

## **Radiation Safety**

- The following pertains to laboratory personnel who collect, transport, analyze patient specimens, or handle reagents that contain radioactive materials.

### **1. Personnel Exposure**

- Radioactive sources can include liquids or solids that release radiation above normal background levels. Solids are most likely to be encountered in prostate specimens. See Pathology policy on handling prostate seeds. Seeds must not be handled until cleared by Safety Management Services.
- Patients who receive radioactive substances for testing/treatment generally have low levels of radioactivity. The Nuclear Regulatory Commission (NRC) has determined the risk to be low in these specimens. Although radioactivity may be detected, the radiation dose is insignificant.
- Excretion of radioactive substances occurs mainly through urine, saliva, and perspiration. Therefore, higher levels of radiation are detected in these specimens, the most being urine and blood.

### **2. Radioactive Exposure**

- The level of exposure to radioactive sources is influenced by the level of activity of the source, distance to the source, and exposure time.
- Universal precautions are required for radioactive patient specimens. Special handling precautions are not required, unless specifically stated on a case by case basis.

### **3. Collection of Specimens**

- Universal precautions are required for collecting specimens.
- Adhere to instructions posted on patient's door.
- In general, NO SPECIMENS or BLOOD DRAWS should be collected by Pathology staff for patients with a "Caution Radioactive Material" sign on the door. Nurses are responsible for the collection and hand delivery of these specimens to Pathology.
- If options of collection by personnel other than Pathology staff are exhausted, the duration of patient contact should be limited to the minimal amount of time necessary to perform patient care duties.
- Biologic specimens may be collected by Pathology staff after approval by Nuclear Medicine. Specimens must be labeled with radioactive material stickers and hand delivered to Pathology.
- Gloves should be put on before entering the room.

- While in the room shoe covers, gloves, and other personal protective equipment that are determined to be necessary as defined by door signs should be worn. Upon exiting, PPE MUST be discarded into containers marked for radioactive waste within the patient's room.
- A clean sink outside of the patient's room should be used for hand washing.
- Pregnant personnel should not have contact with individuals receiving radioactive therapies. See UM Declared Pregnant Worker Policy available from Safety Management Services.

#### **4. Transport of Specimens**

- Specimens from patients receiving therapy (i.e. Bexxar) must be hand carried to the laboratory. The pneumatic tubes should not be used for transport of these specimens.
- Due to the low level of radiation present in a patient's specimen no special radioactive precautions are required for transport to the laboratory.
- Direct handling of specimens should only occur while wearing gloves, and adhering to Universal Precautions.

#### **5. Specimen Disposal**

- Specimens that have been labeled as radioactive should be disposed of in 5-gallon radioactive waste buckets after analysis. These buckets are located in the Chemical Pathology area.

#### **6. Radioactive Reagents**

- See the Department of Pathology Chemistry Section Radiation Safety for details of handling and disposal of radioactive materials used during testing.
- Chemistry has barrels for disposal of liquid and solid Iodine-125 waste. Other forms of radioactive waste require separate disposal barrels.

#### **7. Radiation Warning Signs and Labels**

- All areas or rooms where radioactive materials are being used or stored will post the appropriate approved warning and prohibition signage to indicate the presence of radioactive materials.



- Appropriate radioactive warning labels will be placed on all containers of radionuclides and waste containers, and shipping containers as mandated via the Department of Transportation and U.S. Nuclear Regulatory Commission.

## 8. Radioactive Spills

- Notification to a chief technologist, supervisor, senior clinical tech, or director should happen after a spill has occurred. Safety Management Services-Radiation Safety Service must be notified if spills occur on the floor or are identified on laboratory personnel.
- Use the following PPE: double gloves, safety glasses, and lab coat.
- Contain the spill by covering with absorbent material.
- Working from the edge wipe towards the center of the spill.
- Carefully clean using Isoclean solution.
- After cleaning the spill, take a smear using a cotton swab and perform a count of the swab using a Geiger counter.
- Counts should be  $\leq 3X$  background. Background is measured using a clean cotton swab as a comparison.
- Counts that are  $\geq 3X$  background should have a blue pad placed over the area with the plastic side facing up. "Caution Radioactive Material" tape should be placed on the pad.
- Smears of the area should be tested weekly until counts are below  $3X$  background.

## 9. Contacts

**Table 1: Contacts**

Contact	Reason for Contacting	Phone Number
OSHA (Occupational Safety and Environmental Health)	Radioactive solid and liquid waste pickup	647-1143 3-4568
Safety Management Services - Radiation Safety Service	Radiological spills or questions	764-4427 764-6200
Department of Public Safety	After hours radiological spills	763-1131 or 911
Safety Management Services - Radiation Safety Service	Declared Pregnant Worker Policy	764-4294

## References

Clinical Radiation Safety Procedures. 2006. (Accessed November 2, 2007, at <http://www.safety.duke.edu/RadSafety/manual/chap11.asp>).

Pathology Department. Radiation Safety in Chemical Pathology. University of Michigan Hospital; 2002.


[10 CFR 20. Standards for Protection Against Radiation. 2003.](#)

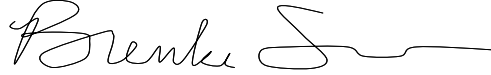
[UMHHC Policy 05-03-029 Radiation Monitoring Dosimeter.](#)

Occupational Safety and Environmental Health (OSEH)  
<http://www.oseh.umich.edu>

Nuclear Regulatory Commission (NRC). <http://www.nrc.gov/>.

NCCLS. *Clinical Laboratory Safety; Approved Guideline—Second Edition.*  
Document GP17-A2 (ISBN 1-56238-530-5).

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