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viva assignment protection

Ans: 1.

Role of Radiation protection officer

X-ray Radiation officers are responsible for ensuring the safe use of ionization radiation-producing equipment at registered facilities in Minnesota.

Registrant are responsible for x-ray equipment that is under their administrative control. and must ensure that the radiation safety / quality assurance program that the radiation staff and user of x-ray equipment in compliance with Minnesota Rule. that radiation safe quality and assurance program an RSO must be designed.

=> The RSO must be identified with in the radiation safety / Quality assurance program.

=> The RSO is responsiable for the day-to-day operations of the radiation safety / Quality assurance program.

=> The RSO must recieved RSO specific training and his additional responsiability beyond their day to day job duties.

=> The RSO must provided sufficient time and commitment from the registrant so top operation that, He or SHE consider unsafe, ensure x-ray equipment is used safely, and compliance with MDH-x ray Rules.

=> When the regestrant is also RSO, and RSO Delegation agreement does not have to be completed.

=> Thes responsiabily must be in written form from regestrant to RSO

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Answer No 2:-

Safe measurment in Radi-iolog department.

1: Minimize Exposure:

=> You should Remember to minimize your exposur at all possible times.

2-Measure your Radiation Dose

Dosimeters

=> use to measure the occupational dose and equivalent from x-ray, gamma and high energy beta emitters.

=> Always practice ALARA

(As Low as Reasonable achievable)

3- Three Effective strategies-

=Time

=> First minimize the time and you will minimize the dose.

=> pre- plan the procedure to minimize exposure time

4- Three effective strategies

① Distance.

=> Doubling the distance from the source can reduce exposure intensity by 25%.

=> Know the radiation intensity where you perform most of your work and ~~again~~ move to last

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Does areas during work delays

5) Three effective strategies - Shielding.

=> The position of shielding b/w yourself and the source of radiation at all permissible times and take advantage of permenent shield (i.e equipent of existing structures

=> select appropriate shielding material during the planning stage of the procedure.

6: Room shielding.

7= Radiation protection in X-Ray.

=> Lead apron.

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Recommendation

⇒ shield thyroid and gonads. always wear lead apron and use dosimeter to monitor the exposure

⇒ The CT should more justified

⇒ Patient education is important

⇒ There should be a universal x-ray bank where patient x-ray can be accessible anywhere, from any hospital.

Ans No 3

Radiation hazard:

=> Radiation injury causes changes in the living tissues causing radiation sickness

Somatic effect:

Harmful to the person.

genetic effect

Reflected in the offspring.

* Radiation decomposition i.e. splitting of water into H^+ and OH and also splitting of these solvents of the body.

* Kinetic energy of the incident photon heat up the molecule of the living tissue.

* Incident Radiation when travaling through the body tissues knock out the bound electron Free from their parent atom or molecules these Free electron are highly unstable and interact with other atom and molecules with in the irradiated system.

* Ionization is the another process where the radiation interact with matter to form ions

* High energy electromagnetic radiation and particale radiation are capable of producing ions in their passage through matter.

* type of Ionizing radiation include alpha and beta particale x-ray gamma rays etc x-ray machine and radioisotope are the two important and potential source of ionization radiation

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* Indirect effect

* Since 80% of the biological tissue is water.

=> Most of the incident radiation energy is absorbe by the water molecule and these are broken into very unstable and reactive component. These then react with body molecule cause the cell damage.

* Due to generation of H and OH radicals. Subsequent to many series of reaction hydrogen peroxide is formed which is highly reactive oxidizing compound and break chemical bond and macromolecule of the body such as protein, lipids and other nucleic acid etc causing cellular damage cell death and mutation.

* The biological effect are enhanced by the presence of oxygen which is alway present in the cell.

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* Lymphoid cell, Epithelial cell of the small intestine, Hamopiutic cells, Germinal cells, epithalial cell of the skin, connective tissue cell cartilage and growing bone cells, cells of the brain and spinal cord cell of the skeletal muscle, and mature bone.

The early effect of radiation is a result direct injury to the tissue simultaneously and considerable distruction to the radiosensitive lead to the radiation sickness This effect appear with in days or week after expoure and include nausea, vomition malaise diarhia, fever and hemorrhage

The delayed effective of radiation including shortening of life span.

This appear after month or even many years of expoure.

Ans 4:

Protecting your self from Radiation:

⇒ Radiation is a part of our life. background radiation Coming primerly from nature minerals is around us all the time. There are few situations within an area average person is exposed to un-controlled sources of radiation above background. Nevertheless. it is wise to prepared and know what to do if such a situation arises.

One of the best way to be prepared is to understand the radiation protection principal of time. distance shielding, During a radiological emergence we can use the principales to help protect ourselves and our families.

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Time, Distance, shielding.

This can minmize yours exposes to radiation in much the same way as the would to protective you against 'overexposure to the sun.

Time

: The people who are exposed to radiation in addition to the nature background radiation limiting or minimizing the exposure time reduce the dose from the radiation source.

Distance:

The dose of radiation decreases dramatically as you increase your distance from the source.

Shielding:

Therefore inserting the proper shield b/w you and a radiation source or eliminate the dose you receive,

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Annual occupational dose:

Activity	Typical dose.
smoking	280 millirem / year
Radioactive materials use in a UM lab	< 10 millirem / year
Dental x-ray	10 millirem per x-ray
chest x-ray	10 millirem per x-ray.
drinking water	5 millirem per x-ray
Cross Country round trip by air	5 millirem per x-ray
Coal building power plant	0.167 millirem / year