Radiation Therapy

1. Introduction

Candidates applying for certification and registration under the primary eligibility pathway are required to meet the Professional Education Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Radiation Therapy Didactic and Clinical Competency Requirements* are one component of the Professional Education Requirements.

The requirements are periodically updated based upon a practice analysis which is a systematic process to delineate the job responsibilities typically required of radiation therapists. The result of this process is a task inventory which is used to develop the clinical competency requirements (see section 4 below) and the content specifications which serve as the foundation for the didactic competency requirements (see section 3 below) and the examination.

2. Documentation of Compliance

To document that the Didactic and Clinical Competency Requirements have been satisfied by a candidate, the program director (and authorized faculty member if required) must sign the ENDORSEMENT SECTION of the *Application for Certification and Registration* included in the ~~*Certification and Registration*~~*Primary Eligibility Pathway Handbook*.

Candidates who complete their educational program during ~~2017~~ 2022 or ~~2018~~ 2023 may use either the ~~2014~~ 2017 Didactic and Clinical Competency Requirements or the ~~2017~~ 2022 requirements. Candidates who complete their educational program after December 31, ~~2018~~ 2023 must use the ~~2017~~ 2022 requirements.

3. Didactic Competency Requirements

The purpose of the didactic competency requirements is to verify that individuals had the opportunity to develop fundamental knowledge, integrate theory into practice and hone affective and critical thinking skills required to demonstrate professional competency. Candidates must successfully complete coursework addressing the topics listed in the ARRT Content Specifications for the Radiation Therapy examination. These topics would typically be covered in a nationally-recognized curricula such as the ASRT Radiation Therapy Curriculum. Educational programs accredited by a mechanism acceptable to ARRT generally offer education and experience beyond the minimum requirements specified ~~here~~in the content specifications and clinical competency documents.

4. Clinical Competency Requirements

The purpose of the clinical competency requirements is to verify that individuals certified and registered by the ARRT have demonstrated competency performing the clinical activities fundamental to a particular discipline. Competent performance of these fundamental activities, in conjunction with mastery of the knowledge and cognitive skills covered by the radiation therapy examination, provides the basis for the acquisition of the full range of procedures typically required in a variety of settings. Demonstration of clinical competence means that candidates have performed the procedures independently, consistently, and effectively during ~~the course of his or her~~their formal education. The following pages identify the specific procedures for the clinical competency requirements. Candidates may wish to use these pages, or their equivalent, to record completion of the requirements. The pages do NOT need to be sent to the ARRT.

4.1 General Performance Considerations

4.1.1 Patient Diversity

Demonstration of competence should include variations in patient characteristics such as age, gender, and medical condition.

4.1.2 Simulated ~~Versus Actual Patient~~ Performance

The ARRT requirements specify that certain clinical procedures may be simulated as designated in the specific requirements below. Simulations must meet the following criteria:

- The candidate must completely demonstrate skills as similar as circumstances permit to the ~~simulate the procedure on another person with the same level of~~ cognitive, psychomotor, and affective skills required for performing the procedures on ~~a~~ patients. ~~Examples of acceptable simulation include: demonstrating CPR on a mannequin; setting up another person for a treatment without actually activating the beam; and evaluating a related portal image from a teaching file;~~
- The program director must be confident that the skills required to competently perform the simulated task will ~~generalize or~~ transfer to the clinical setting, and, if applicable, the candidate must evaluate related images.

Examples of acceptable simulation include demonstrating CPR on a mannequin, setting up another person for a treatment without activating the beam, and evaluating a related portal image from a teaching file.

4.1.3 Elements of Competence

Demonstration of clinical competence requires that the program director or the program director's designee has observed the candidate performing the procedure independently, consistently, and effectively during the candidate's formal educational program. The exception is for procedures categorized as "participatory" as explained in 4.2.6.

4.1.4 Scope of Competence Assessment

The following is intended to offer a general guide to competence assessment in each of the three domains. It is recognized that most activities fall into more than one domain.

- Cognitive Domain: As part of providing treatment, candidates should demonstrate their understanding of concepts related to anatomy, physiology, pathology, and dose to critical structures. Candidates should also recognize complications and side-effects commonly associated with each treatment procedure. If facilities have a limited number of treatment options, candidates should also describe alternative treatment procedures (e.g., IMRT, IGRT, stereotactic) and explain how those procedures might apply to a given case.
- Psychomotor Domain: Candidates should demonstrate competence performing activities such as verifying treatment parameters, setting-up the treatment unit, positioning the patient, monitoring the patient during treatment delivery, and documenting treatment delivery.
- Interpersonal Domain: Candidates should demonstrate ongoing sensitivity to and compassion for each patient's physical and emotional well-being, interact with members of the radiation therapy treatment team in a positive and productive manner, and maintain high ethical standards.

The duration of clinical training may not allow students to follow patients over the entire course of treatment. However, some provision should be made to permit candidates to interact with at

least one patient and monitor the patient's progress over the continuum of their treatment planning and delivery.

4.2 Radiation Therapy Specific Requirements

4.2.1 General Patient Care

Candidates must be CPR certified and demonstrate competence in the remaining six patient care activities. The activities should be performed on patients whenever possible, but procedures may be demonstrated in a clinical lab environment if state or institutional regulations prohibit candidates from performing the procedures on patients.

4.2.2 Quality Control Procedures

Candidates must demonstrate competence in ~~three~~ five quality control activities.

4.2.3 Simulation Procedures

Candidates must demonstrate competence in seven treatment simulation ~~anatomic regions~~procedures. It is expected that the candidate will participate with appropriate personnel at the following levels of responsibility: perform, discuss, and review (level of participation may depend on state or institutional requirements). All simulation procedures must be demonstrated on patients and reviewed with appropriate personnel.

Demonstration of competence includes considerations related to radiation safety, equipment operation, patient and equipment monitoring, patient positioning and marking, treatment volume localization, imaging procedures, record keeping, and patient management and education.

4.2.4 Dosimetry

Candidates must demonstrate competence calculating doses for six treatment plans. Calculations should be performed for actual patients; however, calculations may be completed in a clinical lab exercise if demonstration on actual patients is not feasible.

4.2.5 Treatment Accessory Devices

Candidates must demonstrate competence in fabricating four devices.

4.2.6 Participatory Procedures

Candidates must participate in ~~three~~ four procedures that may be infrequent yet critical. Participation means that the candidate takes an active role in the procedure and understands the critical concepts vital to the success of the procedure. Participation may be performed in a clinical lab exercise if necessary.

4.2.7 Radiation Treatment Procedures

Candidates must demonstrate competence in ~~18~~ 16 radiation treatment procedures. ~~Fifteen~~ Fourteen procedures must be demonstrated on patients. ~~Three~~ Two procedures may be demonstrated in a clinical lab environment. Demonstration of competence does not require actual delivery of treatment dose. Demonstration of competence includes considerations related to radiation safety, equipment operation, patient and equipment monitoring, patient positioning, treatment volume localization, dose to critical structures, image acquisition and registration (e.g., MV, kV, CBCT), dose verification, record keeping, and patient management and education.

General Patient Care Procedures	Date Completed	Competence Verified By
CPR Certified		
Vital Signs – Blood Pressure		
Vital Signs – Pulse		
Vital Signs – Respiration		
Vital Signs – Temperature		
O_2 Administration		
Patient Transfer		
Quality Control Procedures		
Linear Accelerator		
Laser Alignment		
Imaging Systems		
Beam Output and Symmetry		
Simulator		
Laser Alignment		
QC Water Phantom (e.g., CT Number)		
Simulation Procedures		
Brain		
Head and Neck		
Thorax		
Breast		
Pelvis		
Skeletal		
Special Procedure (e.g., 4D CT, SBRT, Gating, Brachytherapy)		
Dosimetry		
Single Field		
Parallel Opposed Fields		
Weighted Fields		
Wedged Fields		
Computer Generated Isodose Plan		
Electron Field		
Treatment Accessory Devices		
Custom Block (Photon or Electron)		
Custom Bolus		
Custom Immobilization Devices ~~for Thorax or Abdomen/Pelvis~~ (e.g., Foaming Agents, Vacuum Bags)		
Thermoplastic Mold		
Participatory Procedures		
Total Body Irradiation (TBI)		
Craniospinal		
Brachytherapy		

SBRT/SRS		

Radiation Treatment Procedures	Date Completed	Patient or Simulated	Competence Verified By
Brain			
Primary			
Metastatic			
Head and Neck			
Multi-field			
Thorax			
Multi-field (non-IMRT)			
IMRT and/or Volumetric arc therapy			
Breast			
Tangents Only			
Tangents with Supraclavicular			
Tangents with Supraclavicular and Posterior Axilla Boost			
Special Set-up (e.g., Photon or Electron Boost, Prone, IMRT, Gating)			
Abdomen*			
Multi-field ~~(non-IMRT)~~			
Pelvis*			
Multi-field Supine			
Multi-field Prone			
Skeletal			
Multi-field Spine			
Extremity			
Electron Fields			
Single			
Photon or Electron			
Abutting Fields			

Multi-field includes two or more fields, and may include 3D conformal, IMRT and/or volumetric arc therapy (unless specified otherwise). *~~Abdomen and~~ Pelvis does not include treatments for metastatic disease.