institution for theoretical instruction: _____

Institution for Clinical Training: _____

Length of Total Program: Theoretical (months) [ ] **Clinical (months)** [ ]

By signing below, I verify that:

- ✓ All statements and documentation in this application are accurate. I understand that a false or misleading statement, omission or misrepresentation may compromise my registration request.
- ✓ The documentation attached regarding my education program and/or my clinical advisor is original and has not been modified in any way.
- ✓ I authorize CAMRT to contact any authority, institution, association, body or person in any jurisdiction to verify the statements in my application and related documents.
- ✓ I understand that I may be required to submit further information if required.

_____ _____

Signature of Applicant Date (month/day/year)

APPENDIX B

CT Imaging 1 Course Objectives

Chapter 1

Upon completion of this chapter, you should be able to:

- outline the process of CT.
- explain the role of Godfrey Hounsfield
- chart and break down the four basic steps to achieve a CT image.
- discuss the concept of digital processing.
- determine the role of applications and systems software.
- recognize the role of CT applications.
- explain the principle and role of mobile CT.
- explain the principle and role of CT fluoroscopy.
- explain the principle and role of dual source CT.
- explain the principle and role of CT simulation.
- explain the principle and role of CT in Nuclear Medicine.
- characterize the various acquisition components comprising a CT scanner.

Chapter 2

Upon completion of this chapter, you should be able to:

- recognize the principle and role of the localizer scan.
- evaluate and diagram the various types of multi-row detector systems.
- compare and contrast the two types of detector arrays.
- list the advantages of the higher slice scanners.
- discuss the principle and role of the data acquisition system.
- outline and evaluate the options available in a CT scan set-up.
- determine and demonstrate the optimal use of scan parameters.
- classify and characterize the four factors that affect radiation.
- explain and apply Beer's Law.
- explain and apply Euler's number.
- explain and apply the linear attenuation coefficient.
- solve for the linear attenuation coefficient given the number of photons involved.
- characterize the role of voxels and views in CT.
- explain and apply the concept of CT numbers.
- solve for the CT number given the linear attenuation coefficient of a tissue.

- solve for the linear attenuation coefficient given the CT number of a tissue.
- assess the role of the array processor.
- illustrate the concept of back-projection form of reconstruction.
- assess the role of filtered back projection.
- assess the role of adaptive statistical iterative reconstruction.

Chapter 3

Upon completion of this chapter, you should be able to:

- explain and demonstrate the concept of windowing.
- contrast and compare typical CT number ranges for various tissues.
- evaluate the role of image display software available.
- implement the various types of image display software available.
- analyse the role of the diagnostic imaging workstation.
- analyse the role of the CT simulator workstation.
- list the scanning restrictions for an MPR image.
- explain the concept of maximum intensity projection.
- explain the concept of three-dimensional imaging.
- explain the concept of isocentre marking and contouring for CT Simulation.
- characterize the placement of radiation treatment fields.
- assess the role of shielding in therapy.
- evaluate the role in therapy of fusion involving CT, MRI & PET images.

Chapter 4

Upon completion of this chapter, you should be able to:

- classify and illustrate temporal resolution.
- determine the factors that affect temporal resolution.
- classify and explain spatial resolution.
- determine the factors that affect spatial resolution.
- classify and explain contrast resolution.
- determine the factors that affect contrast resolution.
- classify and explain image noise.
- determine the factors that affect image noise.
- describe the concept of uniformity.
- describe the concept of linearity.
- recognize and explain patient–related artifacts.
- determine the factors that cause patient-related artifacts.

- recognize and explain equipment–related artifacts.
- determine the factors that cause equipment-related artifacts.
- develop and design a CT preventative maintenance program.
- evaluate current CT preventative maintenance program.
- evaluate the role of a Catphan phantom.
- know the guideline for laser QA for CT simulators.
- develop and design a CT quality assurance program.
- evaluate current CT quality assurance program.

Chapter 5

Upon completion of this chapter, you should be able to:

- compare dose expression quantities and measurements.
- determine contrast dose expression quantities and measurements.
- evaluate typical patient dose values.
- determine scanner design factors that affect patient dose.
- implement steps to reduce patient dose for each of these factors.
- determine operating parameter factors that affect patient dose.
- implement steps to reduce patient dose for each of these factors.
- determine patient factors that affect patient dose.
- implement steps to reduce patient dose for each of these factors.
- apply recommendations of dose reduction campaigns.
- evaluate current site radiation protection program.
- implement a program of radiation protection.

Chapter 6

Upon completion of this chapter, you should be able to:

- evaluate the role of patient screening.
- discuss the concept of consent and develop a consent form.
- evaluate the role of patient education regarding contrast media injection.
- apply tools to assess and monitor the patient for contrast medium injection.
- assess the risk of contrast-induced nephropathy.
- assess the patient for signs of adverse reactions.
- compare various types on contrast media available.
- apply measures to reduce the risk of contrast-induced nephropathy.
- evaluate current site IV injection program.
- implement an IV injection program.

- evaluate current site contrast media handling and administration.
- implement a contrast media handling and administration program.
- determine the factors that affect contrast enhancement and scan timing.
- implement steps to optimize contrast enhancement.

CT Imaging 2 – Radiation Therapy Course Objectives

Upon completion of this course, you will be able to:

- recognize most anatomical structures on any CT images of the chest, abdomen and pelvis
- differentiate between normal and abnormal structures in images of the chest, abdomen and pelvis
- recognize most anatomical structures on any CT images of Oncologic Emergencies
- recognize most anatomical structures on any CT images of Cutaneous Malignancies
- interpret the appearance of most common chest, abdomen and pelvis pathologies seen on CT scans
- interpret the appearance of most Oncologic presentations in the Breast, Gastro-Intestinal System, Genito-Urinary System, and Gynaecological System as seen on CT scans
- interpret the appearance of most Oncologic Emergency presentations as seen on CT scans
- interpret the appearance of most Cutaneous Malignancies as seen on CT scans
- adapt scan parameters to optimize imaging of chest, abdomen and pelvis for the Radiation Oncologist and CT planning
- adapt scan parameters to optimize imaging of Oncologic Emergencies for the Radiation Oncologist and CT planning
- adapt scan parameters to optimize imaging of Cutaneous Malignancies for the Radiation Oncologist and CT planning
- comment on appropriate patient positioning, use of immobilization, and bolus as required for CT Planning of the Breast, Gastro-Intestinal System, Genito-Urinary System, and Gynaecological System
- comment on appropriate patient positioning, use of immobilization, and bolus as required for CT Planning of Oncologic Emergencies, and Cutaneous Cancers.
- comment on the appropriate use of Contrast in CT Planning for the Breast, Gastro-Intestinal System, Genito-Urinary System, and Gynaecological System
- basic pathology is presented as a framework for many cancers, but will not be testable material except where it may influence how a patient is positioned or scanned

CT Imaging 3 – Radiation Therapy Course Objectives

Upon completion of this course, you will be able to:

- recognize most anatomical structures on any CT image of the central nervous system and orbit
- recognize the appearance of most common central nervous system and orbit pathologies seen on CT scans
- describe briefly the pathological process behind the most common pathologies seen on CT scans of the central nervous system and orbit
- discuss patient preparation, immobilization and image acquisition process for brain and craniospinal techniques
- describe a sample CT Simulator protocol for CNS/orbit
- recognize most common anatomical structures on any CT image of the head and neck
- recognize the appearance of most common head and neck pathologies seen on CT scans
- describe briefly the pathological process behind the most common pathologies seen on CT scans of the head and neck
- discuss patient preparation and immobilization for head and neck patients
- describe a sample CT Simulator protocol for head and neck
- recognize most anatomical structures on any CT image of the lung/chest
- recognize the appearance of most common lung/chest pathologies seen on CT scans
- describe briefly the pathological process behind the most common pathologies seen on CT scans of the lung/chest
- discuss patient preparation and immobilization for lung patients
- describe a sample CT Simulator protocol for lung/chest
- recognize most anatomical structures on any CT image of the upper and lower extremity
- recognize the appearance of most common sarcoma pathologies as seen on CT scans
- describe briefly the pathological process behind the most common sarcoma pathologies seen on CT scans
- recognize the appearance of most common non-oncologic related pathologies of upper and lower extremity as seen on CT scans
- describe briefly the pathological process behind the most common non-oncologic related pathologies seen on CT scans of the sinuses
- describe the use of radiation therapy in the treatment of sarcomas
- describe the challenges associated with CT Simulation process for sarcomas
- describe a sample CT Simulator protocol for upper extremity
- recognize most common lymphatics
- recognize lymphatic related pathology on CT scan
- describe the use of radiation therapy in treatment of lymphoma
- describe the special considerations required when CT simulating a lymphoma patient

- discuss metal artifact reduction software
- describe image fusion and how it is used in radiation therapy
- compare different respiratory gating methods
- describe immobilizations options for stereotactic body radiation therapy
- discuss CT Imaging in brachytherapy
- discuss the special considerations when CT simulating pediatric cases

Stereotactic Radiosurgery QSS– Learning Objectives

On completion of this quick self-study course, the learner will be able to:

- Understand the historical roots of Stereotactic Radiosurgery, and its ongoing developments
- Understand the rationale for using Radiosurgery (SRS and SRT) as a treatment modality
- Identify the systems available to deliver SRS or SRT treatments
- Demonstrate a basic understanding of simulation, planning and treatment procedures required to deliver SRS and SRT treatments
- Develop your own basic patient education guide for patients undergoing SRS or SRT treatments

SBRT QSS – Learning Objectives

On completion of this quick self-study course, the learner will be able to:

- Understand the basics of stereotactic body radiation therapy
- Know the importance of immobilization construction at simulation
- Understand motion management techniques that can be used for planning and treatment
- Learn about different treatment planning options – pros and cons
- Understand some quality assurance and verification needed specific to stereotactic body radiation therapy
- Understand treatment delivery and image guidance used for stereotactic radiation therapy
- See specific tumor sites that are treated with stereotactic body radiation therapy

Respiratory Gating QSS – Learning Objectives

On completion of this quick self-study course, the learner will be able to:

- Understand the basics of respiratory gating
- Learn different image acquisition techniques for motion management
- Know different techniques to limit respiratory motion
- Learn how respiratory motion affects treatment planning for different treatment techniques

- Understand some quality assurance and verification needed specific to respiratory gating techniques
- Understand delivery of respiratory gated treatment
- Learn the benefits of gating for specific tumor locations

Brachytherapy QSS – Learning Objectives

On completion of this quick self-study course the learner will be able to:

- Differentiate between low dose rate (LDR) and high dose rate (HDR) brachytherapy.
- Explain the rationale for using brachytherapy (BT) as a treatment modality.
- Determine the appropriate BT techniques for a given site.
- Identify the basic radiation protection requirements for a given treatment.
- Describe how the use of various imaging modalities is evolving in BT treatment.

APPENDIX C

Prior Learning Assessment and Recognition (PLAR) for CT Imaging 1 – ELIGIBILITY REQUIREMENTS

Non-refundable prior learning assessment and recognition fee:
$75 for members;
$150 for non-members.

Graduates from Canadian accredited radiological technology or nuclear medicine programs may be eligible for prior recognition of learning for CAMRT's CT Imaging 1. Prior learning (based on the criteria below) is considered equivalent to CAMRT's CT Imaging 1 and upon approval from CAMRT, candidates may proceed to the next course in the series. It is important to note that PLAR approval will trigger the 5-year timeline allowed for the CTIC program.

PLAR Eligibility requirements include:
1. Graduates from a Canadian accredited radiological technology or nuclear medicine programs*, **within 3 years of PLAR application**. Candidates will be required to select their program during the registration process.
**Whose applicable courses have been reviewed and approved by the CAMRT.*

See list of eligible programs and courses:
https://s3.us-east-1.amazonaws.com/fonteva-customer-media/00D1a000000KAr4EAG/apORJfBQ_School_list_PLAR_December_2022_pdf

2. Graduated from the accredited education program **within 3 years of PLAR application**. This timeline ensures currency in foundational knowledge.

3. Provide evidence, via OFFICIAL TRANSCRIPT**, of an overall 75% average (or greater) in all relevant didactic courses. Candidates must upload their transcript during the registration process.
***An official transcript is a complete and final representation of a student's academic record on school letterhead. It must bear the embossed seal, date issued and the Registrar's signature. A resubmission fee will apply for candidates submitting unofficial documents.*

Approval of the prior learning assessment and recognition for CT Imaging 1*** will trigger the candidate's CTIC 5-year timeline. This program start date will be automatically defaulted to the closest CAMRT exam date (May or November).
****or upon completion of any of the other CAMRT CT Imaging courses (whichever occurs first).*
For more information, please contact cpd@camrt.ca

APPENDIX D

CAMRT CT Imaging 1 Exam blueprint

Item presentation - % of question types	
Multiple Choice: 100% Label: 0% Short Answer 0%	
Exam structure	
Exam length: 2 hours and 15 minutes Number of questions: 100	
Exam delivery format	
On-line	
Course Content and question weighting	
Chapters	**Percentage weighting of number of questions/chapters**
1 – CT Principles and CT Physics	15-18%
2 – Data Acquisition and Image Reconstruction	15-18%
3 – Image Manipulation and Management	15-18%
4 – Quality Control and Quality Assurance	15-18%
5 – Radiation Dose, Patient Dose, and Protection	15-18%
6 – Contrast Media and Injection Techniques	15-18%

CAMRT CT Imaging 2 – Radiation Therapy Exam blueprint

Item presentation - % of question types	
Multiple Choice: 100%	
Exam structure	
Exam length: 2 hours and 15 minutes Number of questions: 100	
Exam delivery format	
On-line	
Course Content and question weighting	
Chapters	**Percentage weighting of number of questions/chapters**
General CT and Anatomy questions	23-27%
Breast	13-17%
Gastro-Intestinal	9-13%
Genito-Urinary	19-23%
Gynecological	5-9%
Skin	7-11%
Oncological Emergencies	10-14%

CAMRT CT Imaging 3 – Radiation Therapy Exam blueprint

Item presentation - % of question types	
Multiple Choice:	40%
True/False	25%
Label (multiple choice):	35%

Exam structure
Exam length: 2 hours and 15 minutes Number of questions: 100

Exam delivery format
On-line

Course Content and question weighting	
Chapters	**Percentage weighting of number of questions/chapters**
1 – CNS and orbits	16-20%
2 – Lung	16-20%
3 – Head and Neck	16-20%
4 – Sarcoma	6-10%
5 – Lymphoma	6-10%
6 – Special Cases	16-20%

APPENDIX E

The Role of a Clinical Advisor

To maintain the integrity of CAMRT Certificate programs, it is essential that all parties involved in the training and evaluation of certificate program candidates follow the procedures set out in the Program Handbook and Summary of Clinical Competence (SCC). A CAMRT Certificate indicates a level of competence above entry-to-practice that has been verified through the requirements of the program.

Clinical Advisor's responsibilities include:

- review the Program Handbook and SCC with the candidate.
- mentor and support candidates in their skill development
- assess firsthand competency/procedures performed by the candidate and verify competence by signing and dating each procedure in the SCC at the time competence is established and/or
- delegate assessment duties to individuals who have the expertise and qualifications outlined in the Program Handbook.
- ensure all delegated assessors have read the most current version of the Program Handbook and SCC. These documents are updated on an annual basis, so clinical advisors and delegated assessors must review the handbook and SCC with each new candidate.
- attest to overall competency by signing at the end of each module
- verify the overall competence of the candidate at the end of the clinical placement by signing the Declaration of Completion.

During clinical placements, the following criteria must be upheld:

All competencies must be **performed** independently by the candidate on a patient. A candidate cannot be deemed competent if they have only observed or simulated a procedure, unless otherwise indicated in the SCC.

The clinical advisor/delegated assessor must witness competent practice for a procedure/competency multiple times prior to the date of the final assessment. A signature in the SCC verifies that the technologist has **consistently shown** they have the knowledge, skill and judgement to be declared competent in each aspect of practice. It is recognized in some circumstances that procedures are not performed frequently; however, it is appreciated that there is a transference of skills between many procedures. ***It is the responsibility of the clinical advisor or delegated assessor to ensure this expected level of competence as evidenced by their signatures in the appropriate areas.***

If there are procedures in the SCC that are not performed at your clinical site it is the responsibility of the candidate to contact CAMRT to determine an alternate option (if any).

Detailed guidelines for assessment of competency are found in each module of the SCC. The guidelines listed provide an overview of the expectation for assessment by the clinical advisor or delegated assessor.

It is recognized being a clinical advisor or delegated assessor adds to your already heavy workload and responsibilities in your daily practice. The CAMRT appreciates your professionalism and commitment to help the candidate continue their education in an ever-changing healthcare environment.

APPENDIX F

Internationally Educated Medical Radiation Technologist
Clinical Advisor Verification of Experience

Hospital/Organization: _____

Name of Supervisor: _____
Supervisor Credential(s): _____

Supervisor Email: _____

NAME OF CTIC CANDIDATE: _____

To CAMRT Certificate Programs:

This is to confirm _____ (name of Clinical Advisor) is a current employee of the above noted hospital/organization.

The Clinical Advisor listed above is:

- A registered medical radiation technologist with a minimum of five years' experience in the practice of CT Imaging
- Currently practicing in CT

My signature below confirms the above meets the CAMRT's eligibility requirement to act in a Clinical Advisor (CA) role for the purpose of the CT Imaging Certificate (CTIC) program.

The affixed hospital seal confirms the authenticity of this submission.

_____ _____

Signature of Clinical Advisor Supervisor/Employer **Date**

APPENDIX G

Clinical Advisor (CA) Check List

To maintain the integrity of CAMRT Certificate programs, it is essential all parties involved in the training and evaluation of certificate program candidates follow the procedures set out in the Program Handbook and Summary of Clinical Competence (SCC). A CAMRT Certificate indicates a level of competence above entry-to-practice that has been verified through the requirements of the program.

As such, CAMRT must ensure all Clinical Advisors meet the same standards and are eligible to take on this assessment role.

This form must be submitted to the CAMRT along with the notarized documentation required for all internationally educated medical radiation technologists.

I, _____, acknowledge by my initials, the following to be true.

	I am a medical radiation technologist* with a CAMRT CTIC credential **OR**** a medical radiation technologist having a minimum of five years' experience in the practice of CT Imaging **or other:* _____
	I am **currently practicing** in CT.
	I am not currently registered in any of the CAMRT CT Certificate programs.
	I have no conflicts of interest* with the CTIC candidate. ***Conflicts of interest may include:** • Close personal relationships that could threaten independence or objectivity during assessments • Spouse or family member • A direct report (i.e. the assessor reports to the candidate)

I understand that any false or misleading statement, omission or misrepresentation may result in the candidate's automatic withdrawal from the program and/or revocation of the CTIC designation.

_____ _____

Clinical Advisor Signature Date