

BASIC RADIOLOGICAL PHYSICS COURSE

CLASS GROUP: _____
(Radiation Therapy, Radiation Oncology Resident, Post Doctoral..)

YEAR: _____
(2004, 2005 ...)

Objective:

After completing this Study Guide #6, the students should be able to understand other means of minimizing radiation exposures. This includes (1) warning signs, (2) proper storage of radioactive materials, (3) proper disposal of radioactive materials, (5) radioactive shipment, and (6) brachytherapy procedures.

Study Guide #6: Health Protection II (Part 1 of 2)

Read Sections: Foundation of Radiological Physics (CBSaw)
Chapter 14 – Health Physics II
Sections 14.1 to 14.6

Suggested Reference: Faiz Khan's text – Chapter 16

Assignments: Answer all questions as directed in this handout

Clinical Rotation Assignment: What type of radiation is produced in your linear accelerator?

STUDY GUIDE

- 14.1 In your own words, define the following terms:
- | | |
|----------------------|---------------------------|
| (a) controlled areas | (b) non-controlled areas |
| (c) hot lab | (d) radioactive safe |
| (e) leak test | (f) transport index |
| (g) brachytherapy | (h) afterloading catheter |
- 14.2 Identify the precautionary signs and state the conditions under which they are posted.
- 14.3 What is the color designation of a radiation precautionary sign?
- 14.4 List four tasks that must be done to convert a room into a hot lab.
- 14.5 Explain the function of an inventory system for a hot lab.
- 14.6 What is the amount of radioactivity that is considered a positive leak test?
- 14.7 Identify two situations where area monitors are useful.

- 14.8 Identify four methods of disposing radioactive wastes.
- 14.9 What are the regulatory requirements regarding the disposal of radioactive human excreta?
- 14.10 Describe the procedures for receiving a radioactive shipment.
- 14.11 Describe the procedures for forwarding a radioactive shipment.
- 14.12 Which radiation detecting instrument is appropriate for performing a wipe test?
- 14.13 Explain the radiation precaution guidelines in a brachytherapy procedure regarding (a) posting, (b) survey, (c) shielding, (d) transportation of sources, and e) hot lab.
- 14.14 A patient underwent an endobronchial treatment with an iridium-192 ribbon. During the treatment, a nurse noted that the ribbon was outside the patient's nose. The nurse decided to coil the ribbon and taped it to the patient's face. This occurrence has resulted in unnecessary exposure of about 17.8 rem to the nurse's hand and 1032 rad to the patient's face. Identify the cause of this misadministration and what corrective actions will be taken to prevent this type of incident from recurring.
- 14.15 Explain the radiation precaution guidelines regarding a radioiodine treatment.
- 14.16 Padding is placed all over the patient's room to restrict contamination of radioiodine. Explain how the contamination occurs.

PROBLEMS

Multiple Choice Questions

Select the one correct answer.

- 14.1 Which of the following caution labels should be placed at the door of a cobalt teletherapy unit?
 - I. "Caution Radiation Area"
 - II. "Caution High Radiation Area"
 - III. "Caution Radioactive Materials"
 - a) I only
 - b) I and II
 - c) I and III
 - d) II and III
 - e) I, II, and III

- 14.2 Which of the following is NOT TRUE about hot labs?
- a) A radioactive source safe is usually available in a hot lab.
 - b) Hot labs should always be locked when unattended.
 - c) Hot labs must be surveyed on a periodic basis.
 - d) Logbooks are used to trace the location of sources removed from the hot labs.
 - e) none of the above.
- 14.3 Which instrument should be used in the survey of misplaced sources after brachytherapy procedures?
- a) Geiger-Muller counter
 - b) proportional counter
 - c) ionization survey meter
 - d) pocket dosimeter
 - e) none of the above
- 14.4 Which of the following is NOT a possible method of radioactive waste disposal?
- a) Place in storage for decay
 - b) Release to the environment
 - c) Discharge into the sewer system
 - d) Submitted to an authorized burial site
 - e) none of the above
- 14.5 Which of the following is NOT TRUE of brachytherapy procedures?
- a) Sources should be transported in lead containers.
 - b) Radiation precaution sign should be posted in front of patient's room door.
 - c) Radiation survey should be performed after the sources are removed.
 - d) Shielded bench should be provided for source handling.
 - e) none of the above.

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