

NAME : HUMA NAWAZ

ID NO : 15037

VIVA : RADIATION PROTECTION

SUBMITTED TO : MAM ATOOFAH
AZMAT

DATE : 13th July, 2020

(1)

QUESTION NO: 1

Describe the role of radiation protection officer in radiology department.

ANSWER:

RADIATION PROTECTION OFFICER

(RPO):

⇒ RPO is a specialist in radiation safety and compliance matters and is an appointed position within University Health and Safety Services.

⇒ The role of RPO is to support the University's work with ionizing radiations by ensuring arrangements are in place to manage radiation risks, so that work is carried out safely and in compliance with regulations and so that university employees and the public are protected from harmful effects.

ROLE OF (RPO):

1. Acting as the point of contact within the university for the external Radiation protection Adviser (RPA).

(2)

2. Acting as the point of contact within the University for regulators relevant to ionising radiations compliance i.e. the Environment Agency and the Health and Safety Executive.

3. Preparing periodic status reports on radiation safety and management for purpose of University governance.

4. Managing Environment Agency permits including

→ Make application for new or variation to existing EA permits.

→ Manage the collation of waste product and make pollution Inventory returns to EA on behalf of the university.

→ Advise on routes of radioactive waste proposal.

5. Arranging for disposal of radioactive waste to authorised contractors.

6. Managing facility or site decommissioning.

7. Managing a system for the provision of personal dosimetry and associated

(3)

record keeping.

8. Managing an inventory of equipment capable of emitting x-rays.
9. Advising on training in radiation safety.
10. Performing measurements to check radiation doses, dose rates and activity.

QUESTION NO: 2

Elaborate the radiation protection measures in a safe radiology department.

ANSWER:

SAFETY MEASURES IN RADIOLOGY DEPARTMENT:

Use time, distance, shielding and containment to reduce exposure.

1: TIME :

Minimize time spent in areas with elevated radiation levels.

Minimizing the exposure time reduces a worker's dose from the radiation

(4)

Source.

2: DISTANCE :

- ⇒ Maximize distance from source of radiation.
- ⇒ A worker dose decreases as the worker's distance from the source increases.

3: SHIELDING :

- ⇒ Use shielding for radiation sources i.e. placing an appropriate shield between source of radiation and workers.
- ⇒ Inserting the proper shielding e.g. lead, concrete or special plastic shields depending on the type of radiation between a worker and a radiation source.

4. ALARA :

- ⇒ stands for As low as Reasonably Achievable.
- ⇒ It is a guiding principle in radiation protection used to eliminate radiation doses that have no direct benefit.

5. CHECKING PATIENTS FOR PREGNANCY :

- ⇒ The safety plan involves checking

(5)

female patients for pregnancy before exposure.

6. RADIOACTIVE MATERIALS :

⇒ The safety plan involves the management of radioactive materials used for therapeutic and diagnosis purposes.

7. SAFETY WARNINGS :

⇒ The safety plan involves pasting of safety warnings on the door.

8. DOSIMETRY TOOLS :

⇒ The radiation dosimetry tools and staff radiation exposure for the past twelve months.

9. WEAR APRON :

⇒ The safety plan involves to wear apron.

QUESTION NO: 3

What are radiation hazards that one should be beware off.

ANSWER :

RADIATION HAZARD:

Radiation injury causes changes in the living tissues causing radiation sickness.

SOMATIC EFFECTS:

Harmful to the person

GENETIC EFFECTS:

Reflected in the offspring

1. Radiation decomposition i.e. splitting of water into H^+ and OH^- and also splitting of other solvents of the body.
2. Kinetic energy of the incident photons heats up the molecules of the living tissues
3. Ionization is another process where the radiations interact with the matter forms ions
4. High energy electromagnetic radiation and particle radiation are capable of producing ions in their passage through matter.

(7)

TYPES OF RADIATION HAZARDS:

Alpha

Beta particles

X-Rays

Gamma Rays

X-rays machines and radioisotopes are the two important and potential sources of ionizing radiation.

HOW TO BEWARE OFF :

- ⇒ The distance between the radiation source and personnel exposed should be increased.
- ⇒ Allow only operator in the X-ray room when exposures are made.
- ⇒ Behind the shielding screen or at least 6 feet away from the source the exposure
- ⇒ Fluoroscopy should never be used as a substitute for a non motion radiographic procedures as amount of radiations is extremely large in fluoroscopy.

(8)

QUESTION NO: 4

How a radiation technologist can protect himself/herself from radiation, what is annual occupational dose.

ANSWER:

SAFETY MEASUREMENTS FOR THE RADIOLOGIC

TECHNOLOGIST:

The following are the safety measurements for the radiologic technologist.

X-rays rooms have barrier walls and windows that keep exposure inside the room.

1. Understand and apply the cardinal principles of radiation control:

- ⇒ Time
- ⇒ Distance
- ⇒ Shielding

(9)

2. Do not allow familiarity to result in false security.
3. Never stand in the primary beam.
4. Always wear protective apparel when not behind a protective barrier.
5. Always wear an occupational radiation monitor and position it outside the protective apron at the collar.
6. Never hold a patient during radiographic examination.
7. Use mechanical restraining devices when possible.
8. The person who is holding patient must always wear a protective apron and if possible protective gloves.
9. Always collimate to the smallest field size appropriate for the examination.
10. The technicians also wear lead aprons gloves goggles and masks for radiation protection when necessary.

(10)

ANNUAL OCCUPATIONAL

DOSE:

- It's a dose limit which is standard for the protection against the radiation.
- The limit may vary and depend upon the affected part of the body.
- Occupational radiation exposure is recorded in rem or Roentgen equivalent man.

⇒ Whole body	5000 millirem
⇒ Extremities	5000 millirem
⇒ Lens of eye	15000 millirem
⇒ Fetus	500 millirem
⇒ Individual in the public	100 millirem

END OF ASSIGNMENT...!