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QUESTION No 01
ANSWER
ROLE OF RADIATION PROTECTION OFFICER:-

The officer of radiation protection are responsible for the safe use of ~~ionization~~ ionizing radiations producing equipement.

=> Following are the responsibilities or Roles of a RPO:-

(1) Stop Operations which are identified as unsafe. (1)

(2) He helps in identifying and solving the radiation safety problems.

(3) He verify all the implementation of Corrective Actions.

(4) He have to be available for the contact by the faculty staff and liscense conditions.

(5) He will have to notify the management about the problems regarding radiation safety.

(6) He recommends the corrective actions for the safety.

(7) He initiate the corrective

Actions for the radiation safety.

(8) He reviews all the RPP change before the implementation.

(9) He oversee the the RPP operational aspect.

(10) He ensures that the radiation activities are performed in accordance with the procedures which are license approved.

(11) The RSO helps in ensuring that that the duties are performed in a proper way.

(12) The RSO itself is responsible for the day to day radiation safety assurance.

(13) The RSO provides comitments to stop an operations if he/she considers that the operation is unsafe.

QUESTION No 02

ANSWER

MEASURES FOR RADIATION PROTECTIONS:-

↳ Radiation protection is important for the reduction of dose.

↳ By using simple protective measures, the technologist can handle or safe the patient from taking excessive dose.

↳ Following are the same radiation protection measures.

(1) SHIELDING:-

↳ The radiation source can be shielded with a protective material which absorbs the

radiation energy.

↳ The material may be a liquid or a solid material.

↳ Room shielding can be done by lead lined wall, and lead glass windows

↳ There are shielding or radiation protection equipments in the department like glove gloves, aprons or lead lined plaster board. etc.

↳ It is recommended that the incharge should cover the patient, gonads, thyroid by giving him an apron or else.

(2) Time:-

↳ It is necessary to minimize the procedure exposure timing as much as possible.

↳ By minimizing the time, you can protect the patient from getting a high dose, in short you will directly minimize the dose.

↳ It is suggested to pre-plan the examination, in this way you can easily manage time and can save a patient from getting a high dose.

↳ By reducing the time, the operator can improve his ability or skills

of handling with a radio-active material in a small given time.

MEASURING RADIATION DOSE:-

↳ Always use an equipement which can measure the radiation Dose. like Dosimeter. Dosimeter can help in measuring the occupation dose.

↳ It is suggested to ~~practive~~ practice the ALARA (AS LOW AS REASONA-BLY ACHIEVABLE).

DISTANCE:-

↳ Distance is one of the best factor by which you can ~~reduce~~ reduce the patient Dose.

- If double distance from the source to the patient, you will reduce the intensity by 25%., it is known as inverse square law.

- The greater the distance, the lesser will be the dose, But keep the distance as much as required for the procedure.

↳ Ceiling - Suspended protective screen can also provide protection; The effectiveness totally depend on the ~~cor~~ ~~cor~~ them, if they are correctly positioned or not. Typically provide protection to the upper portion of Body i.e Head, eyes.

↳

↳ The protective worn cha can help in attenuating the scatter radiations.

"Q2 PART"

LISTS OF PROTECTIVE MEASURES

(1) Cardinal Principles
- ↳ Time :- Min Time
- ↳ Distance :- Max Distance
- ↳ Shielding :- It includes all of the following:-

① Protective Gloves.
② Lead Apron.
③ Lead Glasses.
④ Lead Barriers.
⑤ Mobile Lead Shields.
⑥ ~~Apreal~~ Apparel.
⑦ Gonadal Shields.

(2) Collamination: to interested area.

(3) Filteration to absorb low energy x-rays.

(P.T.O)

QUESTION No 03:

ANSWER

RADIATIONS HAZARDS:-

↳ Radiation can cause radiation sickness.

↳ It can do changes in a living cell and causing mutation.

↳ Radiation can cause types of effects like

↳ GENETIC:- (sochastic)
It can be transferred to offsprings.

↳ SOMATIC:-
These are temporary effects and are harmful to the patients/ person.

↳ Some of the radiations hazards are as follows:-

(1) The radiation when travells through the body, they knock out the electrons from the atoms causing ionization. These free electrons then interact with other ~~molecutt~~ Molecules because of unstability.

(2) Decomposition of Radiation. it splits water into OH^- or H^+.

(3) It can heats up the atoms or molecules of the living body. (11)

(4) The radiation can cause ionization of atoms and make ions.

(5) X-rays, Gama rays, alpha, beta particle etc can cause ionization.

(6) Pregnent Woman should not be involved in the radiographic examinations, Because the rays can affect the fetus.

(7) Person whose age is under 18 should be also not allowed to work in ~~radiogt~~ radiological departments, Because it can affect his Gonads. and can cause infertility.

Protective Barriers can help in radiation regards.

↳ "INDIRECT EFFECTS" :-

(1) Splitting water into ion can form an oxidizing agent called hydrogen peroxide which can breake the chemical Bonds.

(2) ~~Oxygnen~~ Oxygen can do enhancement in a reaction which is alway present in the cells, Making the reaction more serere.

DIRECT EFFECTS:

(1) The early effects of radiation are known as direct effect.

(2) The Radio-Sensitive cell are at more risk. And can cause Radiation Sickness.

(3) These affects can ~~affect~~ appear within days. and it include Vomit, Nausea, Diarrhea etc.

(4) The delayed or later effects includes leukemia, tumors, Cataracts etc.

QUESTION NO 04:-
ANSWER
"PART A"

Radiation is the part of our life. There are some natural ways from which the radiation emitts and also there are Man made to sourcess to.

The best way for a technologist to protect himself from radiation. is by following the protection principles.
During an emergency the principles can helps alot

the technologist to protect himself.

PRINCIPLES :-

↳ The Major principles of protection are given below.-

By these the technologist can protect in both normal & emergency situations.

↳ DISTANCE :-

Just like fire, when you move away from the fire, the heat reduces. in this way, the dose also get reduced if sometimes increase the distance between

the sources of radiation and patient.

Time:-

↳ Time is one of the component by which the radiologist can see save both patient and himself.

↳ Minimum time in a procedure, Minimum dose is given will be and also less scatter Radiation.

SHIELDING:-

↳ Lead barriers, Concrete can provide a protection. Gamma rays, x-rays can't penetrate through them.

ESSENTIAL COMMENDMENTS.

Following are some of commendments by which a technologist can protect himself.

1) Firstly, Understand and apply the cardinal principles i.e. Time, distance, shielding.

2) Never Stand in primary Beam.

3) Always wear a dosimeter.

4) Always wear a protective apron, gloves etc.

5) Use gonadal shielding to the patient too.

6) Never hold a patient during radiographic examination.

7) Use mechanical restraining devices.

8) Always collaminate to the smallest and to the interest region.

PART B

ANNUAL OCCUPATIONAL DOSE:-

It is a dose limit, which is standard for the protection against the radiation.

The limit may vary, and depends upon the affected part of the body.

* THE ANNUAL EXPOSURE

	ACTIVITIES	DOSES
1)	Chest X-ray	6 millirem per X-ray.
2)	Dental X-ray	10 millirem per X-ray

	Activity	Dose
3)	Drinking Water	5 millirem/year
4)	Coal Burning Power Plant	0.165 millirem/year
5)	Smoking	280 millirem/year
6)	Radioactive Material Used in UNG Lab	< 10 millirem/year
7)	Cross Country Round Trip By air	5 millirem/trip