General Radiation Safety

Radiology Services

Radiation is the emission of energy from matter, similar to light emitted from a light bulb. Radiation cannot be seen, felt, or detected by our human senses. This self-directed learning module contains information you are expected to know to protect our patients, our guests, and you.

Target Audience: Healthcare workers who may come in contact with radiation and/or radioactive materials.

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Instructions:

This module is intended to provide basic radiation safety information for ancillary personnel who occasionally work in areas posted with the radiation symbol.

After completing this module, contact your supervisor to obtain additional information specific to your department or work area.

- Read this module.
- If you have any questions about the material, ask your supervisor.
- Complete the online posttest for this module.

Learning Objectives:

When you finish this module, you will be able to:

- Recognize the radiation symbol.
- Name several areas within the hospital setting which may have radiation caution signs.
- Discuss the steps to take if you have questions regarding radiation safety.
What Is Radiation?

Radiation is the emission of energy from matter, similar to light emitted from a light bulb. Radiation cannot be seen, felt, or detected by our human senses, although certain types of radiation may be detected with special instruments used by Nuclear Medicine, Radiology, and Radiation Oncology/Radiation Therapy.

Radiation is used by physicians to diagnose and treat diseases. It is also used in research. Radiation is found in the following hospital areas:

1. Radiology Department
2. Nuclear Medicine and PET
3. Radiation Oncology/Radiation Therapy
4. In-Patient rooms in which patients are receiving radiation treatments
5. Cannon Research Center at Carolinas Medical Center

Background radiation is radiation which is always present around us. Background radiation is found in the food we eat, the air we breathe, in concrete and other building materials, and in rocks and soil. Our normal dose from background radiation is about 300 mrem per year. A chest x-ray delivers about 10 mrem to the patient. Regulations limit the radiation dose to a non-radiation worker and member of the general public to 100 mrem per year. X-ray rooms, patient treatment rooms, scan rooms and research labs are designed with lead and structural shielding to meet the 100 mrem per year limit.

Radiation Warning Signs and Symbols

Areas where radiation machines or radioactive materials are used are posted with the following universal symbol:

The symbol is required to have a yellow background. The three blades can be black, purple, or magenta. Only employees with the proper training are allowed to work in areas posted with this symbol.
Rooms in the Radiology Department where x-ray machines are used are posted with the following symbol:

This sign may also be posted on mobile x-ray machines found inside and outside the Radiology Department. Certain rooms in Radiology and Radiation Therapy may have flashing lights above the room doors, do not enter these rooms if the light is flashing.

The radiation symbol is placed on doors to hospital rooms where patients receive radiation treatments. Specific instructions are also posted on the room door. These doors should remain closed during patient treatment. Follow the instructions posted on the door.

This symbol is also found on items used in research using radioactive materials and outside certain approved laboratories in the Cannon Research Center on the Carolinas Medical Center campus. Glassware, trays, and shields used with radioactive material in research may have this warning symbol. Some labs post a bench area with tape displaying the radiation symbol. Items on this bench should not be touched or disturbed.

Basic Radiation Safety Rules

1. Follow all posted signs and instructions. If you have questions about a specific room or area, ask your supervisor.

2. Do not handle or touch anything posted with the radiation symbol.

3. Do not dispose of anything labeled with the radiation symbol.

4. Radioactive waste is held in special containers in Nuclear Medicine, PET and the research labs in Cannon. This waste is to be disposed of only by certain personnel. DO NOT empty these containers. Direct all questions to your supervisor.
5. Announce yourself when entering a radiation lab in Cannon or a posted room in Nuclear Medicine, PET, Radiology, or Radiation Oncology/Radiation Therapy.

6. If there is a spill involving radioactive material in a radiation laboratory or posted area, DO NOT clean up the spill. Notify your supervisor, the laboratory personnel, and the Radiation Safety Officer.

7. Radioactive material requires proper storage and security. If you find a suspicious box or container with the radiation symbol on it, notify your supervisor and the Radiation Safety Officer.

8. In an emergency, follow all normal emergency procedures and disregard any concern about radiation exposure. The radiation exposure should be minimal. Notify your supervisor and the Radiation Safety Officer.

9. Call the Radiation Safety Officer if you have any questions:

   **CMC Radiation Safety Officer:**
   Beth Franklin, phone 704-355-5370 or pager 704-346-1142

   **CMC NorthEast Radiation Safety Officer:**
   Chris Puckett: Phone: 704-403-3100, ext. 66166 or pager 704-793-0115
Posttest

Name: _____________________________________________

Date: _____________________________________________

Circle the correct answer.

1. Common hospital departments which use radiation or radioactive materials include:
   a. Radiology
   b. Nuclear Medicine
   c. Radiation Therapy
   d. All of the above

2. An area in the hospital where radiation or radioactive material is used is required to be posted with a universal caution sign
   a. True
   b. False

3. A leak is found in the Nuclear Medicine Department. You should:
   a. Clean up the spill and fill out an incident report
   b. Notify your supervisor
   c. Leave the area and ignore the spill

4. The background color of the radiation warning sign:
   a. Can be any light color
   b. Is purple
   c. Is required to be yellow

5. Waste from a bench posted with the radiation symbol in a laboratory can be emptied with the biohazardous waste:
   a. True
   b. False