



This is Chapter 6, part-two of the Radiation Safety Short Course: Radioisotope Laboratory Techniques. In this section we will review what Radiation Safety personnel evaluate when completing the quarterly laboratory inspections and what is expected of you, the authorized user of radioactive material.

OBJECTIVES

To provide you with the information to work smarter and safer!

To fulfill the requirements of the University of Florida's Radioactive Materials license.

Our goal here at Radiation Safety is to provide you, the authorized radioactive material user, with the information to work smarter and safer! In doing this we are also fulfilling the requirements set forth by the University of Florida's Radioactive materials broad-scope license.

LAB SAFETY CHECKLIST

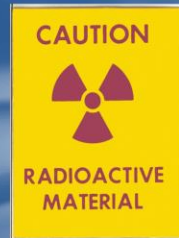
- Complete Radiation Safety Inspection
- Quarterly
- Swipe survey
- Lists any deficiencies

Radiation Safety personnel complete quarterly inspections of all active labs that are approved for use of radioactive material. During these inspections swipe surveys are completed, forms are reviewed and general laboratory safety is observed. Any deficiencies will be noted on the quarterly inspection report sent to the PI.

LAB SAFETY CHECKLIST

Caution Signs

- Doors
- Hoods
- Hardware
- Work Areas
- Refrigerators / Freezers
- Waste Areas



Radiation Safety inspectors will ensure entryways, work areas and storage areas are appropriately posted. If work is done in hoods, these too must be labeled as work areas. All hardware, refrigerators, freezers and coolers must be labeled if used for radioactive material use or storage. Waste areas must also be properly posted to ensure they are not emptied inappropriately.

LAB SAFETY CHECKLIST

Caution Signs

- Doors
- Hoods
- Hardware
- Work Areas
- Refrigerators / Freezers
- Waste Areas



This is an example of the appropriate Radioactive Material Work Area posting. Ensure this posting is clearly visible in all work areas designated for radioactive work. Be aware of these areas in all labs.

LAB SAFETY CHECKLIST

Caution Signs

- Doors
- Hoods
- Hardware
- Work Areas
- Refrigerators / Freezers
- Waste Areas



All refrigerators, freezers, coolers and/or cold rooms in which radioactive material is stored must be properly posted. Please remember, do not under any circumstance store food, party supplies, or beverages in any of these units!

LAB SAFETY CHECKLIST

Caution Signs

- Doors
- Hoods
- Hardware
- Work Areas
- Refrigerators / Freezers
- Waste Areas



This is an example of the appropriate Radioactive Waste posting. Remember that rad waste must remain segregated. Liquid waste should never be mixed with solid waste or vice versa. In Chapter 7 radioactive waste will be covered and you will be instructed on how to store waste appropriately.

LAB SAFETY CHECKLIST

Required Postings

- Emergency Spill Procedures
- Notice to Employees
- Emergency Notification
- Laboratory Safety Rules

RADIOACTIVE MATERIAL SPILL EMERGENCY PROCEDURES RESEARCH LABORATORIES	
I. MINOR SPILLS: Less than 100 microcuries of activity and/or 5 mCi/hr at 1 foot	
A. NOTIFY	Notify individuals in the area that a radioactive spill has occurred.
B. PREVENT THE SPREAD	Cover the spill with absorbent paper.
C. CALL FOR HELP	Report incident to the Radiation Control Office (302) 902-7109 or (302) 902-1540. If possible, have someone not involved in the spill make the report. In the event the Radiation Control Office cannot be reached, utilize the Emergency 911 or 911x4444.
D. CLEAN UP	Use disposable gloves and long-handling tools for high energy beta's and gamma's. Do not spread contamination to new absorbent paper and carefully wipe spill from outside to inside. Insert into a plastic bag and discard. All waste in a radioactive waste container include all other contaminated materials such as spillable gloves.
E. SURVEY	If using an instrument other than a low energy beta monitor, use a survey meter and check the area around the spill, your hands, shoes, and clothes for contamination. A wipe survey should be performed to determine that decontamination results are below the University of Illinois limit of 100 dpm/100 cm ² .
II. MAJOR SPILLS: More than 100 microcuries of activity or 5 mCi/hr at 1 foot or personal contamination	
A. CLEAR THE AREA	Notify all individuals not involved in the spill to vacate the room. These people shall not return to the room to be checked for contamination.
B. PREVENT THE SPREAD	Cover the spill with absorbent material, but do not attempt to clean it up. Confine the movement of all potentially contaminated personnel to prevent the spread.
C. CALL FOR HELP	Notify the Radiation Control Office (302) 902-7109 or (302) 902-1540 immediately. If possible, have someone not involved in the spill make the notification. In the event the Radiation Control Office can't be reached, utilize the Emergency Call List (below).
D. SHUT DOWN SOURCE	Shut off the spill if possible, but only if it can be done without further contamination or without significantly increasing your radiation exposure.
E. CLOSE THE ROOM	Leave the room and lock the door to prevent entry. Post a sign "CONTAMINATION, DO NOT ENTER Until Cleared by Radiation Control."
F. PERSONNEL DECONTAMINATION	Contaminated clothing should be removed and then moved for evaluation by the Radiation Control Office. If the spill is on the skin, flush thoroughly and then wash with mild soap and lukewarm water. Proceed to decontamination and survey under the direction of a Radiation Control Office representative.
G. FACILITY DECONTAMINATION	• Upon direction of the Radiation Control Office, proceed to clean up spill and survey as to I.E. and L.E. follow-up. • When possible, should be used to prevent personal contamination. • Both body and personal hygiene may be required.
RADIATION CONTROL DEPARTMENT EMERGENCY CALL LIST (Call in order and as soon as possible)	

Each authorized lab is required to have four postings visible to authorized radioactive material users. These postings include: 1. radioactive material spill emergency procedures of research laboratories. This will provide the user with minor spill procedures, major spill procedures, and most importantly, office and cell phone numbers for Radiation Control personnel. Continue calling these numbers until you reach someone.

LAB SAFETY CHECKLIST

Required Postings

- Emergency Spill Procedures
- Notice to Employees
- Emergency Notification
- Laboratory Safety Rules

DEPARTMENT OF HEALTH
NOTICE TO EMPLOYEES
STANDARDS FOR PROTECTION AGAINST RADIATION, NOTICES,
INSTRUCTIONS AND REPORTS TO WORKERS; INSPECTIONS

THE DEPARTMENT OF HEALTH HAS ESTABLISHED STANDARDS FOR PROTECTION
AGAINST RADIATION HAZARDS IN CHAPTER 64E5, FLORIDA ADMINISTRATIVE CODE.

YOUR EMPLOYER'S RESPONSIBILITY
Your employer is required to:

1. Apply these regulations to work involving sources of radiation.
2. Post or otherwise make available to you a copy of the Department of Health regulations, and the operating procedures which apply to work you are engaged in, and explain their provisions to you.
3. Post or otherwise make available to you Notice of Violation involving radiological working conditions, proposed imposition of civil penalties and orders.

YOUR RESPONSIBILITY AS A WORKER
You should familiarize yourself with those provisions of the Department of Health regulations, and the operating procedures which apply to the work you are engaged in. You should observe these provisions for your own protection and protection of co-workers.

WHAT IS COVERED BY THESE REGULATIONS

1. Limits on exposure to radiation and radioactive material in research and commercial areas.
2. Standards to be taken after accidental exposures.
3. Personnel monitoring, surveys, and equipment.
4. Control signs, labels, and safety instruction equipment.
5. Exposure records and reports.
6. Options for workers regarding Department of Health inspections.
7. Retired workers.

REPORTS ON YOUR RADIATION EXPOSURE HISTORY
The Department of Health regulations require that your employer give you, in written report if you receive an exposure in excess of any applicable limit set forth in the regulations or in the license. This limit for exposure to employees are set forth in Part 121 of the regulations.

These sections specify limits on radiation exposure and exposure to concentrations of radioactive materials in air.

If you work where personnel monitoring is required:

1. Your employer must give you a written report of your radiation exposure when you terminate your employment.
2. Your employer must give you a written report of your radiation exposure annually.

INSPECTIONS
All licensed and regulated activities are subject to inspection by representatives of the Department of Health. In addition, any worker or worker representative who believes that there is a violation of Chapter 64E, Florida Statute, Chapter 64E-5, Florida Administrative Code, or the terms of the employee's license or inspection regarding radiological working conditions in which the worker is engaged, may request an inspection by contacting the Bureau of Radiation Control, 1117 Wisconsin Boulevard, Tallahassee, Florida 32310-3700 (904) 487-1004. The request must set forth specific grounds for the inspection. During inspections, Department of Health inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he believes contributed to or caused any violation as discussed above.

(Copies of Chapter 64E-5, F.A.C., radioactive materials license, the operating procedures, notice of violation involving working conditions or penalty orders issued and responses thereto may be obtained at:

Environmental Health and Safety Division
Radiation Control and Radiological Services
212 Nuclear Sciences Center

POSTING REQUIREMENT
COPIES OF THIS NOTICE MUST BE POSTED IN SUFFICIENT NUMBER OF PLACES IN EVERY ESTABLISHMENT WHERE EMPLOYEES ARE ENGAGED IN ACTIVITIES LICENSED OR REGISTERS AS SPECIFIED BY CHAPTER 64E-5, FLORIDA ADMINISTRATIVE CODE, OF THE DEPARTMENT OF HEALTH, TO PERMIT EMPLOYEES WORKING IN OR PASSING ANY PORTION OF A RESTRICTED AREA TO OBSERVE A COPY ON THE WAY TO OR FROM THEIR PLACE OF EMPLOYMENT.

HS-000, Edition 02/07, Replaces HS-000 (Rev. 05/96)

The second posting required to be readily visible in authorized labs is the Department of Health Notice to Employees. This posting is required by the State of Florida and provides the authorized user is information on what is expected of UF as the employer and what is expected of you as the worker.

LAB SAFETY CHECKLIST

Required Postings

- Emergency Spill Procedures
- Notice to Employees
- Emergency Notification
- Laboratory Safety Rules

In The Event Of Accident,
Damage, Loss, Theft, Spill, Or
Contamination Involving

RADIOACTIVE MATERIALS

**IMMEDIATELY
NOTIFY**

		Telephone Number
Licensee's Radiation Safety Officer:	Duty	352-392-7359
Susan E. Stanford	After	
	Duty	352-260-3133

For State Radiation Emergency
Notification or Assistance Call:

(407) 297-2095*
*Monitored 24 hours a day

In the event of suspected contamination:

1. SEAL OFF CONTAMINATED AREA. CLOSE WINDOWS, DOORS, AND VENTILATION TO OTHER AREAS.
2. LIMIT ACCESS TO CONTAMINATED AREA. KEEP PEOPLE OUT!
3. DO NOT TRACK RADIOACTIVITY THROUGHOUT THE BUILDING. REMEMBER YOUR SHOES AND CLOTHING MAY BE CONTAMINATED!

HEALTH
State of Florida
Department of Health
Bureau of Radiation Control
6075 South Orange Ave., RM. 4012
Orlando, Florida 32839-1741

The third posting, also required by the State of Florida, is that which provides a 24-hour contact number for State Emergency officials in the event of an accident, damage, loss, theft, spill or contamination involving radioactive materials. Immediate notification of the Radiation Safety Officer is required and their contact numbers are also provided.

LAB SAFETY CHECKLIST

Required Postings

- Emergency Spill Procedures
- Notice to Employees
- Emergency Notification
- Laboratory Safety Rules

SAFETY RULES FOR A RADIOISOTOPE LABORATORY

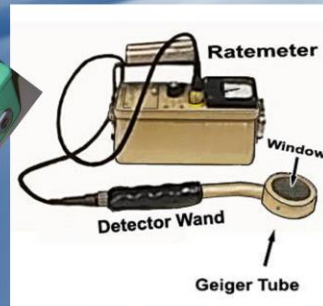
1. No smoking, eating, drinking, application of cosmetics, or storage of food is permitted in the area where radioactive materials are used or stored.
2. Personal belongings (books, purses, and clothing) must not be placed on laboratory work benches.
3. Maintain good housekeeping at all times. Label all containers (beakers, test tubes, etc.) as to radioisotope, activity and date.
4. Always line trays, benches, and hoods with absorbent paper before using radioactive material. This will help to confine spills and facilitate easy decontamination.
5. No pipetting of radioactive materials is to be done by mouth; use a syringe, propipettor, or other remote control device.
6. Use plastic or rubber gloves whenever handling radioactive material; remove gloves before leaving the area where radioactive material is being used to prevent spread of contamination. Other protective clothing (lab coats, goggles, etc.) should be worn when necessary.
7. Before leaving the laboratory always wash and then monitor your hands with the appropriate survey meter.
8. Shield all hard beta and gamma emitting isotopes to an exposure dose rate below 2 mR/hr at 1 foot. Use long handled equipment when working with highly radioactive materials.
9. Wear your film badge at all times while working in the laboratory. A film badge should be worn on the chest.
10. All radioactive waste should be collected in suitable containers. These containers shall be labeled "CAUTION - RADIOACTIVE MATERIAL" and must show the isotope, amount, date and Principal Investigator's name.
11. All injuries occurring while handling radioactive materials shall be monitored for contamination.
12. Radioactive material shall be used and stored in such a manner as to prevent unauthorized persons from using or removing such material.
13. Report all spills and other incidents to the Radiation Control Office immediately.

The fourth posting is that which provides thirteen safety rules for radioisotope laboratories. All authorized users should review these rules frequently. It is easy to become too relaxed when performing the same routine over and over. Don't let you guard down, always strive to work safer and smarter!

LAB SAFETY CHECKLIST

Survey Instruments

- Battery Check
- Calibrated within the last 9 months?
- Proper meter for isotopes in use?
- Is LSC information the same as last inspection?



Radiation Control inspectors will check survey meters to ensure batteries are functioning properly, that they have been calibrated within the last 9 months, and ensure the lab is using the proper meter for the isotopes being used. The inspector will also verify the use of liquid scintillation counters and whether or not there are any changes since the previous inspection.

LAB SAFETY CHECKLIST

Waste Areas

- Properly Shielded?
- Properly Segregated?
- Stored properly?
- Are appropriate catchtrays under liquids?

Radiation Control inspectors will inspect waste storage areas to ensure they are properly shielded, properly segregated and that the appropriate catch trays are situated under liquid waste containers. It will be noted if funnels have been left in the waste containers so please ensure the funnels are placed in the appropriate location when transfer of liquid waste is complete.

LAB SAFETY CHECKLIST

Protective Clothing

- Lab coat?
- Appropriate gloves?
- Eye protection?



Inspectors will be observing if protective clothing is being worn appropriately. Lab coats, gloves and eye protection must be worn when working with radioactive material. Remember, work safer and smarter! Change gloves frequently to prevent cross contamination and always wash your hands frequently!

ALARA

- As Low As Reasonably Achievable
 - How?
 - Time
 - Distance
 - Shielding
 - Why?
 - Minimize Dose

The guiding principle behind radiation safety is ALARA, As Low As Reasonably Achievable. We achieve this through effective use of time, distance and shielding. Why do we do this, in order to minimize dose to the user.

TIME

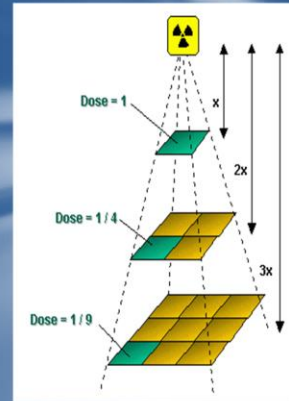
- Less time = Less radiation exposure
- Use radioactive material only when necessary
- Dry runs (without radioactive material)
- Identify portions of the experiment that can be altered in order to decrease exposure times
- Shorten time when near radioactive material
- Obtaining higher doses in order to get an experiment done quicker is NOT "reasonable"!

The less time you work with radioactive material guarantees less radiation exposure. So use radioactive material only when necessary. Dry runs are an effective use of time. While completing dry runs you may be able to identify portions of the experiment that can be altered in order to decrease potential exposure. Try to always be conscious of the amount of time you are working with radioactive material. Remember, obtaining higher doses in order to complete an experiment quicker is NOT reasonable!

Only remove radioactive material from its storage container when you are ready to use it, thereby lessening your time for exposure. Remember, obtaining higher doses in order to get an experiment done quicker is not a reasonable option!

DISTANCE

- Effective & Easy
- Inverse Square Law
 - Doubling distance from source, decreases dose by factor of four
 - Tripling it decreases dose nine-fold
- More Distance = Less Radiation Exposure
- Tongs, Tweezers, Pipettes, Pliers



Maximizing your distance from radioactive material is a simple and effective means for reducing your dose. Remember the inverse square law, by doubling your distance from a source you will decrease your dose by a factor of four! So, whenever possible or practical, use tongs, tweezers, pipettes or pliers to increase your distance from radioactive material.

SHIELDING

- Materials “absorb” radiation
- Proper shielding = Less Radiation Exposure
- Plexiglas vs. Lead

Effective use of shielding is also a means for keeping your doses low. Shielding material is used to absorb radiation, so proper shielding will lessen your radiation exposure! Remember, if you are using a mid to high beta emitter, use Plexiglas for shielding and when working with gamma emitters, use lead.

LAB SAFETY CHECKLIST

Lab Surveys and Documentation

- RC-1 Forms current?
- Radioisotope forms maintained (track from cradle to grave)?
- Radioisotope transfer forms maintained?
- Adequate survey frequency and documentation?
- Spills involving personnel or > 100 μCi ?
- Follow-up surveys, documentation, and decon of contaminated areas > 100 μCi ?
- Waste disposal receipts?

UNIVERSITY OF FLORIDA RADIOACTIVE MATERIALS USER
STATEMENT OF TRAINING AND EXPERIENCE
(To be completed by ALL personnel who will be working with radioactive materials at the University of Florida)

NAME: _____ DEPARTMENT: _____ PHONE: _____

CLASSIFICATION (Faculty, Technician, Student, etc.): _____

RADIOACTIVE MATERIAL TO BE USED: _____ PRINCIPAL INVESTIGATOR: _____

RADIATION SAFETY TRAINING

SUBJECT	WHERE TRAINED	DATES AND DURATION OF TRAINING	PRECEPTOR ON THE JOB	FORMAL COURSE
A. Principles and practice of radiation protection			☐ Yes ☐ No	☐ Yes ☐ No
B. Radiation Safety Assessment guidelines, including techniques and experience			☐ Yes ☐ No	☐ Yes ☐ No
C. Instruments and techniques used in use and measurement of radioactivity			☐ Yes ☐ No	☐ Yes ☐ No
D. Biological effects of radiation exposure			☐ Yes ☐ No	☐ Yes ☐ No
E. Transportation of radioactive material			☐ Yes ☐ No	☐ Yes ☐ No
F. Spilling and Emergency procedures			☐ Yes ☐ No	☐ Yes ☐ No

RADIOACTIVE MATERIAL HANDLING EXPERIENCE

RADIOISOTOPE USED	APPROXIMATE AMOUNT	WHERE EXPERIENCE WAS GAINED	DATES AND DURATION OF EXPERIENCE	TYPE OF USE

Have radiation exposure records been maintained for you at another institution? Yes ☐ No ☐
 Have read and will abide by the University regulations as set forth in the RADIATION CONTROL GUIDE.

Signature: _____ Date: _____

If additional space is needed, use the back of this sheet. Keep a copy and return original to:
 RADIATION CONTROL DEPARTMENT - 212 Nuclear Sciences Center - Box 116340

During the quarterly lab inspection Radiation Control personnel will be checking RC-1 forms (statement of training forms) for all authorized users in the lab. A copy of your current RC-1 form must be maintained in the lab notebook. RC-1 forms are submitted to Radiation Control once you have successfully complete the Radiation Safety Short Course and they are undated every 2 years.

LAB SAFETY CHECKLIST

Lab Surveys and Documentation

- RC-1 Forms current?
- Radioisotope forms maintained (track from cradle to grave)?
- Radioisotope transfer forms maintained?
- Adequate survey frequency and documentation?
- Spills involving personnel or $> 100 \mu\text{Ci}$?
- Follow-up surveys, documentation, and decon of contaminated areas $> 100 \mu\text{Ci}$?
- Waste disposal receipts?

AFTER EACH USE!

Any time a PI receives or makes a transfer of radioactive material to another PI the transfer must be approved and signed-off by Radiation Control and a utilization form must accompany the transfer form for proper documentation. Transfer forms must be maintained in the laboratory notebook.

LAB SAFETY CHECKLIST

Lab Surveys and Documentation

- RC-1 Forms current?
- Radioisotope forms maintained (track from cradle to grave)?
- Radioisotope transfer forms maintained?
- Adequate survey frequency and documentation?
- Spills involving personnel or $> 100 \mu\text{Ci}$?
- Follow-up surveys, documentation, and decon of contaminated areas $> 100\mu\text{Ci}$?
- Waste disposal receipts?

University limits for removable contamination:

Beta/Gamma 100 dpm / 100 cm^2
Alpha 50 dpm / 100 cm^2

Adequate survey frequency and documentation is crucial. We must be able to show the State Inspectors that authorized users are UF are following the requirements of the Radiation Safety program set forth in the license requirements. One of those requirements is proper documentation of lab surveys. The University of Florida removable contamination limits are 100 dpm/100 square centimeters for beta/gamma emitters and 50 dpm/100 square centimeters for alpha emitters.

When to document a survey?

A survey **must** be documented within **seven** days of isotope use
(Best to schedule one day a week)

OR

If the lab has isotope storage only (no use) or waste still on hand...a documented survey once a month

RADIATION/CONTAMINATION SURVEY

PRINCIPAL INVESTIGATOR: Dr. Who

SURVEYOR: Jack ROOM NO: 13

RADIONUCLIDES USED: P-32 SURVEY NO: 10

SURVEY TYPE: WEEKLY DATE: 05/10/08

RADIATION READINGS:

Survey Meter Model & Serial #
Ludlum L-3 SN 5288974

Area	Reading (mR/hr)
Work Area	0.004
Waste Facilities	0.003
Storage Areas	0.004

CONTAMINATION SURVEY RESULTS
Counting Instrument Model & Serial #
Beckman LS-8000 SN 8577571152

Detection Efficiency 75% for isotope P-32

DETAILED LABORATORY LAYOUT

#	Swipe Identification	Net cpm	Net dpm*	Post Decon dpm
1	Bench	74	99	
2	Floor	250	333	54
3	Sink	20	26	
4	Door	50	67	
5	Floor	5822	7762	88
6	Phone	40	53	
7	Cabinet	10	13	
8	Fage	44	59	
9	Hot plate	13	17	
10	Liq waste jug	55	73	
11	Desk	10	13	
12	Floor	60	80	

*Areas of greater than 100 dpm/swipe must be resurveyed and documented.

DPM = Gross CPM minus background divided by the efficiency of the counting instrument for the particular radioisotope.

The inspectors will check the utilization forms for any use and then check the survey frequency to ensure a documented survey was completed within 7 days. Many labs actively using radioisotopes schedule one day during the week for survey documentation. This is very helpful for the lab and the inspector. If a lab is not actively using radioactive material, merely storing it in a locked area (i.e., refrigerator or freezer) or has radioactive waste in the lab then lab personnel are required to complete and document monthly lab surveys. This too can be scheduled for the same time each month.

LAB SAFETY CHECKLIST

Lab Surveys and Documentation

- RC-1 Forms current?
- Radioisotope forms maintained (track from cradle to grave)?
- Radioisotope transfer forms maintained?
- Adequate survey frequency and documentation?
- Spills involving personnel or $> 100 \mu\text{Ci}$?
- Follow-up surveys, documentation, and decon of contaminated areas $> 100\mu\text{Ci}$?
- Waste disposal receipts?

MINOR SPILL $< 100 \mu\text{Ci}$ of activity
 $< 5 \text{ mR/hr}$ at one foot

While completing the quarterly inspection the lab may be questioned about any spills that may have occurred. A minor spill is considered to be any radioactive material less than 100 microcuries of activity or 5 mR/hour at one foot. Documentation noting such spills must be maintained in the lab.

IN THE EVENT OF A MINOR SPILL

- Notify everyone in the area
- Prevent the spread of contamination
- Call for help if needed
- Decontaminate
 - Only trained staff may handle spill
 - Monitor potentially contaminated staff first (before leaving the area)
 - Lab coat and gloves (shoe covers if necessary)
 - Start from the outside and work your way in
 - Use absorbent paper and detergent as needed
- Survey
 - Below 100 dpm / 100 cm²



In the Event of a minor spill, specific items to remember are: notify everyone in the area that there has been a spill; prevent the spread of contamination as best you can. For example, if you have spilled P-32 the spread paper towels over the area. Call for help if needed, remember the posting with emergency contact phone numbers for Radiation control personnel. Then decontamination, only enlist the help of authorized users of radioactive material. Before leaving the area remember to check for potentially contaminated staff before releasing them. When decontaminating wear lab coat, gloves and shoe covers if the spill has occurred on the floor. Always remember to start from the outside and work inward to lessen the spread. Use absorbent paper and detergent (i.e., RadCon spray) as needed. Once you feel the decontamination is complete, you are required to complete a swipe survey of the spill area to ensure removable contamination levels are below 100 dpm/ 100 square centimeters.

MAJOR SPILL

- Personal contamination or injury
- >100 μCi of activity
- >5 mR/hour at one foot

A major spill is considered when there is personal contamination or injury, a spill of radioactive material greater than 100 microcuries of activity, or greater than 5 mR/hour at one foot.

IN THE EVENT OF A MAJOR SPILL

- Remove individuals from danger
- Call 911 if serious injury
- Limit the spread of contamination & shield if possible
- Call Radiation Control
- Close, lock and post the room
- Decontaminate under the direction of Radiation Control

In the event of a major spill it is important to remove any individuals from danger immediately. Call 911 if there is a serious injury. If possible limit the spread of contamination and shield it as best you can. Call Radiation Control as soon as possible. Close, lock and post the room to ensure other do not enter and spread contamination. Then decontamination can begin under the direction of Radiation Control.

PERSONAL DECONTAMINATION

- Remove contaminated clothing
- Always wear gloves

In the event of personal contamination, remember to wear gloves before removing contaminated clothing. Please note, this needs to be done in a discrete manner if possible.

PERSONAL DECONTAMINATION

- Flush with water
- Mild cleaning solution applied to intact skin
Betadine, Soap, Rad-Con for hands
- Never use harsh abrasive or steel wool



When decontaminating individuals, flush the affected area with water. Use a mild cleaning solution applied to intact skin. This can be betadine, mild soap or Rad-Con for hands. You should never use harsh abrasives or steel wool on skin.

LAB SAFETY CHECKLIST

Lab Surveys and Documentation

- RC-1 Forms current?
- Radioisotope forms maintained (track from cradle to grave)?
- Radioisotope transfer forms maintained?
- Adequate survey frequency and documentation?
- Spills involving personnel or $> 100 \mu\text{Ci}$?
- Follow-up surveys, documentation, and decon of contaminated areas $> 100\mu\text{Ci}$?
- Waste disposal receipts?



Radiation Control personnel will check the lab notebook to verify that follow-up surveys were completed following a spill or contamination event. Documentation must be maintained and results must indicate that decontamination was completed until the contaminated areas were verified to be less than 100 microcuries.

LAB SAFETY CHECKLIST

Lab Surveys and Documentation

- RC-1 Forms current?
- Radioisotope forms maintained (track from cradle to grave)?
- Radioisotope transfer forms maintained?
- Adequate survey frequency and documentation?
- Spills involving personnel or > 100 μCi ?
- Follow-up surveys, documentation, and decon of contaminated areas > 100 μCi ?
- Waste disposal receipts?

The yellow copy of waste disposal receipts must also be maintained in the lab notebook to verify the proper disposal of waste.

LAB SAFETY CHECKLIST

General Lab Safety

- Fume hood calibrated every 12 months?
- Absorbent paper used in designated work areas (plastic side down)?
- Food or drinks in work area?
- Proper shielding for isotopes?
- Adequate security?
- Survey of hands and feet after every use?

While conducting the quarterly inspection Radiation Control will complete a general lab safety check. The inspectors will verify that any fume hoods in the lab have been calibrated within 12 months. If they have not, Radiation Control will contact Lab Safety to have an inspection setup.

Inspectors will also verify absorbent paper is being properly used in designated work areas.

They will ensure that no food are drinks are in the work area.

Inspectors will check for proper shielding material in the work areas. They will also ensure adequate security measures are being used. Remember, rooms must be locked when no one is in the lab for any length of time. Storage locations must be locked when radioactive material is not in use.

Inspectors will also inquire as to whether or not authorized users are surveying the feet and hands following use of radioactive material.

TOP PRIORITY.....

SECURITY!

- Must be locked at all times when no one is present
- Includes radioactive waste
- **Challenge** everyone that you do not know!

I cannot stress how important security of radioactive material is here at UF. Challenge everyone that you do not know in the lab. It is your responsibility to ensure radioactive material in your lab remains secure. Lock refrigerators, freezers, waste containers and any other item in which radioactive material is stored.

LAB SAFETY CHECKLIST

Personnel Monitoring

- Whole body badge?
- Extremity badge (P-32 in quantities > 1mCi)?
- Exposure reports readily available?
- Thyroid counts required (I-125 > 1mCi in any 1 month)
- Urine bioassay required for quantities of H-3 > 25 mCi in any 1 month



The final items that the Radiation Control inspectors check are the personnel monitoring records. Are whole body badges being worn? If the lab uses more than 1 mCi of P-32, are extremity badges being worn. Are exposure reports readily available or do the authorized users know where they are located if they are not in the lab notebook? They check to see if the lab is using more than 1 mCi of I-125 in any 1 month, if so they must have a thyroid scan done. Also, if the lab is using more than 25 mCi of tritium in any 1 month, then urine bioassays are required.

ACTION STEPS

- **Deficiencies**
 - Corrected ASAP
- **Memos**
 - Sent to PI, Department Chair, and RCO
 - 10 days to resolve problems and reply
- **Three memos in 12 months**
 - Radiation Control Committee takes direct action with PI and Department Chair

If any deficiencies are noted during the lab inspection they need to be corrected as soon as possible. If a lab consistently has the same deficiencies then official memos are sent to PIs, Department Chairs, and the Radiation Control Officer. The PI has 10 days to resolve the problems and reply back to Radiation Control. If three memos are sent within a 12 month period then the deficiencies are presented to the Radiation Control Committee. The RCC will then take direct action with the PI and Department Chair.