RADIATION SAFETY

Overview

The Health Science Center has been issued a broad-scope radioactive material use license by the Texas Department of State Health Services (DSHS), Radiation Control Program permitting the Radiation Safety Committee to issue and withdraw authorizations for using radiation sources at the Health Science Center. Before a Principal Investigator may acquire any quantity of radioactive material, any radiation-producing device, or laser whether by purchase, loan, or gift, the Radiation Safety Committee must approve an application for its use.

Use of Radioactive Materials

An authorized user is a person who, by virtue of position, training and experience, is permitted by the Radiation Safety Committee to hold a “sub-license” of the Health Science Center broad-scope license. This authorization permits the purchase and use of radioactive materials under the supervision of the authorized user, provided that the materials are used within the submitted protocol guidelines and Radiation Safety Handbook.

The Radiation Safety Committee or the Radiation Safety Officer (RSO) may suspend or withdraw authorization to possess and use radioactive material for failure to observe and comply with any condition of the authorization or the Radiation Safety Handbook.

The RSO is responsible for investigating incidents and monitoring and implementing policies relating to radiation safety. The RSO is the Radiation Safety Committee’s representative regarding radiation protection at the Health Science Center. Any changes relating to an authorized user’s protocol must be related to the Radiation Safety Division in writing. These amendments may include possession limits, laboratory location, personnel changes, and the termination of work.

Responsibilities

Radiation Safety Officer (RSO) The Radiation Safety Officer is responsible for:

1. Reviewing all proposals for use of radioactive sources and recommending action to the Radiation Safety Committee and the
Radioactive Drug Research Committee.

2. Inspecting facilities and equipment through radiation safety evaluations and monitoring all facilities in which radioactive material is used, or radiation-producing equipment resides.

3. Prescribing special conditions and requirements as may be necessary for safe and proper use of all radiation sources in the Health Science Center research, education, and patient care.

4. Acting as consultant in the design of all new facilities using radioactive material for the purpose of providing protection against radiation exposure.

5. Preparing and disseminating information on radiation safety for faculty, staff, and students as necessary.

6. Authorizing, receiving, storing, and processing incoming radioactive material orders.

7. Supervising, packaging, monitoring and recording the disposal of radioactive waste.

8. Providing personnel monitoring services, including the reviewing and recording of commercially processed dosimeter reports.

9. Performing six (6) month leak testing on all non-exempt registered sealed-sources.

10. Completing or providing internal dose assessment in accordance with the conditions of the University's license or when ingestion of radioactive materials is suspected.

11. Executing environmental surveys as required.

12. Preparing license applications, amendment applications, and required reports as well as acting as the primary contact for correspondence with state radiation control authorities on a timely basis.

13. Investigating incidents involving radiation exposures including overexposures, incidents, theft, loss of sources, and accidents.
14. Notifying the Texas Department of State Health Services of all reportable incidents including overexposures, theft, loss of sources and submitting reports as required.

15. Reacting to any situation that is imminently dangerous to life and health and/or not in compliance with regulatory standards or University policy. Corrective actions shall include the authority to stop or shut down use of radiation sources until the situation is deemed safe by the Radiation Safety Officer.


17. Directing and supervising emergency response and decontamination efforts.

18. Ensuring that radiation doses are maintained as low as reasonably achievable (ALARA).

19. Maintaining records of the radiation protection program.

**Radiation Safety Division** The Radiation Safety Division, under the direction of the Radiation Safety Officer is responsible for:

1. Conducting safety evaluations of facilities and equipment through performing radiation surveys and monitoring all facilities in which radioactive material is used, or radiation-producing equipment resides. Surveys include contamination and record checks.

2. Authorizing orders, receiving, storing, processing, and dispensing radioactive material, and maintaining records on all of the preceding transactions.

3. Supervising, packaging, monitoring and recording the disposal of radioactive waste.

4. Performing semi-annual leak testing on all non-exempt registered sealed-sources.

5. Performing or providing internal dose assessment in accordance with the conditions of the University's license or when ingestion of radioactive materials is suspected.
6. Performing environmental surveys as required.

7. Reacting to any situation that is imminently dangerous to life and health and/or not in compliance with regulatory standards or University policy. Corrective actions shall include the authority to stop or shut down use of radiation sources until the situation is deemed safe by the Radiation Safety Officer.

8. Performing emergency response and decontamination efforts.


**Principal Investigator** Principal investigators are responsible for obtaining the required radioactive material authorization and ensuring that individual responsibilities are properly carried out. Every principal investigator is responsible for:

1. Adequate planning. Before experiments are performed, the Principal Investigator should determine the types and amount of radiation or radioactive material to be used. This generally indicates the protection required. A written procedure involving the use of radioactive material should be outlined. In any situation where there is an appreciable radiation hazard, the Radiation Safety Office should be consulted before proceeding.

2. Instructing employees in the use of safe clinical and laboratory techniques.

3. Ensuring that all persons using radioactive material under their authorization are familiar with and comply with radiation safety policies outlined in the *Radiation Safety Handbook*.

4. Furnishing the Radiation Safety Office with information concerning individuals and activities in their areas:
   a. Personnel changes
   b. Laboratory location changes
   c. Any major changes in operational procedures and new techniques
d. Any alterations in the laboratory (e.g., the removal of radiochemical fume hood) that are anticipated.

5. Complying with the applicable regulations and policies governing the safe use of radioactive materials. These are:

   a. Maintaining proper procedures for the procurement of radioactive materials by purchase or transfer.

   b. Posting areas containing radiation sources with signage necessary to notify personnel of the hazard with appropriate signs where radioisotopes are kept or used, or where radiation fields may exist.

   c. Recording the receipt, use, transfer, and disposal of radioactive materials in their area. This includes sealed sources, such as ion sources in gas chromatographs, static eliminators, and liquid scintillation counters.

   d. Ensuring appropriate security of all radiation sources under their authority.

   e. Assuring that all radioactive waste materials are consigned to the Environmental Health and Safety Radiation Safety Office for disposal.

   f. Ensuring contamination surveys are performed at the necessary frequency and maintaining a written record of the survey results.

   g. Having all records available for inspection by the Radiation Safety Office or the Texas Department of State Health Services during normal working hours including the current copy of the Radiation Safety Handbook in each laboratory where radiation sources are being used or stored.

   h. Ensuring that radiation doses are maintained as low as reasonably achievable.
i. Following emergency procedures outlined in the *Radiation Safety Handbook*.

j. Ensuring that the appropriate personal protective equipment is worn by all laboratory personnel.

k. Following the policy of no eating, drinking, smoking, or applying cosmetics in the laboratory.

l. Labeling all radiation sources properly.

6. Requiring that all personnel attend mandatory radiation safety training.

7. Complying with proper procedure upon termination of association with the Health Science Center. Particular care should be exercised to see that specialized equipment, such as personnel monitoring devices, (e.g. dosimeter badges), survey instruments, and shielding materials are returned to the Radiation Safety Office.

**Individual Faculty, Staff and Students** All personnel at the Health Science Center and University Health System are expected to follow these responsibilities:

1. Wearing personnel dosimeters when appropriate based on the radiation risk.

2. Utilizing all appropriate laboratory measures including:
   
   a. Wearing all appropriate personal protective equipment including gloves, eye protection, and laboratory coats.
   
   b. Not wearing shorts or open toed shoes within the laboratory.
   
   c. Using protective barriers and other shields when possible.
   
   d. Using mechanical devices whenever their aid will reduce exposure.
e. Pipetting with mechanical devices only – never pipette radioactive solutions by mouth.

f. Performing radioactive work within the confines of an approved hood, unless serious consideration has indicated the safety of working in the open. All iodinations and handling of unbound radioiodine solutions are to be carried out in an approved chemical fume hood.

g. No smoking, drinking, eating or applying cosmetics permitted in radioisotope laboratories.

h. Maintaining personal safety by not working with radioactive materials if there is a break in the skin and washing hands upon completion of radioactive material use.

i. Checking the immediate radioactive material work areas, e.g., hoods, benches, etc., according to Chapter 8.3.2 of the Radiation Safety Handbook, for contamination. A record should be maintained of these surveys, including results which are entirely negative. Any contamination observed should be cleaned, resurveyed, and actions recorded.

j. Keeping the laboratory neat and clean. The work area should be free from equipment and materials not required for the immediate procedure.

k. Keeping or transporting materials in such a manner as to prevent breakage or spillage (double container), and to ensure adequate shielding.

l. Keeping work surfaces covered with plastic backed absorbent material to limit and collect spillage in case of accident.

m. Labeling and isolating radioactive waste.

n. Labeling equipment, used for radioactive material, such as glassware and pipetters. Once used for radioactive
substances, equipment should not be used for other work.

o. Contaminated equipment shall not be sent from the area to central cleaning facilities, repair shops, or to surplus, until demonstrated to be free of contamination.

p. Requesting Radiation Safety Office supervision of any emergency repair of contaminated equipment in the laboratory by shop personnel or by commercial service contractors. At no time shall servicing personnel be permitted to work on equipment in radiation areas without the presence of a member of the laboratory staff to provide specific information.

q. Immediately reporting accidental inhalation, ingestion, or injury involving radioactive material to his supervisor and the radiation safety office and carrying out their recommended corrective measures. The individual shall cooperate in any and all attempts to evaluate his exposure.

r. Carrying out decontamination procedures when necessary, and taking the appropriate steps to prevent the spread of contamination to other areas.

s. Complying with requests from the Radiation Safety Office for body burden measurements of the thyroid and the submission of urine samples for radioassay.

3. Ensuring that security procedures outlined in the Radiation Safety Handbook are followed.

4. Complying with proper procedure when terminating employment or the use of radioactive materials or radiation.