Radiation Therapy

Certification and registration requirements for radiation therapy are based on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists (ARRT) staff and the Radiation Therapy Practice Analysis and Continuing Qualifications Requirements (CQR) Advisory Committee. The purpose of the practice analysis is to identify job responsibilities typically required of radiation therapists at entry into the profession. The results of the practice analysis are reflected in this document. The purpose of the task inventory is to list or delineate those responsibilities. The attached task inventory is the foundation for both the clinical requirements and content specifications.

Basis of Task Inventory

In 2020, the ARRT surveyed a large national sample of radiation therapists to identify their responsibilities. When evaluating survey results, the advisory committee applied a 40%.criterion. That is, to be included on the task inventory an activity must have been the performed by at least 40% of therapists. The advisory committee could include an activity that did not meet the 40% criterion if there was a compelling rationale to do so (e.g., a task that falls below the 40% criterion but is expected to rise above the 40% criterion in the near future).

Application to Clinical Requirements

The purpose of the clinical requirements is to verify that candidates have completed a subset of the clinical procedures within a modality. Successful performance of these fundamental procedures, in combination with mastery of the cognitive knowledge and skills covered by the ARRT certification and registration examination, provide the basis for the acquisition of the full range of clinical skills required in a variety of settings. An activity must appear on the task inventory to be considered for inclusion in the clinical requirements. For an activity to be on the clinical requirements, survey results had to indicate that therapists performed that activity. The clinical requirements are available from ARRT's website (www.arrt.org).

Application to Content Specifications

The purpose of the ARRT Radiation Therapy examination is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of radiation therapists at entry into the profession. The content specifications identify the knowledge areas underlying performance of the tasks on the task inventory. Every content area can be linked to one or more activities on the task inventory. Note that each activity on the task inventory is followed by a content category that identifies the section of the content specifications corresponding to that activity. The content specifications are available from ARRT's website (www.arrt.org).

Activity		Content Categories Legend: PC = Patient Care, S = Safety, P = Procedures
1.	Wear a radiation monitoring device while on duty.	S.2.B.3.
2.	Review personal radiation exposure records.	S.2.
3.	Practice appropriate measures to minimize unnecessary radiation exposure to the patient.	S.2.
4.	Practice appropriate precautions to minimize occupational radiation exposure (e.g., ALARA).	S.2.B.
5.	Restrict access to the control area.	S.2.C.
6.	Demonstrate and promote professional and ethical behavior (e.g., confidentiality, regulation compliance).	PC.1.A.
7.	Manage interpersonal interactions in an effective manner.	PC.1.B.
8.	Review the treatment or procedure to verify information is accurate, appropriate, and complete (e.g., patient history, clinical diagnosis, physician's orders).	PC.1.G., PC.2.C.
9.	Enter pertinent patient demographic data into simulation/treatment planning software.	PC.2.C.
10.	Ensure that all diagnostic studies and pertinent medical records are available prior to simulation.	PC.2.A.
11.	Consult with radiation oncologist before simulation.	P.2.
12.	Review patient's record for previous or pending treatments/procedures (e.g., chemotherapy, transfusions, surgery, radiation therapy).	PC.2.A.
13.	Verify the patient's identity.	PC.1.A.2.A.
14.	Provide for the patient's safety, comfort, and modesty.	PC.1.A.1.C.
15.	Assess and follow department's policy regarding patient's clinical condition.	PC.2.B.
16.	Assess patient's ambulatory condition and provide assistance as necessary.	PC.1.C.
17.	Utilize proper technique during patient transfer.	PC.1.C.1.
18.	Use proper body mechanics and/or ergonomic devices to promote personnel safety.	PC.1.C.
19.	Obtain vital signs.	PC.1.C.3.A.
20.	Recognize and communicate the need for prompt medical attention.	PC.1.D., PC.1.G.3.
21.	Provide emergency care.	PC.1.D.

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22.	Follow environmental protection standards for handling and disposing of hazardous materials (e.g., disinfectants, chemotherapy IV, radioactive implant).	PC.1.F., S.2.E.
23.	Follow environmental protection standards for handling and disposing of bio-hazardous materials (e.g., sharps, blood, body fluids).	PC.1.E.3.D.
24.	Follow appropriate procedures when caring for patients with communicable diseases.	PC.1.E.
25.	Clean and disinfect or sterilize facilities and equipment.	PC.1.E.
26.	Practice standard precautions.	PC.1.E.3.
27.	Use sterile or aseptic technique when indicated.	PC.1.E.2.
28.	Monitor the patient's auxiliary medical equipment (e.g., IVs, catheters) during treatment or procedures.	PC.1.C.2.
29.	Maintain oxygen administration as prescribed.	PC.1.C.2.B.
30.	Verify informed consent as necessary.	PC.1.A.1.A.
31.	Obtain pertinent medical history.	PC.1.G., PC.2.A.
32.	Explain the procedure in a way which is appropriate to the patient's level of understanding.	PC.1.B.
33.	Evaluate the patient's ability to understand and comply with requirements for the requested treatment or procedure.	PC.1.B.
34.	Explain treatment or procedure instructions to the patient, patient's family, or authorized representative (e.g., scheduling delays, treatment duration).	PC.1.B.
35.	Prior to administration of a contrast agent, determine if the patient is at risk for an adverse event.	PC.1.G.
36.	Prior to administration of a contrast agent, review pertinent information to prepare appropriate type and dosage.	PC.1.G.
37.	Administer contrast agents as required by the procedure.	PC.1.G.2.
38.	Assess the patient after administration of a contrast agent to detect adverse reactions.	PC.1.G.3.
39.	Recognize abnormal or missing lab values relative to the treatment or procedure ordered.	PC.1.G.2., PC.2.B.2.
40.	Utilize knowledge of disease to simulate treatment fields.	P.1., P.2.
41.	Ensure removal of materials that could interfere with imaging, treatment, or safety of the patient.	S.2.A., P.2.4.
42.	Screen patients for ferrous and radiofrequency sensitive materials (e.g., aneurysm clips, pacemaker) prior to entering MRI magnetic field.	S.2.D.

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43.	Use positioning aids, as needed, to reduce patient movement and/or promote patient safety.	S.2.A.4., P.2.A.4.
44.	Fabricate individualized immobilization devices.	S.2.A.4., P.2.A.4.
45.	Position patient on simulator table using positioning aids and immobilization devices.	P.4.C.1.
46.	Utilize programmable lasers at simulation.	P.2.B.5.
47.	Explain breathing instructions prior to procedure.	PC.1.B.3.
48.	Select factors to obtain optimal images.	S.2.A.1., P.2.B.1.
49.	Acquire an appropriate and complete CT volume for treatment planning according to physician order.	P.2.B.
50.	Establish reference point(s) within the CT data set (e.g., isocenter, origin).	P.2.
51.	Mark treatment fields and set-up points on patient (e.g., permanent or temporary reference marks, fiducial markers).	P.2.
52.	Instruct the patient on maintenance of treatment reference marks.	PC.1.B.3.D.
53.	Record/verify simulation parameters.	P.2.C.
54.	Document patient positioning instructions in treatment record.	P.2.C.
55.	Review simulation images with radiation oncologist for approval or modification.	P.2.C.
56.	Review the isodose plan, imaging order, and treatment prescription prior to implementation.	P.4.B.
57.	Enter parameters used to calculate monitor units for a prescribed treatment.	P.3.
58.	Calculate the number of monitor units for a prescribed treatment.	P.3.C.
59.	Enter parameters used to calculate monitor units for a prescribed treatment in an emergent situation.	P.3.
60.	Create and label custom beam shaping devices (e.g., electron blocks, bolus).	P.4.D.1.
61.	Perform clinical treatment setup (e.g., en face electrons, whole brain).	P.3., P.4.B.
62.	Verify the treatment plan is consistent with the prescription and can be accurately implemented in the treatment room.	P.4.B., P.4.E.
63.	Review patient’s treatment record for completeness and accuracy.	P.4.B., P.4.E.
64.	Review treatment record and parameters prior to each treatment delivery.	P.4.B.

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65.	Verify treatment fields by acquiring images.	P.4.E.3.
66.	Label simulation and treatment photos appropriately.	P.2.C., P.4.E.
67.	Verify accuracy of custom beam shape prior to treatment.	P.4.D.
68.	Review images for approval or field modification and initiate changes as required.	P.4.B.6.
69.	Document changes in prescribed course of treatment (e.g., treatment breaks, isocenter shifts, beam modifications).	P.4.B.
70.	Communicate relevant information to appropriate stakeholders (e.g., health care providers, ancillary staff).	PC.1.B., PC.2.
71.	Schedule the patient based on prescribed treatment plan.	P.4.B.
72.	Communicate schedule delays to the patient.	PC.1.B.
73.	Respond as appropriate to treatment or procedure inquiries from the patient, patient's family, or authorized representative (e.g., scheduling changes, procedure duration, other treatment modalities).	PC.1.B.
74.	Explain and confirm the patient's preparation (e.g., diet restrictions, preparatory medications, bladder filling) prior to treatment or procedure.	PC.1.B.3.
75.	Instruct the patient regarding appropriate nutrition during course of treatment and refer the patient to appropriate personnel as required.	PC.1.B.3., PC.2.B.3.
76.	Instruct the patient concerning proper skin care of treatment area(s).	PC.1.B.3.
77.	Inspect treatment area/accessory devices for any unsafe conditions and report findings if necessary.	S.2.C., P.3., P.4.D.
78.	Position the patient, treatment machine, and accessory equipment according to the approved treatment plan.	P.4.B.
79.	Perform and document shifts according to the approved treatment plan.	P.4.B.2.
80.	Record/verify treatment machine parameters.	P.4.E.2.
81.	Utilize beam modification devices according to the treatment plan.	P.4.D.
82.	Perform pre-treatment equipment clearance check on applicable treatment plans (e.g., dry run in the treatment room).	P.4.
83.	Deliver treatment by setting and activating controls on a linear accelerator console.	P.4.C.2.H.

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84.	Monitor the patient visually and audibly during treatment or procedure.	P.4.E.1.
85.	Notify appropriate personnel of adverse events or incidents (e.g., patient fall, wrong patient treated).	PC.2.C.2.
86.	Recognize any side effects or treatment-related problems and take appropriate action.	S.1.C., S.1.D.
87.	Verify the documentation of treatment delivery in the patient record.	PC.2.C., P.3.C.16., P.4.E.2.
88.	Identify and capture charges for billable devices and procedures.	PC.2.C.3.
89.	Document required information on the patient's medical record (e.g., treatment documentation)	PC.2.C., P.3.C.16., P.4.E.2.
90.	Participate in quality assurance discussions to review patient issues (e.g., history, diagnostic studies, disease stage, type of treatment).	PC.2., S.1.C., S.1.D.
91.	Perform daily warm-up procedures (e.g., CT simulator, treatment units) and document results.	S.2.H.
92.	Conduct routine quality assurance checks on imaging and treatment equipment and document results.	S.2.H.
93.	Monitor treatment equipment/software and report any malfunctions.	P.4.E.6.
94.	Troubleshoot and correct treatment equipment/software malfunctions, if appropriate.	P.4.E.6.B.
95.	Perform CT simulator quality assurance checks.	S.2.H.2.
96.	Identify abnormal quality assurance results and take appropriate action.	S.2.H.
97.	Complete/verify quality assurance checks on a treatment plan before initial treatment delivery.	S.2.H.
98.	Utilize image registration/image comparison software.	P.4.E.3.
99.	Utilize MV imaging.	P.4.B.6.C.
100.	Utilize kV imaging.	P.4.B.6.A.
101.	Administer intensity modulated radiation therapy (IMRT).	P.4.B.5.E.
102.	Utilize multileaf collimator (MLC).	P.4.D.1.D.
103.	Utilize respiratory gating protocols.	P.4.B.5.D.
104.	Utilize surface guided radiation therapy (SGRT)	P.4.C.1.D.
105.	Utilize enhanced dynamic wedge.	P.4.D.1.F.
106.	Utilize couch indexing capability.	P.4.C.1.A.

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107.	Utilize Six degrees of freedom treatment couch (e.g., HexaPOD™, PerfectPitch™)	P.4.C.2.G.
108.	Utilize record and verify system.	P.4.E.2.
109.	Utilize stereotactic delivery methods (SRS, SBRT).	P.4.B.5.G.
110.	Utilize custom electron block fabrication equipment.	P.4.D.1.C.
111.	Utilize diodes/thermoluminescent dosimeters (TLDs).	S.2.G., S.3.B.
112.	Utilize cone beam CT (CBCT).	P.4.B.6.B.
113.	Utilize Image Guided Radiation Therapy (IGRT).	P.4.B.6.
	Participate in the following procedures:	
114.	Brachytherapy	S.1.D.8.B.
115.	TBI (Total Body Irradiation)	P.1.A.8., P.4.
116.	TSE/TBE (Total Skin/Body Electrons)	P.1.A.8.D., P.4.
	Set up patient and treatment unit to personally perform the following radiation therapy treatments:	
117.	Brain: SRS	P.1.A.1., P.4.
118.	Brain: Primary	P.1.A.1., P.4.
119.	Brain: Metastatic (whole brain)	P.1.A.1., P.4.
120.	Brain: Craniospinal	P.1.A.1., P.4.
121.	Head and Neck: Laterals only	P.1.A.2., P.4.
122.	Head and Neck: 3D Conformal	P.1.A.2., P.4.
123.	Head and Neck: IMRT	P.1.A.2., P.4.
124.	Lung: AP/PA	P.1.A.4., P.4.
125.	Lung: 3D Conformal	P.1.A.4., P.4.
126.	Lung: IMRT	P.1.A.4., P.4.
127.	Lung: SBRT	P.1.A.4., P.4.
128.	Breast: Tangents only	P.1.A.3., P.4.
129.	Breast: Tangents with Supraclavicular	P.1.A.3., P.4.
130.	Breast: Tangents with Supraclavicular and Posterior Axilla	P.1.A.3., P.4.
131.	Breast: Tangents with Supraclavicular and Separate Internal Mammary	P.1.A.3., P.4.
132.	Breast: IMRT	P.1.A.3., P.4.
133.	Breast: Prone	P.1.A.3., P.4.
134.	Breast: Partial, 3D conformal	P.1.A.3., P.4.
135.	Abdomen: AP/PA	P.1.A.5., P.4.

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136.	Abdomen: 3D Conformal	P.1.A.5., P.4.
137.	Abdomen: Para-Aortic	P.1.A.5., P.4.
138.	Abdomen: IMRT	P.1.A.5., P.4.
139.	Abdomen: SBRT	P.1.A.5., P.4.
140.	Pelvis: AP/PA	P.1.A.5., P.1.A.6., P.4.
141.	Pelvis: 3D Conformal Supine	P.1.A.5., P.1.A.6., P.4.
142.	Pelvis: 3D Conformal Prone	P.1.A.5., P.1.A.6., P.4.
143.	Pelvis: Inguinal Lymph Nodes	P.1.A.5., P.1.A.6., P.4.
144.	Pelvis: IMRT	P.1.A.5., P.1.A.6., P.4.
145.	Pelvis: SBRT	P.1.A.5., P.1.A.6., P.4.
146.	Skeletal: 2D Spine	P.1.A.7., P.4.
147.	Skeletal: 3D Spine	P.1.A.7., P.4.
148.	Skeletal: IMRT Spine	P.1.A.7., P.4.
149.	Skeletal: SBRT Spine	P.1.A.7., P.4.
150.	Skeletal: Extremity	P.1.A.7., P.4.
151.	Electron Fields: Single	P.2., P.4.
152.	Abutting Fields	P.2., P.4.
153.	Heterotopic Treatment	P.1.A.8.H., P.4.