Ochsner | LSU Health SHREVEPORT	**Policy #:5.1**
SUBJECT: Radiation Protection	**Effective: 1978** **Reviewed: 10/16** **Updated: 5/19**
APPROVED BY: Radiology Director	**Page 1 of 3**

Purpose:

To define the Department of Radiology's radiation protection policies and general guidelines of radiation safety. These policies are to be considered basic safety standards that all radiation workers must observe, however some special areas such as Nuclear Medicine and Radiation Therapy require additional radiation safety standards specific to that area. These safety standards are available in specific Policy and Procedure Manuals for those areas.

Policy:

1. Employees shall utilize the cardinal principles of time, distance, shielding, and beam restriction to reduce radiation exposure. Only the required persons should be in x-ray or fluoroscopic rooms during radiographic procedures. A chaperon, if one is necessary should be placed in a low dose rate area, and provided with adequate protective shielding. If a patient must be held; the holder shall be protected with appropriate shielding devices, such as gloves and an apron. The holder will be so positioned that no part of his body will be struck by the useful beam and his body is as far as possible from the edge of the useful beam.

A. Time: Keep the time of exposure to radiation short.

All patients should be exposed to the minimum amount of radiation per examination; only the amount necessary to **obtain a diagnostic radiograph. The thickness of the body part to** be radiographed should be measured. The technologist should then refer to the technique chart prior to setting appropriate exposure factors on radiographic equipment. Exposure factors must be verified prior to exposure.

B. Distance: Maintain as much distance between the radiation source and the exposed person (yourself) as possible.

C. Shielding: Insert shielding material between the source and the exposed person (yourself).

1. When taking routine x-rays stay behind the provided lead shields.
2. Wear protective lead garments; aprons, gloves, thyroid shields when it is required to leave the protection of the lead shielded control booth or mobile lead barrier shield; for instance to assist the physician during fluoroscopic procedures.
3. As a general rule no fluoroscopy will be performed in the Radiology Department except by a Radiologist. Refer to the Fluoroscopy Policy. During fluoroscopic procedures the lead drapes shall be in place between the patient and fluoroscopist, and the Bucky slot cover shall be in place.
4. Protective knee-length aprons of at least 0.25mm lead equivalent shall be worn by each person in the fluoroscopy room, except the patient.
5. Appropriate personnel monitoring devices shall be worn outside the protective apron at the collar. If you have been assigned a second whole body badge, it should be worn at the waist underneath the protective clothing.

6. The five minute cumulative timing device must be reset before each fluoroscopic procedure. The total fluoroscopic exposure time and number of images obtained / or kerma-area-product/ or entrance skin dose shall be recorded on the RIS, which becomes a part of the patient's medical record.
7. Mobile equipment shall be used only for examinations where it is impractical to transfer the patient to a stationary radiographic installation.
8. The operator shall stand at least six feet from the patient and well away from the useful X-Ray beam.
9. When using a mobile X-Ray unit the operator should wear a protective lead apron.
10. When using mobile equipment, only the technologist and the patient are to be in the room at the time of the exposure. If the mobile unit is used in a multi bed room the useful beam shall not be directed toward other patients that may be present. Other patients should not be located closer than six feet from the tube head.

D. The useful beam SHALL be restricted (collimated) to the area of clinical interest.
E. All general radiation protective measures should be utilized routinely
F. Shielding can obscure anatomy, resulting in a repeated exam or compromise diagnostic information. Shielding placed inside the imaging field of view, or shielding that moves into the imaging filed of view, can obscure important anatomy or pathology, or introduce artifacts. In such cases, if the procedure is not repeated the interpreting physician may lack important diagnostic information; if it is repeated, here will be a substantial increase in dose. Evidence shows that this is more common problem than usually assumed.
G. Shielding can negatively affect automatic exposure control and image quality. All modern x-ray imaging systems use automatic exposure control, and the presence of shielding in the imaging field of view can drastically increase x-ray output, increasing patient radiation dose and degrading image quality.

1. The technologist and/or the student technologist SHALL NOT be permitted to hold patients during exposures except during emergencies. Refer to patient holding policy.
2. A film badge will be assigned by name and number to each employee whose duties involve routine exposure to radiation. Personnel monitoring devices such as film badges must be worn if they are to be of any value. Refer to film badge policy.
3. All doors to an x-ray room must be closed during radiographic or fluoroscopic procedures are being performed.
4. Always knock before entering a closed x-ray room. Observe warning lights which indicate that a machine is in operation.
5. A physical inspection of all protective apparel should be performed annually. Check for tears, rips, or separated shielding material. The results of the annual inspection must be recorded. An x-ray analysis should be performed on protective apparel appearing defective or questionable. The results of the annual inspection is on file in the radiology manager's office. A copy is forwarded to the RSO and/or the Radiation Safety Committee.
6. Equipment with mechanical or electrical defects should not be used. Such defects should be reported to your supervisor and an authorized service engineer contacted immediately.

7. In the event of equipment malfunction producing a known radiation hazard the main power to the equipment must be turned off. A sign must be posted on the equipment stating the equipment is not to be used. The manager must be contacted immediately, who will in turn contact the proper authorities including service engineers, the RSO, and radiation physicist. All pertinent information must be documented such as exposure settings on equipment, individuals involved, tube position, etc. and given to the radiology manager for appropriate action and distribution.
8. All radiographic equipment should be powered down and turned off when not in use. ie. end of shift, at night or on holidays.
9. No individuals shall be deliberately exposed to x-rays except for the healing arts purpose. Such exposure must be authorized by a licensed practitioner.
10. Exposure of an individual for training demonstration or other purposes unless there are also healing arts requirements and proper authorization has been provided, is specifically prohibited by law.