Radiation Safety Refresher Training for Credentialed Fluoroscopy Users

Ten Things to Remember when using Fluoroscopy

1. X-ray photons are most harmful to the cells that are dividing most rapidly.
2. Time, Distance, and Shielding are the Cardinal Rules of Radiation Protection.
   a. The less time around the source of radiation, the better
   b. The greater distance from the source of radiation, the better
   c. Lead or lead equivalent shielding in between you and the source will stop most radiation from getting to you.
3. Radiation dosimeters are to be worn on the collar of the apron outside of the apron's protection.
4. When using fluoroscopy, keep the beam on time to a minimum.
5. As patient size increases, image quality decreases, patient dose increases, and occupational dose increases.
6. Keep the patient at a maximum distance from the x-ray tube.
7. Keep the image intensifier as close to the patient as possible.
8. Always use higher KVP and lower MAS techniques to lower patient dose while keeping appropriate image quality.
9. Occupational radiation workers must wear protective aprons, use shielding, monitor their doses, and know how to position themselves and the machines for minimum radiation dose.
10. Dose rates for fluorography are 10-60 times greater than those from fluoroscopy.

**** It is the physician who remains responsible for assuring that the x-rays are safely and properly applied, and that radiation protection measures are followed****

I have and read and understood the previous fluoroscopy safety information:

Signed: __________________________________________

Date: ____________________________________________
Baptist Health Policy regarding the use of Fluoroscopy in the Emergency Department:

- After assigning the room that is to be dedicated for C-arm use on a continuous basis, shielding design and shielding integrity testing must be performed and the results filed with the Office of Radiation Control of the state of Alabama.

- All signage consistent with a permanent fluoroscopy use shall be posted in the room.

- A dosimetry program for all clinical staff shall be maintained.

- An adequate supply of lead aprons shall be kept in the room and stored properly on hangers.

- The C-arm shall be password protected with the password secured by the Radiology Team Leaders. This password shall be changed monthly by the Radiology Team Leaders.

- A usage log will be kept with the C-arm to document case load and exposure time.

When an ED or Orthopedic Physician requests the use of a C-arm the following must be completed:

- The Emergency Department enters the order in the computer and directly notifies the on duty Radiology Team Leader.

- All family members of the affected patient and any other patients (and their family members) shall be removed before the C-arm is employed.

- A radiologic technologist shall be present at all times during the procedure.

- All individuals present during the procedure shall be properly shielded.

- The radiologic technologist present shall record fluoro time and the start and stop time of the procedure in the aforementioned log.

- Both pre and post procedure films will be obtained and submitted to the Radiologists for interpretation.

**Note:**

The ED or Orthopedic physician who requests the use of the C-arm should anticipate a 10-15 minute response time from the radiologic technologist.
CHAPTER 5: GENERAL X-RAY OPERATING AND SAFETY PROCEDURES

Physicians properly trained in radiological procedures shall order all x-ray exams and retakes.

**X-ray equipment shall be operated only by a trained x-ray technologist or by a physician properly trained in radiological procedures.**

An x-ray room or area is required to be posted with a caution sign because of the presence of radiation machines used solely for diagnosis in the healing arts. Doors to x-ray rooms must be closed during exposure.

Operators shall stand behind a protective barrier during exposures with stationary x-ray units. Visual and audible contact with the patient shall be maintained at all times.

Only individuals required for the exam shall be in the x-ray room during exposure. Clinical personnel required to be in the room shall be provided with lead aprons and dosimeters (when determined appropriate) and shall keep their bodies out of the direct beam. Protective lead garments shall be inspected annually for defects.

Collimators shall be used to restrict x-ray beams to the area of interest. At no time shall the beam size exceed the area of the image receptor. Light field and centering devices should be used to align the beam to the film.

Mechanical support devices shall be used to hold a patient in position whenever possible. If a patient must be held, the holder shall be provided with appropriate protective lead garments. Staff will wear radiation dosimeters outside the apron. Holders shall be positioned such that exposure is minimized and no unprotected body parts are exposed. No pregnant women or persons under 18 years of age will hold patients. Holders will be rotated such that no one employee holds patients regularly.

A technique chart shall be used and posted near the console. Exposure factors shall be appropriate for the size of the anatomical part examined and the age of the patient.

Neither the tube housing nor the collimator shall be hand held during an exposure.

Gonadal shields with 0.5mm lead equivalent shall be used on all children and adults of childbearing age if gonads are within 5cm of the field or unless contraindicated.

Radiation dosimeters are provided for all employees using or operating the x-ray unit. Dosimeters are to be worn on the collar or in the chest area and on the outside of lead aprons, when the protective garments are required. Dosimeters and control dosimeters will remain in a low radiation area within the facility when not in use. Dosimeters will not be shared.

The RSO or designee is responsible for the monthly or quarterly distribution of radiation dosimeters to the various departments that have radiation workers. Radiation exposure reports are available in the Office of Radiation Safety.

Exposures shall be restricted to 1250 mrem per calendar quarter; however, any radiation worker who exceeds our ALARA limit of 375 mrem per quarter will be investigated by the RSO.

A copy of Alabama Regulations for Radiation Control, a copy of radioactive material license #610, license application, radiation safety manual, etc., are available for review in the Radiation Safety Office. It is the responsibility of each radiation worker to report unsafe conditions to his/her supervisor or the RSO.

Only properly trained and authorized personnel shall be allowed to alter, tamper, or remove exposure-restricting equipment, including filters and collimator.

Reviewed January 2010
Kelly Putnam, ARSO
Baptist Health
1. X-ray operators and clinical personnel shall stand behind a protective lead shield or at least six feet from the patient and away from the useful beam. Lead aprons with at least 0.25-mm lead equivalent may be worn in place of the protective shield.

2. Patients who are in line with the primary beam and cannot be removed from the room, shall be positioned no closer than six feet from both the tube head and the nearest edge of the image intensifier. If this is not possible, patients shall be provided with a protective barrier (apron) of 0.25 mm or more lead equivalent material.

Reviewed May 2013
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