

<b>FACILITY:</b> Reading Hospital	
<b>MANUAL:</b> Organizational	<b>FOLDER:</b> Environment of Care / Radiation Safety
<b>TITLE:</b> Minimizing Patient Dose during X-ray Imaging Procedures	<b>DOCUMENT OWNER:</b> Radiation Safety Officer
<b>DOCUMENT ADMINISTRATOR:</b> Administrative Director and Department Chair	<b>KEYWORDS:</b> shielding, radiation
<b>ORIGINAL DATE:</b> 3/29/2012	<b>REVISION DATE(S):</b> 5/2014, 4/2018

**SCOPE:**

All Reading Hospital patients undergoing imaging procedures/studies using x-rays.

**PURPOSE:**

To minimize the radiation dose to patients from x-ray procedures.

**POLICY:**

- A. All Reading Hospital staff performing x-ray imaging procedures, including fluoroscopy shall follow practices and procedures outlined below to minimize patient radiation dose.
- B. Each physician/technologist shall accept responsibility for controlling and minimizing the radiation exposure to patients under his/her care.
- C. The physician/ technologist shall educate other healthcare workers and visitors by utilizing radiation safety principles such as time, distance and shielding to limit exposure to ionizing radiation.

**DEFINITIONS:**

**PROCEDURE:**

- A. **Patients Undergoing Imaging** The following are some ways to reduce patient exposure, and should be utilized as applicable:
  - 1. Minimizing repeat images
  - 2. Accurate collimation – The operator must limit the useful beam to the smallest area consistent with clinical requirements.
  - 3. Specific area shielding
  - 4. Optimal exposure factors
  - 5. Protection for pregnancy
  - 6. Use of specific procedures and auxiliary equipment to minimize patient and personnel exposure, while acquiring the needed diagnostic information
- B. **Patient Shielding in Shared Areas (ex: semi-private room)**
  - 1. Only the staff, ancillary personnel and other persons required for the medical procedure or training shall be in the room during a radiographic exposure.
  - 2. Other than the patient being examined, patient(s) who cannot be removed from the room shall be protected from the scatter radiation by protective barriers of at least 0.5 millimeter lead equivalent material unless the shield would compromise the health of the individual.

3. Other than the patient being examined, patient(s) who cannot be removed from the room shall be positioned in such a way that he/she is not in the direct line of the useful beam and if possible, the nearest portion of the body is at least 2 meters (6.56 feet) from both the tube head and the nearest edge of the image receptor. This pertains to situations such as portable imaging on the unit and in PACU.

C. **Gonadal Shielding**

1. The Department of Radiology policy states that the gonads should be shielded when they are in the path of the primary beam but not in the area of interest for diagnostic procedures. Protective shielding devices are employed based on patient's reproductive potential and the diagnostic information required.
  - a. Male patients are shielded from infancy until such time as there is no longer a reasonable potential for reproduction.
  - b. Female patients are shielded from infancy until menopause. Gonadal shielding devices in various sizes are available for use on male and female patients. Fig Leaf Gonadal Shielding Devices of various sizes specifically designed for females are available.
  - c. All Fig Leaf Gonadal Shielding Devices are made of **at least 0.5 mm lead equivalent material.**
2. When the gonads are not within the area to be imaged, lead aprons or other shielding devices of at least 0.5 mm lead equivalent material shall be used to shield the gonads of both male and female patients.
3. Special precautions shall be taken to assess whether a female patient could be pregnant. Prior to obtaining medical images via radiography, fluoroscopy, CT, or Nuclear Medicine, documentation of Last Menstrual Period (LMP) is required for patients age 11 to 55\*. Because a developing fetus is radiosensitive, pregnant women should seek a physician's advice before undergoing a radiologic examination. Any exposure to the region of the pelvis or abdomen of a potentially pregnant woman must be approved by the attending physician in consultation with the radiologist. If the patient is unresponsive or for reasons of doubt, it may be necessary to have the ordering physician order a pregnancy test.
  - a. This should not be considered an exclusive age range. The average age at which a girl begins menstruation is 12 years, according to the National Institute of Child Health and Human Development, but may occur any time between the ages of 8 and 16 years. The average age of menopause, according to the National Women's Health information Center, is 51 years, but can occur much later. Please use discretion in assessing possible pregnancy. If there are indications to suggest possible pregnancy, outside the established age range of 11 to 55, inquiry as to the patient's LMP should occur with appropriate documentation.

D. **Dental Imaging**

Because there is no collimation for dental x-ray equipment such as the Panorex, a 0.5 millimeter lead drape shall be used.

E. **Cat Scan Imaging**

No shielding is needed for adult (non-infant) CT patients for patient safety purposes. Except for the patient, anyone remaining in the room must wear at least 0.5 mm lead equivalent material. Following principles of ALARA., during portable CT, 0.5 mm lead sheets may be placed on the patient's anterior surface, above and below the region scanned to minimize staff exposure.

Reading Hospital

**GUIDELINE:**

**PROVIDER PROTOCOL:**

**EDUCATION AND TRAINING:**

**REFERENCES:**

10CFR 20: Standards for Protection Against Radiation

Behavioral and Performance Expectations Reading Hospital Human Resources Manual

<https://trh.ellucid.com/documents/view/12970>

**COMMITTEE/COUNCIL APPROVALS:**

Department of Radiology, Chair; Department of Radiology, Administrative Director; Department of Cardiac Vascular Services, Administrative Director; Radiation Safety Officer, Radiation Safety Committee

**CANCELLATION:**

The content of this document supersedes all previous policies/procedures/protocols/guidelines, memoranda, and/or other communications pertaining to this document.