

Title: Guidelines for Radiation Safety	Ref#: 1425 Ver: 7
Document Owner: Kade Price (Dir Diagnostic Imaging)	Date Approved: Not Approved Yet
Manual: Medical Imaging Medical Imaging	Next Review: 3/5/2021
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I. RADIATION SAFETY RULES

Lead aprons should be worn during all fluoroscopic examinations. Whenever it becomes necessary for a technologist to hold a patient during x-ray exposure, lead gloves and lead aprons should be worn. Lead aprons/thyroid shield integrity is done through proper QC procedures performed annually. QC is performed on all new aprons.

During an x-ray exposure the door to the hall must be closed to eliminate the possibility of exposure to any passerby as well as for privacy. The technologist should remain within the shielded area of the control panel while making an exposure.

When performing portable x-ray procedures, a lead apron should be worn by the technologist. The technologist must also remove him/herself as far as possible from the source of the radiation. Prior to the exposure, the technologists will inform those present in the room, and allow time for those not required to remain in the room during the exposure to either leave or increase their distance and location from the radiation source. Lead aprons should be worn if remaining in the room during the exposure.

Anyone accompanying a patient to a room where ionizing radiations are used, a lead apron will be worn or the individual will stand behind the shielded area. This applies to any accompanying persons or assisting personnel.

Cancer Center – The patient is the only one allowed in the treatment vault during treatment.

Nuclear Medicine – Those accompanying the patient will be discouraged from remaining in the Nuclear Medicine rooms during image acquisition to decrease potential exposure. Those who wish to remain in the Nuclear Medicine rooms during imaging acquisition will be instructed on how to reduce potential exposure.

Coning to film size or less will be carried out on every exposure; this includes portable procedures. Proper gonadal shielding is required for all patients where it is reasonable to do so.

All patients who are not responsible for their actions are not to be left alone in the x-ray rooms or waiting areas. Should any incident occur either to the patient, personnel or visitor, an occurrence report should be documented by the individual who discovered the incident. The Radiation Safety Officer (RSO) and department director are also to be informed of the incident immediately. Should any malfunction of equipment occur either electrically or mechanically, use of that room is discontinued until repaired by maintenance or service vendor. All weights and counterbalance cables are checked periodically by service vendor for wear and replaced as needed. In case of electrical problem, the machine is turned off.

Technologists must report to supervising technologist any notice of wear, malfunction or irregularity in equipment.

In case of fire, a carbon dioxide extinguisher is located in several locations for quick access from any equipment area, and the fire alarm given according to the hospital fire rules.



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Should any employee become pregnant who works where routine ionizing radiation is used, the Radiation Safety Coordinator (RSC) will be notified by the employee and the policy [Guidelines on Pregnant Females Working in Medical Imaging](#) will be observed.

All female patients of reproductive age (12YO – 50YO) are to complete and sign the *Pre-Examination Pregnancy Determination* form prior to any exam. The age range is from menses to menopause. If the question arises to the possibility of pregnancy, or it has been more than 10 days since the patient's last period, a radiologist will be consulted prior to the examination being done. The *Pre-Examination Pregnancy Determination* form will be sent to HIM and is part of the permanent medical record.

II. DOSIMETRY BADGES

All personnel having direct contact with patients who have been injected with a radioisotope or who conduct the duties and functions of their job in areas of radiation exposure will be required to wear a radiation dosimetry badge while on duty. This includes technologists, radiologists, physicians, contract workers, and all staff that assist in radiological procedures or procedures where radiation exposure occurs. Dosimetry badges for monitoring of radiation exposures are provided for personnel in medical imaging, interventional radiology, the cancer center, cardiology, biomedical services, the OR, endoscopy and others as requested.

Education on proper dosimeter badge wear-and-handling will be given to all participants upon hire. Every effort will be made to determine cumulative occupational dose by requesting exposure reports from prior or concurrent employers. All employees must be cognizant of their dosimetry badge(s), that they are used for their own protection. It is essential that we obtain true and accurate readings through their proper use as outlined in this policy.

Facility radiation film badges will be monitored monthly by Landauer, Inc. All dosimetry badges will be collected at the end of each month with replacement badges provided. It is the responsibility of the staff member or physician to switch out their film badges at the time of collection. Monthly and/or quarterly reports will be available to all monitored staff.

Whole body dosimeters (that is, when one dosimeter is worn) must be worn on the portion of the body which is likely to receive the highest dose. If a lead apron is worn, the dosimeter should be worn outside the lead apron at the collar or neck.

If two dosimeters are worn at the same time (e.g. one at the collar and one at the chest or waist under the lead apron), care must be taken to always wear the dosimeters in their correct locations. That is, the "collar" badge must always be worn at the collar and the "waist" badge must always be worn at the waist. Verify the date of use and badge-type designation when inserting into the plastic colored holders.

If a worker wears a lead apron and a thyroid shield, the badge is worn outside the apron and the shield and the dose is an "eye dose". If a worker wears a lead apron, thyroid shield and lead glasses, then the dosimeter is worn under the lead apron or thyroid shield.

A second dosimetry badge will be provided to participants working in the interventional suite and/or cath lab due to potential risk of receiving higher doses. Collar badge should be worn at the collar



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level. Waist badge is to be worn under the lead apron at waist level. The holder is to be clipped at the proper location with printed side out.

Ring badges are provided for all technologists performing nuclear medicine examinations.

All reports are reviewed by the RSO or designee monthly and reported by the Radiation Safety Committee quarterly. Reports are maintained in the Nuclear Medicine department. Any unusually high readings will be investigated immediately by the RSO or designee. Additionally, minimal or unusual doses reported for those working in areas requiring two dosimeters will be investigated. All missing or declared lost dosimeter badges due to participant failure to return or exchange will be investigated monthly and/or quarterly, depending on badge type.

If exposure readings continue to fall out of compliance, specifically those above ALARA Action Level 2, the participant will be removed from all fluoroscopic and portable procedures for a time period recommended by the RSO. Additional training in radiation safety will be given by the RSO or designee and documented prior to their returning to full scope duties.

The hospital operates under the **ALARA program**, and receives monthly and quarterly reports from the dosimetry badge company alerting us of any unusual readings.

ALARA LIMITS – PERSONNEL DOSIMETRY
(mrem / calendar quarter)

Badge / Body Part	Action Level 1	Action Level 2	Limits
Whole Body (DDE)	125	375	5000
Lens of Eye (LDE)	1500	4500	15,000
Extremities / Skin (SDE)	5000	15,000	50,000

III. LOST OR DAMAGED DOSIMETRY BADGES OR RINGS

- In the event of a lost or damaged dosimetry badge or ring dosimeter, the participant will report it to the RSO or designee.
- All lost or damaged dosimetry badges will be discussed in Radiation Safety Committee. A determination will be made to pursue further investigation and/or further actions.
- The RSO or designee will average the amount of radiation received by the individual for the previous 12 months. This average will then be submitted to Landauer, Inc. This information will be used by Landauer to update the individual's exposure record.



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IV. RADIATION SAFETY OFFICER

TO: ALL EMPLOYEES

SUBJECT: DELEGATION OF AUTHORITY

James Edlin M.D. has been appointed as the Radiation Safety Officer (RSO) and is responsible for ensuring the safe use of radiation. The RSO is responsible for managing the radiation safety program; identifying radiation safety problems; initiating, recommending or providing corrective actions; verifying implementation of corrective actions; and ensuring compliance with regulations. The RSO is hereby delegated the authority necessary to meet those responsibilities.

The RSO is also responsible for chairing the Radiation Safety Committee and assisting in the performance of its duties.

IV. PHYSICIST SUPPORT

An offsite Radiation Physicist, (Health Physics Northwest), provides the Main Campus and Women's Imaging Center with all physicist support activities. The Cancer Center contracts with Mountain States Medical Physics for physicist support. Radiation Safety surveys of all Imaging equipment is performed annually.

The Physicist is available for calculating radiation doses for given exams upon request, providing in-services on radiation and general assistance as needed.

Reference:

[EQUIPMENT CALIBRATIONS/PREVENTATIVE MAINTENANCE](#)

[Hazardous Materials & Waste Management Plan \(300 Series\)](#)