

## Radiation Oncology MOC Study Guide

The following study guide is intended to give the diplomate a general overview of the material covered on the MOC examination, and to provide examples of the scope and level of questions on the maintenance of certification exam. The purpose of the cognitive exam is to assess practical knowledge in radiation oncology, and it is intended that the examination will be geared toward the practicing general radiation oncologist.

The distribution and content of the examination is 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.

- Peds/Peds\_CNS
- GI
- GYN
- GU
- Lymphoma/Leukemia
- Head and Neck/Skin
- Lung
- Breast
- Bone/Sarcoma
- CNS

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

### **Physics:**

The physics questions on the examination are intended to cover areas of physics knowledge 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 upon which the practice of radiation oncology is based.

### **Biostatistics and Ethics:**

These are general questions covering the broad areas of statistics and ethics as they relate to the practice of radiation oncology

Below are examples of typical questions included in the exam. One sample question in physics and radiation biology are included as well as two questions in each of the major clinical areas. It is anticipated that the scope and level of the MOC cognitive exam is roughly reflected in the sample question below:

### Physics:

The depth in centimeters to which electron beam provides effective coverage is roughly equivalent to:

- a. Half the energy of the electrons
- b. One third of the energy of the electrons
- c. Twice the energy of the electrons
- d. Equal to the energy of the electrons
- e. Unrelated to the electron energy

Key b.

### 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 NSAB-06 lumpectomy with radiation compared to lumpectomy alone results in:

- a. Higher rates of local control and higher overall survival
- b. Higher rates of local control and higher rates of second malignance
- c. Higher rates of local control with equivalent survival
- d. Higher rates of local control and lower rates of distant metastasis.

Key c

Which of the following drugs is routinely given as adjuvant therapy in patients with lymph node involvement whose tumors overexpress Her2/neu

- a. Adriamycin
- b. C225

- c. Herceptin
- d. Cytosin
- e. Tamoxifen

Key c

## Head and Neck

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

- 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. 2Gy daily to 64-66 Gy
- b. 2.25 Gy daily to 56-63 Gy
- c. 2.5 Gy daily to 50-55 Gy
- d. 1.8 Gy Daily to 60- 63 Gy

Key d

## GI

According to the GITSG postoperative randomized trial for pancreatic cancer, postoperative chemo-radiation compared to surgery alone was associated with;

- 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 over 50% in the chemo-radiation arms

Key b.

The appropriate AJCC Stage for a rectal tumor which invaded through the muscularis propria into the subserosa, with 2 regional nodes of 16 removed, the appropriate AJCC staging is

- a. T2N2
- b. T2N1
- c. T3N1
- d. T4N1
- e. T1N1

Key c

## GYN

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

- a. less than 20%
- b. 20-30%
- c. 30-50%
- d. >50%

key c.

Randomized trials evaluating chemotherapy in combination with radiation have demonstrated the following:

- a. No improvement in local control or survival with any form of chemotherapy
- b. Improved survival and local control with neo-adjuvant 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 chemo-radiation

Key d

## Lymphoma

Which of the following classifications of Hodgkins disease has the most favorable prognosis

- a. Lymphocyte predominant
- b. Nodular Sclerosis
- c. Mixed Cellularity
- d. Lymphocyte depletion

Key a.

All of the following are drug combinations used for the treatment of Hodgkins disease except:

- a. ABVD
- b. MOPP/ABVD
- c. Stanford V
- d. ACT
- e. BEACOPP

Key d.

## GU

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

- a. Iodine 125
- b. Paladium 103
- c. Au-198
- d. Iridium-192

Key d.

Regarding radiation therapy in the management of prostate cancer, which of the following 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 CT Scan of a patient with Squamous Cell Carcinoma of the Lung reveals a 4 Cm Superior Sulcus tumor which invades the chest wall with subcarinal metastasis. The AJCC stage is:

- a. T4N2
- b. T3N2
- c. T4N3
- d. T3N1
- e. T4N1

Key b.

According to the RTOG/ECOG hyperfractionation study for small cell lung cancer:

- a. Hyperfractionation of 1.5 Gy BID to 45 Gy resulted in superior overall survival compared to 1.8 Gy daily to 45 Gy.
- b. Hyperfractionation of 1.2 Gy BID To 60 Gy revealed superior local control compared to 2 Gy daily to 60 Gy.
- c. Hyperfractionation showed no advantage of conventional daily fractionation.
- d. Although local control was superior with hyperfractionation, survival was poorer due to treatment related toxicities.

Key = A

### PEDS/CNS

According to randomized data, the combination of radiation and temozolamide for the treatment of glioblastoma multiforme:

- 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. Shows no survival difference, but increased toxicity in patients with gliomas.

Key = A

For children older than 3 year of age, appropriate treatment of medulloblastoma includes:

- 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 posteror fossa only.

Key = A