



# Radiation Therapy

## 1. Introduction

Candidates for certification and registration 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 Handbook*.

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

## 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 cognitive knowledge and 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 the candidate has performed the procedure independently, consistently, and effectively during the course of his or her 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 simulate the procedure on another person with the same level of cognitive, psychomotor, and affective skills required for performing the procedure on a patient. 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.

### **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 course of 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 actually 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 quality control activities.

### **4.2.3 Simulation Procedures**

Candidates must demonstrate competence in treatment simulation for seven anatomic regions. 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 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 radiation treatment procedures. Fifteen procedures must be demonstrated on patients. Three 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.



<b>General Patient Care Procedures</b>	<b>Date Completed</b>	<b>Competence Verified By</b>
CPR Certified		
Vital Signs – Blood Pressure		
Vital Signs – Pulse		
Vital Signs – Respiration		
Vital Signs – Temperature		
O <sub>2</sub> Administration		
Patient Transfer		
<b>Quality Control Procedures</b>		
<b>Linear Accelerator</b>		
Laser Alignment		
Beam Output and Symmetry		
<b>Simulator</b>		
Laser Alignment		
<b>Simulation Procedures</b>		
Brain		
Head and Neck		
Thorax		
Breast		
Abdomen		
Pelvis		
Skeletal		
<b>Dosimetry</b>		
Single Field		
Parallel Opposed Fields		
Weighted Fields		
Wedged Fields		
Computer Generated Isodose Plan		
Electron Field		
<b>Treatment Accessory Devices</b>		
Custom Block (Photon or Electron)		
Custom Bolus		
Custom Immobilization Devices for Thorax or Abdomen/Pelvis (e.g., Foaming Agents, Vacuum Bags)		
Thermoplastic Mold		
<b>Participatory Procedures</b>		
Total Body Irradiation (TBI)		
Craniospinal		
Brachytherapy		



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

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