

Policy and Procedures
For
X-ray Use in Animal Research

Approved by the Creighton University

Radiation Safety Committee

March 6, 2019

Animal research protocols may require the use of x-ray radiation. The following guidelines have been developed and approved by the Creighton University Radiation Safety Committee to help ensure the safety of operators and the animal caretakers assisting in x-ray procedures performed on animals in research.

The Principle Investigator on a protocol using x-ray radiation in animal research is responsible for ensuring the compliance with the administrative requirements of this Policy. All faculty, research assistants, post-doctoral fellows, staff and others engaged in procedures using x-ray radiation in animal research must comply with applicable individual requirements.

1. General Information

- a. Machines capable of generating ionizing radiation must be registered annually with the Nebraska Department of Health and Human Services (DHHS). The Radiation Safety Office will process these registrations. The Principle Investigator must notify the Radiation Safety Office of any new equipment or disposal of obsolete equipment in a timely manner (i.e., notification must occur prior to the procurement of new equipment or disposal of obsolete equipment).
- b. The Radiation Safety Office will review the facility, the equipment, and records of use on an annual basis. Advance notice will be provided. Users must cooperate in making the facilities and staff available. Nebraska Department of Health and Human Services may inspect at any time, with or without notice. The Principle Investigator will immediately contact the Radiation Safety Office if an inspection by NDHHS is scheduled or occurs without notice. The Principle Investigator will report to and collaborate with the Radiation Safety Office to correct any non-compliance found on inspection and will ensure that the non-compliance is corrected within the timeframe given in the inspection documentation.
- c. No individuals under the age of 19 may participate in any x-ray procedure.

2. Dosimetry

- a. All individuals participating in any part of an x-ray procedure must be wearing a dosimeter that has been assigned to them. Dosimeters are designed to measure the radiation exposure received by an individual; they do not provide any protection from radiation. Each individual will be assigned a whole body badge. The Radiation Safety Officer (RSO) will determine if a ring badge is necessary. These are exchanged bi-monthly.
 - i. In order to receive a dosimeter, training must be documented as described in the following sections.
 - ii. A badged individual must never wear anyone else's badge or allow anyone else to wear his or her badge.
 - iii. A badged individual must ensure that his or her name is visible on the outside of the badge. This ensures that the orientation of the badge is correct and prevents erroneous readings.

- b. Proper use and storage of the badge
 - i. A badged individual must wear the whole body badge outside of any protective lead shielding.
 - ii. An individual assigned a ring badge must wear it on his or her dominant hand and under protective and/or lead lined gloves.
 - iii. A badged individual must wear the badge only when working with the x-ray procedures. This dosimeter is designed to measure occupational exposure to radiation and should never be worn outside of Creighton University.
 - iv. A badged individual must make every attempt to prevent damage to the badge. Extreme temperatures or water may damage the integrity of the badge.
 - v. Badges must be stored away from the x-ray equipment when not being worn.
 - vi. Lost or missing badges may be replaced by talking to the staff in the Radiation Safety Office.
 - vii. Each department will have an assigned badge coordinator who will provide individuals with new badges and return the old badges to the Radiation Safety Office. If an individual does not know who the badge coordinator is, he or she may contact the Radiation Safety Office.

- c. Declared pregnant workers will be issued a fetal monitor
 - i. The declaration of pregnancy form can be found at the Radiation Safety website under the Research Compliance site.
 - ii. Declaring a pregnancy is completely voluntary
 - iii. The fetal monitor is to be worn under any leaded aprons and is exchanged on a monthly basis.

3. Safety Precautions

- a. Protective clothing such as leaded aprons, glasses, thyroid collars, gloves are to be worn by staff except in the following situations:
 - i. Personnel who are completely behind a protective barrier when the equipment is energized.
 - ii. When a radiation protection survey shows the exposure rate in an occupied area is less than 5mR/hr when the equipment is energized, and the individuals are wearing dosimeters.

- b. Only personnel whose presence is necessary shall be permitted in the radiographic area during an exposure. Unnecessary personnel must leave the room while the exposure occurs.

- c. No person will routinely hold animals during an x-ray procedure. Sandbags, V-troughs, slings or other ancillary devices should be used to position the animal. If an animal must be held, the individual assigned must wear protective gloves and apron, and must remain outside of the useful beam.

- d. No part of an individual's body shall be exposed to the useful x-ray beam.
- e. Entrances to the radiographic facilities shall be restricted when performing any x-ray procedures.

4. Training

- a. All individuals who operate x-ray equipment while conducting research with animals must document initial x-ray training.
 - i. Individuals must successfully complete the Creighton University X-ray training and quiz.
 - ii. Any individual who is not a Nebraska-licensed physician, physician's assistant, nurse practitioner, medical radiographer, or veterinarian must document supervised training that is appropriate to that piece of equipment. A minimum of 5 hours of proctored use of the x-ray equipment is required. The proctor must be authorized to use the equipment, must be current on annual training, and must sign the documented training form certifying the person had demonstrated competence in the following:
 - 1. Identification of radiation hazards associated with the use of the equipment;
 - 2. Significance of the various radiation warning and safety devices, and interlocks incorporated into the equipment, or the reasons they have not been installed on certain pieces of equipment and the extra precautions required in such cases;
 - 3. Proper operating procedures for the equipment;
 - 4. Recognition of symptoms of an acute localized exposure;
 - 5. Proper procedures for reporting an actual or suspected exposure; and
 - 6. Radiation protection commensurate with the hazards of the device.
- b. Annual x-ray refresher training is required for all individuals who participate in x-ray procedures involving animals. All individuals assigned a dosimeter are required to complete this training.

5. Emergency contacts

- a. The Radiation Safety Office is open Monday through Friday, 8:00-4:30, excluding University holidays. Staff can be contacted at 402-280-5570.
- b. In the event of an after hours situation requiring immediate attention, emergency contact information is available on the voicemail of the Radiation Safety Office telephone number.