

### **Radiation Oncology Study Guide**

### Initial Certification Qualifying (Computer-Based) Exam

### **General and Radiation Oncology**

This exam is designed to assess your understanding of the entire field of oncology and radiation oncology. Included are questions on the following topics related to cancer and cancer therapies of every type, as well as appropriate benign entities:

- 1. Epidemiology and pathology
- 2. Normal and pathologic anatomy
- 3. Elements of cancer diagnosis, staging, treatment (including the utilization of modalities other than radiation), and follow-up
- 4. Tumor markers for diagnosis and follow-up
- 5. Natural history and routes of local, regional, and distant spread
- 6. Selection of treatment modality (specific details of multimodality therapies including sequencing, interactions, and specific agents)
- 7. Management of both local and metastatic disease
- 8. Optimum radiation simulation, field design, and radiation techniques (including external beam, radiosurgery, brachytherapy employing HDR and LDR sources, and unsealed radioactive agents) for various clinical situations
- 9. Tumor localization and respiratory management
- 10. Radiation target and organs at risk dose distribution
- 11. Selection of optimum radiation volume, dose, and fractionation
- 12. Radiation dose constraints
- 13. Interpreting a dose-volume histogram
- 14. Understanding of how radiation affects normal tissues
- 15. Side effects of radiation and other modalities, and how to manage them
- 16. Evidence-based treatment results (e.g., with surgery, radiation therapy, chemotherapy, biological therapy, or other emerging interventions)
- 17. Patterns of failure
- 18. Palliative care
- 19. Precision and errors in treatment planning
- 20. Quality assurance
- 21. Patient and personnel safety
- 22. Bioethics
- 23. Biostatistics

# **Categories for General and Radiation Oncology**

May include, but are not necessarily limited to:

Benign Diseases	2% to 5%
Breast	9% to 15%
Central Nervous System	5% to 11%
Gastrointestinal	9% to 15%
Genitourinary	9% to 15%
Gynecological	7% to 13%
Head and Neck	7% to 13%
Hematologic	5% to 11%
Lung and Mediastinum	9% to 15%
Non-Clinical Skills (NCS)	1% to 6%
Pediatric	4% to 10%
Sarcoma	2% to 8%
Skin Histologies	7% to 13%

The ranges above are those generally in effect for the exam to be administered in 2025 and are intended only for guidance in candidate preparation. They do not necessarily represent a precise number of scorable items.

## **Benign Diseases**

- 1. Keloid
- 2. Heterotopic Bone
- 3. Dupuytrens/Ledderhose disease
- 4. Osteoarthritis

- 5. Graves Ophthalmopathy
- 6. Other

#### **Breast**

- 1. Early-stage
- 2. Locally advanced
- 3. Inflammatory
- 4. Carcinoma in situ
- 5. Locally recurrent
- 6. Metastatic carcinoma

## **Central Nervous System**

- 1. Astrocytoma, low grade
- 2. Astrocytoma, high grade
- 3. Medulloblastoma
- 4. Brainstem glioma
- 5. Ependymoma and ependymoblastoma
- 6. Pineal
- 7. Lymphoma
- 8. Optic tract glioma
- 9. Oligodendroglioma
- 10. Meningioma (benign and malignant)
- 11. Pituitary
- 12. Spinal cord
- 13. Craniopharyngioma
- 14. Arteriovenous malformation (AVM)
- 15. Acoustic neuroma

### Gastrointestinal

- 1. Esophagus
- 2. Stomach
- 3. Small bowel

- 4. Colon/rectum
- 5. Anus
- 6. Pancreas
- 7. Biliary tract
- 8. Liver

# Genitourinary

- 1. Prostate
- 2. Bladder
- 3. Testes
- 4. Kidneys
- 5. Ureter
- 6. Urethra
- 7. Penis

# **Gynecological**

- 1. Cervix
- 2. Endometrium/uterus
- 3. Ovaries and fallopian tubes
- 4. Vagina/urethra
- 5. Vulva

# **Head and Neck**

- 1. Orbits/eye
- 2. Oral cavity
- 3. Lips
- 4. Nasal ala
- 5. Nasal cavity
- 6. Nasopharynx
- 7. Paranasal sinuses
- 8. Oropharynx
- 9. Hypopharynx

- 10. Larynx
- 11. Salivary glands (major and minor)
- 12. Thyroid gland

### Hematologic

- 1. Hodgkin lymphoma
- 2. Non-Hodgkin lymphoma
- 3. Leukemia, chronic and acute
- 4. Multiple myeloma/plasmacytoma
- 5. NK/T cell lymphoma
- 6. Cutaneous lymphomas

#### **Lung and Mediastinum**

- 1. Non-small cell
- 2. Small cell
- 3. Superior sulcus tumor
- 4. Thymomas, thymic, and/or other mediastinal tumors
- 5. Mesothelial/pleural tumors

Non-Clinical Skills A link to a detailed non-clinical skills syllabus has been provided for preparation of topics in this category: Non-Clinical Skills (NCS) Syllabus

### **Bioethics**

- 1. Consent in the impaired patient
- 2. HIPAA issues
- 3. Research issues
- 4. General consideration

## Patient and personnel radiation safety and source handling

- 1. Human factors related to error
- 2. Communication of error
- 3. Frequency/necessity of repeat calculations
- 4. General considerations

#### **Biostatistics**

- 1. Pvalue and significance
- 2. Risk ratio
- 3. True positive/negative
- 4. Meta-analysis
- 5. General considerations

## Quality assurance (QA)

- 1. Routine vs exceptional QA
- 2. QA after linac service
- 3. Value of peer review
- 4. Root cause analysis
- 5. General considerations

### Pediatric

- 1. Retinoblastoma
- 2. Wilms tumor
- 3. Neuroblastoma
- 4. Rhabdomyosarcoma
- 5. Lymphomas
- 6. Leukemias
- 7. Histocytosis X
- 8. Ewing sarcoma and other bone and cartilage tumors
- 9. Pediatric solid tumors
- 10. Soft-tissue sarcoma
- 11. Germ cell tumor
- 12. Hepatic tumor
- 13. Osteosarcoma
- 14. Hodgkin lymphoma
- 15. Medulloblastoma
- 16. Astrocytoma (glioma), low grade
- 17. Astrocytoma, high grade

- 18. Brain stem glioma
- 19. Ependymoma
- 20. Pineal/germ cell
- 21. Craniopharyngioma
- 22. Optic tract

### Sarcoma

- 1. Soft tissue sarcomas
- 2. Ewing sarcoma
- 3. Desmoid tumor
- 4. Osteosarcoma and/or chondrosarcoma
- 5. Other benign and malignant bone and joint tumors

# Skin Histologies

- 1. Basal
- 2. Squamous
- 3. Melanoma
- 4. Merkel