

## **Radiation**

Marie Curie died due to excess exposure to her discovery, radium. Thomas Edison invented the fluoroscope, but stopped his work in this area when his assistant died of an x-ray overdose. Many years later, we have a better understanding of the dangers of radiation, and yet, we often fail to handle it safely. It is easy to become complacent about the dangers of radiation: it is invisible and odorless, and often we are so caught up in performing procedures that we overlook the tools that help us accomplish this goal. As a result, we may expose patients as well as ourselves to higher levels of radiation than necessary. The World Health Organization (WHO) has classified radiation as a carcinogen. The risks of excess radiation exposure are not insignificant, potentially leading to a variety of health issues, from cataracts and hair loss to birth defects and the development of cancers. Following the best radiation safety practices, therefore, is beneficial both for patients and healthcare workers. The top three sources of excessive and risky radiation are nuclear medicine, computed tomography (CT) and fluoroscopy, often employed in long exposures during endovascular procedures. Those who regularly work with radiation need to take a long, hard look at their actions and ask themselves if they and their co-workers are doing everything they can to reduce exposure, for their own sake as well as for patients.

In most hospitals, radiation safety is the joint responsibility of the facility's radiation safety officer and the technologists who work in the department. The safety officer keeps track of healthcare workers' radiation exposure via the dosimetry badges that should be worn at all times and turned in every month for exposure assessment by an outside company. The American Council on Radiation Protection & Measurements allows that those who work with radiation can safely receive 5,000 millirems a year, in addition to what they receive in background radiation. Once or twice a year, the state typically performs an inspection. Additionally, the Joint Commission requires hospitals to have written procedures regarding the use of precautions and personal protective equipment regarding the use of hazardous materials, which include radiation and x-ray equipment. The Commission requires that hospitals provide protective devices, such as lead aprons and shields, and show they are worn as required. They also require records be maintained regarding individual worker exposure, as recorded by dosimetry badges. But when no one's watching, it's easy to fall back into bad habits and complacency. Hospitals get busy and when a dosimetry badge value comes back high, some clinicians choose not to wear a badge, rather than take the time to determine the cause. Radiation is an important diagnostic tool, but it must be treated with respect. It has become apparent that there is significant room for improvement in radiation safety practices, which can vary widely from institution to institution, and from clinician to clinician. All who work in hospital radiation environments, including technologists, nurses, physicians and others, must make a commitment to the safer use of radiation, for the good of everyone.

<http://www.cathlabdigest.com/articles/Importance-Radiation-Safety-Healthcare-Workers-Well-Patients>

**Exercises:**

**I. Read the text and answer the questions:**

1. When can radiation be dangerous?
2. Why has radiation been classified as a carcinogen?
3. What are the risks of excess radiation?
4. What are the top sources of risky radiation?
5. What are the radiation safety procedures for patients and healthcare workers?
6. What is a safe radiation amount per year for healthcare workers?
7. What are dosimetry badges used for?

**II. Match the following words (1-10) with their definitions (a-j)**

1. complacency
  2. fluoroscopy
  3. exposure
  4. overdose
  5. to overlook
  6. to employ
  7. endovascular
  8. millirem
  9. shield
  10. precaution
- a. a unit of absorbed radiation dose
- b. an action taken in advance to prevent something dangerous or unpleasant from happening

- c. self-satisfaction especially when accompanied by unawareness of actual dangers or deficiencies
  - d. the state of having no protection from something harmful
  - e. to make use of
  - f. an examination of the tissues and deep structures of the body by x-ray, using the fluoroscope
  - g. more than the normal or recommended amount
  - h. protection from a danger or risk
  - i. to fail to notice, disregard
  - j. inside blood vessels
- 1....2....3....4....5.....6....7....8....9....10....

**III. Explain in English the meaning of the following phrases:**

- 1. to accomplish a goal
- 2. to keep track of
- 3. for their own sake

**IV. Find negative forms of the following adjectives in the above text:**

- 1. significant-
- 2. visible-
- 3. fortunate-

**V. Form adjectives from the following nouns. Use one of the following suffixes: -y, -less, -al, -ive, -ous.**

- 1. benefit – benefic....
- 2. odor-

3. hazard-
4. risk-
5. excess-
6. protection-

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