SUBJECT: RADIATION SAFETY

Ionizing radiation can damage living tissues and may produce long term effects. Patients and personnel should be protected from scatter and nonessential direct exposure to radiation.

GLOSSARY

Absorbed dose - Energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The special unit of absorbed dose is the rad.

Attenuation - The process by which a beam of radiation is reduced in intensity when passing through some material.

Beam - Unidirectional flow of electromagnetic radiation or particles.

Decay, radioactive - Disintegration of the nucleus of a nuclide by spontaneous emissions of charged particles and/or protons.

Distance - The greater the distance from the source of radiation the less exposure.

Exposure - A measure of the total quantity of radiation reaching a specific point. Exposure is controlled in three ways: shielding, distance, and time.

Film badge - A personal monitoring device that uses film as a sensing medium to determine the occupational exposure of workers to ionizing radiation.

Fluoroscopy - The observation of the internal features of an object by means of the fluorescence produced on a screen by x-rays transmitted through the object. Personnel can receive 10 times more radiation during one minute of fluoroscopy than one x-ray film exposure.

Gamma radiation - The emission of electromagnetic energy from the nucleus of an atom.

Half life, biological - The time required for the body to eliminate one half of an administered dosage of any substance by regular processes of elimination.

Half life, radioactive - The time required for a radioactive substance to lose 50% of its activity by decay.

Ionizing radiation - Electromagnetic radiation which yields ions as it passes through tissue.

MPD - Maximum permissible dose of x-ray per quarter.
- whole body - 1.25 rem
- skin - 7.5 rem
- hands - 18.75 rem
- other organs (thyroid) - 15 rem

RAD - Radiation absorbed dose.
REM  -(Roentgen-Equivalent-Man) The amount of ionizing radiation, absorbed by man, that is required to produce a biologic effect equivalent to one roentgen.

Scatter radiation  -Radiation scattered when an x-ray beam strikes a patient's body, as it passes through the body, and as it strikes the table, the floor, and/or the walls.

Shielding  -The best protection for those working close to a source of radiation.

PROCEDURE:

1. Patient protection should occur based upon the location of the x-ray beam. See the Radiation Protection Plan for guidance.

2. Signs shall be posted when radiologic equipment is in use.

3. A sign warning females who might be pregnant to alert the clinical staff should be posted.

4. Females of child bearing age who are schedule for procedure using a C-arm shall be asked of the possibility of pregnancy.

5. All reasonable means of reconciling an incorrect needle, sponge and/or instrument count should be implemented before using a radiologic exam to locate an unaccounted for item.

6. Personnel who cannot leave the room should wear protective aprons and position themselves away from the x-ray beam.

7. Personnel wearing aprons should always face the x-ray unit

8. Radiation monitoring devices should be worn by personnel who are in frequent proximity to radiation and should be worn on the same area of the body at all times.

9. Aprons shall be laid flat or hung by the shoulders when not in use.

10. Measures taken to protect the patient from exposure shall be documented. Documentation shall include the type of protection and the area(s) protected.

11. Only the area of interest is to be irradiated. Coning and lead protections are to be used to limit the exposure area.

12. Only qualified personnel shall operate radiation producing equipment.

13. Technique charts are to be consulted when applicable.

14. Automatic exposure control is to be used whenever possible.
15. Mechanical holding devices shall be used when the technique permits. No individual shall be used routinely to hold film or patients. When holding is required, the person holding shall be provided with protective clothing (such as an apron and gloves) and shall be positioned so that no part of the body is struck by the useful beam.

16. Any malfunctioning equipment must be immediately reported to the Administrative Director.