

Radiation Oncology MOC Study Guide

The following study guide is intended to give a general overview of the type of material that will be covered on the Radiation Oncology Maintenance of Certification (MOC) examination. Examples of the scope and level of questions that may appear on the examination are also provided. The purpose of the cognitive examination is to assess practical knowledge in radiation oncology, and the examination is intended to be geared toward the practicing general radiation oncologist. The distribution and content of the examination are as follows:

Clinical:

The clinical section comprises the bulk of the examination and is intended to cover all of the common clinical diseases treated by the practicing radiation oncologist. While the frequency of questions for a given clinical area may vary from exam to exam, the distribution of questions roughly reflects the scope of routine general radiation oncology practice.

NOTE: All questions related to contemporaneous staging of hypothetical patients should be answered using the most recent edition of the American Joint Commission on Cancer (AJCC) staging system (7th Ed., Jan. 2010). Staging related to previously reported studies should be answered using the staging system actually used in the report.

Pediatrics/Pediatrics Central Nervous System (CNS)

Gastrointestinal (GI)

Gynecology (GYN)

Genitourinary (GU)

Lymphoma/Leukemia

Head and Neck/Skin

Lung

Breast

Bone/Sarcoma

Central Nervous System (CNS)

The remainder of the exam will be composed of content related to the following three categories:

Physics:

Physics questions are intended to cover areas of physics knowledge, including quality assurance and safety, likely to be encountered in daily clinical practice.

Radiation Biology:

The radiation biology section is intended to cover the very basic principles of radiation biology and radiation safety upon which the practice of radiation oncology is based.

Biostatistics and Ethics:

Biostatistics and ethics questions cover the broad areas of statistics and ethics as they relate to the practice of radiation oncology.

Below are examples of the types of questions that may appear on the MOC cognitive exam. The scope and level of these sample questions roughly reflect that of exam questions. One sample question is provided for the physics and radiation biology category areas. Two samples are provided for each of the major clinical areas.

Physics

The depth in centimeters to which an electron beam provides effective coverage is roughly equivalent to which of the following?

- A. One-third the energy of the electrons
- B. One-half the energy of the electrons
- C. The total energy of the electrons
- D. Twice the energy of the electrons

Key = A

Radiation Biology

Increased tumor cell kill of relatively radiation-resistant hypoxic cells can be achieved by the concurrent administration of radiation and any of the following **EXCEPT**:

- A. Tirapazamin.
- B. Mitomycin.
- C. Misonidazole.
- D. Fluorouracil.
- E. Hyperbaric oxygen.

Key = D

Breast

According to the results of the National Surgical Adjuvant Breast and Bowel Project (NSABP)-06 trial, lumpectomy with radiation compared to lumpectomy alone results in higher rates of local control and which of the following?

- A. Higher overall survival rates.
- B. Equivalent overall survival rates.
- C. Higher rates of second malignancy.
- D. Lower rates of distant metastasis.

Key = B

In patients with lymph node involvement whose tumors overexpress ERBB2 (HER2/neu), which of the following drugs is routinely given as adjuvant therapy?

- A. Doxorubicin (Adriamycin)
- B. Cetuximab (C225, or Erbitux)
- C. Trastuzumab (Herceptin)
- D. Cyclophosphamide (Cytosan)
- E. Tamoxifen (Soltamox)

Key = C

Head and Neck

According to meta-analysis of randomized clinical trials, administration of chemotherapy in patients undergoing radiation treatment for squamous cell carcinoma of the head and neck is most effective when given in which of the following ways?

- A. In the adjuvant setting following radiation
- B. As induction prior to administration of radiation
- C. Concurrently with radiation
- D. Both as induction and concurrently with radiation

Key = C

For patients with early stage glottic cancer (T1N0), all of the following are acceptable fractionation schemes **EXCEPT**:

- A. 1.8 Gy Daily to 60- 63 Gy.
- B. 2 Gy daily to 64-66 Gy.
- C. 2.25 Gy daily to 56-63 Gy.
- D. 2.5 Gy daily to 50-55 Gy.

Key = A

Gastrointestinal (GI)

According to the Gastrointestinal Tumor Study Group (GITSG) postoperative randomized trial for pancreatic cancer, postoperative chemoradiation compared to surgery alone was associated with which of the following?

- A. No improvement in overall or disease-free survival
- B. An approximate doubling of median and two-year survival
- C. No improvement in survival but significant improvement in local control
- D. Five-year survival of more than 50 percent in the chemoradiation arms

Key = B

What is the appropriate AJCC staging for a rectal tumor that invades through the muscularis propria into the subserosa with 2 of 16 regional nodes removed?

- A. T1N1
- B. T2N1
- C. T2N2
- D. T3N1
- E. T4N1

Key = D

Gynecology (GYN)

For patients with clinical Stage III squamous cell carcinoma of the uterine cervix, what is the incidence of paraaortic lymph node metastasis on exploration?

- A. Less than 20%
- B. 21-30%
- C. 31-50%
- D. Greater than 51%

Key = C

Randomized trials evaluating chemotherapy in combination with radiation have demonstrated which of the following outcomes?

- A. No improvement in local control or survival with any form of chemotherapy
- B. Improved survival and local control with neoadjuvant chemotherapy followed by radiation
- C. Improved pelvic control but no improvement in overall or disease-free survival with chemotherapy
- D. Improved disease-free and overall survival with concurrent chemoradiation

Key = D

Lymphoma

Which of the following classifications of Hodgkin lymphoma has the most favorable prognosis?

- A. Lymphocyte predominant
- B. Nodular sclerosis
- C. Mixed cellularity
- D. Lymphocyte depletion

Key = A

All of the following drug combinations are used for the treatment of Hodgkin lymphoma

EXCEPT:

- A. ABVD
- B. MOPP/ABVD
- C. Stanford V
- D. ACT

Key = D

Genitourinary

All of the following isotopes are used for permanent prostate seed implants **EXCEPT:**

- A. Iodine-125
- B. Palladium-103
- C. Au-198
- D. Iridium-192

Key = D

Regarding radiation therapy in the management of prostate cancer, which of the following statements is most correct?

- A. Immediate postoperative radiation for high risk patients improves survival compared to salvage radiation.
- B. Androgen deprivation in combination with external beam radiation is associated with improved local control and disease free survival for high risk patients.
- C. According to randomized dose escalation studies, dose escalation to 78 Gy is associated with improved PSA free survival compared to 70 Gy in patients with favorable (PSA < 10) disease.
- D. According to randomized studies, the combination of external beam radiation and brachytherapy has been shown to be superior to external beam radiation alone in intermediate risk prostate cancer.

Key = B

Lung/Thorax

A patient with squamous cell carcinoma has a CT scan of the lung, revealing a 4-cm superior sulcus tumor that has invaded the chest wall with subcarinal metastasis. What is the most appropriate AJCC staging?

- A. T3N1
- B. T3N2
- C. T4N1
- D. T4N2
- E. T4N3

Key = B

According to the Radiation Therapy Oncology Group/Eastern Cooperative Oncology Group (RTOG/ECOG) hyperfractionation study for small cell lung cancer, when compared to hyperfractionation of 1.8 Gy daily to 45 Gy, hyperfractionation of 1.5 Gy BID to 45 Gy resulted in which of the following?

- A. Superior overall survival
- B. Superior local control
- C. Poorer overall survival
- D. Poorer local control

Key = A

Pediatrics/Pediatrics - Central Nervous System

According to randomized data, the combination of radiation and temozolamide for the treatment of glioblastoma multiforme results in what outcome?

- A. Improves survival for patients with glioblastoma multiforme
- B. Improves survival for patients with low- and intermediate-grade gliomas
- C. Improves disease-free but not overall survival for glioblastoma multiforme
- D. Improves disease-free but not overall survival for patients with low- and intermediate-grade gliomas

Key = A

For children older than 3 year of age, what is the appropriate treatment of medulloblastoma?

- A. Platinum based chemotherapy, craniospinal radiation, and posterior fossa boost
- B. Craniospinal radiation, posterior fossa boost without chemotherapy
- C. Platinum based chemotherapy, cranial radiation with a posterior fossa boost
- D. Platinum based chemotherapy and radiation to the posterior fossa only

Key = A