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ANCILLARY DIVISION APPROVAL MATRIX		Section / Department **RADIOLOGY DEPARTMENT**
Policy Title: **Radiation Protection Procedures**		Page **1** of **5**
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I. Radiation Protection Procedures

a. General Radiography

- The x-ray/radiologic technologists shall stay behind the protective barrier provided and shall observe the patient during x-ray examination.
- If two or more medical x-ray examinations are readily available given the necessary diagnostic information, then the procedure that presents the least overall risk to the patient shall be chosen.
- All medical x-ray examinations shall have results signed by radiologists.
- Requests for x-ray examination shall be signed by the referring physician and shall include the following information in legible form:
    - Patient's name, age, sex, status and address.
    - Date of request, brief clinical history and examination requested.
    - Tentative diagnosis.
    - Name of referring physician.
- It may be appropriate to modify the examination, e.g., modify or substitute with concurrence of the referring physician, in order to adopt the most appropriate strategy.
- Before beginning an examination, it is advisable to compile the existing past images of similar examinations in or outside the institution, in order to minimize the number of radiological examinations for the patient.
- Personnel should inform the patient on the correct positioning and immobilization as well as on other aspects of the examination (suspended respiration, deep inspiration, etc.)

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- It is important to assure that the radiological examination is "justified", taking into account the benefits and risks of available alternative techniques that do not involve ionizing radiation.
- The patient should wear gonadal protectors, if gonads are exposed, assuming that it does not interfere with the image.
- In case of possible fetal exposure, it is advisable to adapt the examination procedure of pregnant women, together with the radiation protection strategy and the patient's consent.
- Female patients should be asked about the possibility of being pregnant, even the young pediatric patients. If they are pregnant, appropriate measures should be taken.
- The pregnant patient or worker has a right to know the magnitude and type of potential radiation effects that might result from inutero exposure
- In order to avoid unwanted irradiation of the fetus, it is recommended to post warnings, both at the X ray room entrance and in the waiting area.
- A technique chart should be placed beside each x-ray control panel for the various projections. For manual exposures, the techniques (kVp, mA, and time) should be specified as a function of body part thickness.
- The body part of interest should be measured with a caliper when using manual exposures.
- With any equipment (manually as well as automatically controlled), it is important to know which techniques should be selected to obtain a good image.
- When changes are introduced on any component in the imaging chain (generator or tube as well as other accessory devices such as usage of grid, detectors, etc.), an update of technique settings should be carried out.

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- A yearly check of the technique charts is essential.
- It is advisable to use the highest kVp (and the lowest mAs) compatible with the image that one expects to obtain. In this way the patient dose will be minimized. Optimization should be used to find the proper balance between contrast and dose.
- Short exposure times should be used when imaging non-cooperative patients.
- Patient doses should be compared with the applicable Diagnostic Reference Levels.
- The most appropriate projection should be adopted, when the diagnostic information is not compromised.
    - For pregnant women, PA abdominal projections are preferable to minimize uterus dose
    - For skull examinations, eye lenses are better protected in PA projection
    - PA projections should be used for scoliosis imaging to minimize breast dose
- The patient should be visible from the operation control panel.
- When a change of the usual technique is needed in order to improve or maintain the image quality, it is advisable to check the performance of the complete imaging chain. Usually, the change implies an increase in patient dose.
- Equipment should be evaluated whenever it is suspected that patient doses have increased above the diagnostic reference levels.
- This evaluation should include both image quality and patient dose
- All x-ray equipment must conform to applicable standards of the Department of Health.
- **Adequate filtration** (minimum 2.5 mm Al, in general radiology), significantly reduces the patient dose due to low energy X Rays which do not contribute to the image formation.

- The use of detectors, grids, and tables of carbon fiber material, results in significant patient dose reductions.

b. Ward |ER-Tent

- Mobile x-ray machine shall be used only when it is not possible to transfer patients to fixed installations. If this were the case, the x-ray/radiologic technologists and other persons within the area shall stay at least 2 meters from the patient, the x-ray tube and the useful beam. If this is not possible, movable shields shall be provided.
- When using mobile radiographic equipment in intensive care units or in-patient rooms, high instantaneous electric power supply is needed.
- Inadequate power will result in poor quality radiographs. (For mobile x-ray machines that does not have a built-in battery)
- For the same reason, in order to avoid retakes, it is important to assure that the **battery is fully charged**.
- During the use of a mobile x-ray machine, the x-ray/radiologic technologists shall ensure that no person other than the patient will be exposed to the useful beam.
- X-ray/radiologic technologists shall not be required to hold a patient during exposure. Only the relative or companion shall be allowed to do so, provided that they wear protective lead apparels to minimize unnecessary radiation exposure.

c. CT Scan

- Have the accompanying person wear lead apron once inside the CT room.
- Use smaller FOV.
- Focus only on the part of interest.
- All female patients within child-bearing age must answer a pregnancy questionnaire / before proceeding with the procedure to avoid unnecessary exposure to foeti

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- Be sure that nobody is inside the CT room while the machine is calibrating and warming up.
- Be sure that the part of interest is free from any artifacts to avoid re-exposure.
- Check LMPs (Last Menstrual Period), especially for child-bearing patients. If the patient states that she IS pregnant, consult with the requesting physician to check if the procedure may be safely deferred. If the outcome of the decision is that the procedure is justified and must proceed due to its nature, then the requesting physician and the patient must sign a consent form for pregnant patients.