



VAMC Radiation Safety Refresher Training

March 2011



Taking The Course and Receiving Credit

Who Should Complete This Course?

You should complete this course if you are a VAMC radiation worker listed on an approved non-human use radioactive materials authorization and need to complete refresher training for continued use privileges. You must take refresher training annually.

Receive Course Credit

- Review the course slides.
- Complete the online exam and mail to EHS - Training, 100 EHS.
- Make a copy for your records.
- If you score less than 80% you will be notified to retake the exam.

VAMC Radiation Safety Office Role

- Performs routine audits of labs to ensure compliance with VAMC policy, NHPP and Nuclear Regulator Commission (NRC) regulations.
- Receives and ships all RAM for VAMC.
- Posts and deposits all labs on campus.
- Performs pre-maintenance and pre-equipment disposal surveys. Contact the VAMC Radiation Safety Office (VAMC – RSO) at ext. 5753 to schedule a survey prior to maintenance or equipment disposal.



You Have the Right to Report Radiation Safety Concerns and Violations

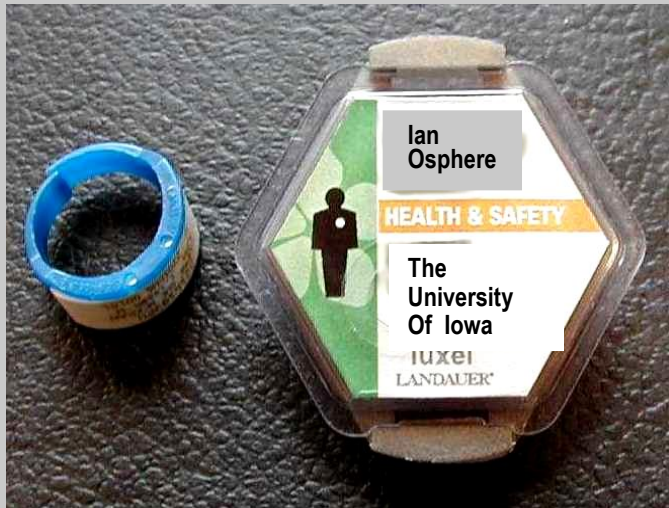
Report concerns or suspected radiation safety violations to your supervisor. If it is not adequately corrected, notify the RSO at 335-8503 or gordon-axt@uiowa.edu

If the violation is still not resolved, you have the right to contact NHPP at 501-257-1571.

NHPP/NRC regulations prohibit academic or job discrimination against individuals who report radiation safety concerns or violations.

Dosimeters

Dosimeters are not typically required for individuals working with tracer quantities of radioactive materials commonly used in a laboratory setting.



Dosimeters are required if you:

Are likely to receive $>10\%$ of an occupational dose limit.

Enter a high radiation area.

Routinely work with >1 mCi quantities of P-32, Fe-59 or Cr-51.

Routinely work with >5 mCi quantities of I-125.

Dosimeters cannot detect low-energy beta radiation from radionuclides such as C-14, H-3, P-33 and S-35.

Dosimeter Requests and Wear Locations



To obtain a dosimeter or change in service, submit a completed "Dosimeter Request or Change" Form found online or go to the VAMC's Radiation Safety Office in the department of Nuclear Medicine.

A whole body dosimeter is worn on the torso in a location where it is likely to receive the highest exposure.

Ring dosimeters are worn underneath disposable gloves.

Dosimeter Participants



- Dosimeters are exchanged monthly. Your new dosimeter(s) will be mailed to you or your group's dosimeter coordinator at the beginning of each month.
- **Mail your old dosimeter(s) from the previous month back to the Environmental Health and Safety Office (EHS) by the 10th day of the month following the wear date, in the return envelope provided.**
- If your dosimeter(s) is lost or returned late three times within one year, an administrative fee of \$20.00 will be charged to your department.
- Your dosimeter report records are available for your review by contacting your supervisor or calling the VAMC – RSO at ext. 5753.

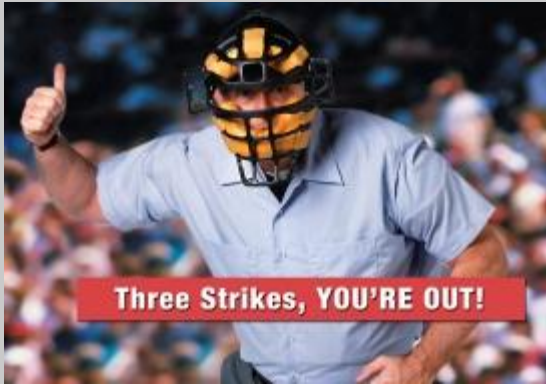
Fetal Dosimeters

A fetal dosimeter and fact sheet are provided to pregnant radiation workers upon completion of the [VAMC Pregnancy Declaration Form](#).

Contact Laurie Scholl at ext. 5753 or 353-5389 for more information.

- A fetal dosimeter is worn at waist level.
- Regulations state that fetal dose is limited to 500 mrem for the entire gestation period for all women who declare their pregnancy in writing.





Three Strikes Policy

Three identical RAM violations found in your lab within 12 months results in termination of your PI's RAM authorization which means that everyone included on that authorization loses permission to work with RAM. Your PI must request reinstatement from the VAMC's Radiation Protection Executive Committee.

Examples of Non-Compliance

- Eating/drinking/smoking/storing food in RAM areas.
- Inventory and survey records that do not reflect actual radioactive materials on hand and/or in use.
- Failure to secure RAM and/or rad waste from unauthorized use or removal.
- Improper radioactive waste storage.

Ordering Radioactive Materials (RAM)

- Your PI must have prior VAMC Radiation Safety Office authorization for the exact chemical form and activity of the RAM you wish to obtain before you order it.
- If you have authorization, contact your vendor and place your order.
- Instruct the vendor to place your PI's name on the packing slip.



Delivery of RAM Shipments



The vendor must ship the package to:

VAMC

601 HWY 6

Nuclear Medicine Department

Room 2W21

Iowa City, IA 52246-2503

Lab Receipt/Inventory Records of RAM



- Verify you received the correct RAM, chemical form, and activity.
- Wear PPE to open RAM shipment.
- Immediately include received material into your lab's RAM inventory and record activity in units of millicuries.
- Assume that the inner surfaces of the package (source vial and packaging material) may be contaminated and handle accordingly until proven otherwise by survey.
- Before discarding the packing material from the shipment. Obliterate all radiation warning labels before discarding as normal trash.

Radioactive Waste Management

- Radioactive waste is collected, processed, and disposed of by EHS.
- Segregate radioactive waste by half-life (less than or greater than 90 days) and type (solid or liquid.)
- Never place lead in any waste container supplied by EHS.
- Container lids must be kept closed except when adding waste.



Radioactive Waste Management

- Store all liquid waste containers within a secondary container - this is mandatory.
- Use labels provided to indicate what is placed in waste containers as soon as you add waste. This prevents unlabeled and unknown waste from accumulating in your lab.
- Avoid overfilling solid or liquid waste containers.
- Never mix organic solvent wastes with water or other aqueous wastes.
- Radioactive waste containing biological, pathogenic, or infectious material must be disinfected with biocide prior to depositing into radioactive waste containers.


Completing the Radioactive Waste Tag

Front

Complete in Pencil

Complete in Pencil

CAUTION: RADIOACTIVE MATERIAL.



PROPERTY OF THE UNIVERSITY OF IOWA

User Application #	Isotope	Activity μCi
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

SPECIAL PRECAUTIONS _____

External Removable Radioactive Contamination $\leq 22 \text{ dpm/cm}^2$ YES NO

Date: _____ Dept: _____

Bldg: _____ Room#: _____

Name: _____

For Liquid and Scintillation Fluid
Also Complete Reverse Side

Back

CHEMICAL COMPOSITION *List the chemical constituents and percent composition contained in the liquid or scintillation fluid.*

Complete Label in Pencil

Contents	%		

pH IF Aqueous _____

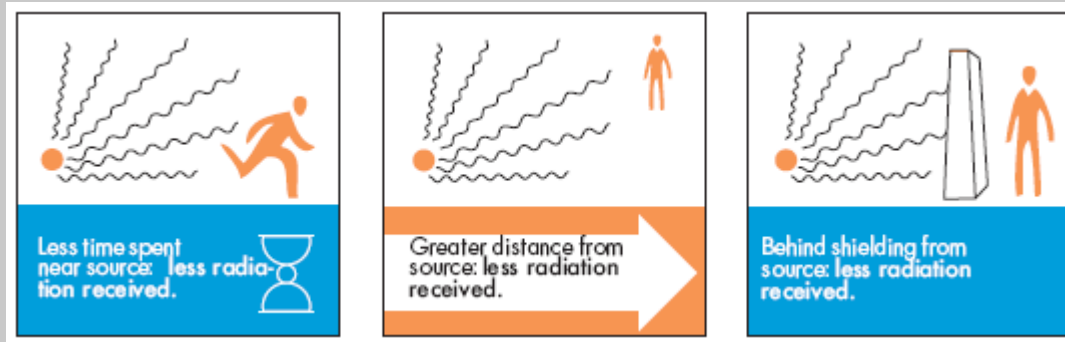
- Complete the tag in pencil.
- Complete all information required.
- Perform a contamination survey of the waste container and record results on the waste tag.
- If waste is liquid, indicate chemical composition on back of the tag.
- Affix tag securely to waste container.

Examples of Good Practice - PPE



- Personal protective equipment is known as PPE.
- Wear the correct PPE for work with RAM and other hazardous materials.
- PPE includes gloves and lab coat (at a minimum).
- Do not wear open-toed shoes when working with any type of hazardous material or equipment.
- Never wear PPE outside the lab!

Time, Distance, and Shielding



The less **TIME** spent near RAM, the less dose received.

The more **DISTANCE** between you and RAM, the less exposure received. Doubling the distance from RAM reduces exposure by $\sim 1/4$. Use tongs or other remote-handling tools to reduce exposure to fingers and hands.

For **SHIELDING** β emitters use Plexiglass. Lead is best for X- or gamma radiation, but each X- or gamma ray emitter has a specific thickness of shielding required to reduce exposure - one size doesn't shield all. Contact the VAMC Radiation Safety Office to determine the proper thickness and types of shielding material to use.

Contamination Surveys - Meters



Prime areas to survey include waste storage areas, source vial storage areas, frequently used areas and equipment, and the floor near work and storage areas.

Suggested Allowable Exposure Rates at 30 cm	
Occupied Areas	<2 mrad/hour
Storage Areas	<5 mrad/hour

Contamination Surveys - Wipes



They are used to determine if removable contamination is present from any type of radioactive material when counted in a liquid scintillation counter.

They are the best method for detecting contamination from low-energy beta emitters (C-14, S-35, and P-33) and the only way to detect H-3 contamination.

Decontamination Action Levels	
Radioiodines	≥ 200 dpm/100 cm ²
All Other Radionuclides	$\geq 2,000$ dpm/100 cm ²

Remember to Document Your Surveys!



- Surveys must be done at a frequency to ensure that exposure to RAM is kept ALARA (as low as reasonably achievable).
- Keep your survey records in a form that the VAMC - RSO and VA's National Health Physics Program (NHPP) can audit.
- Call ext. 5753 for blank survey record forms.

If a survey isn't recorded, you cannot prove it was done.

User Responsibilities

- Keep RAM use authorization current.
- Complete radiation safety training.
- Maintain up-to-date inventory records.
- Perform and document RAM surveys frequently to control contamination and keep exposure ALARA.
- Follow required radiation safety and radioactive waste handling and disposal policies.



Contamination Control and Security

- Wear PPE when working with RAM.
- Monitor hands, shoes, and PPE frequently.
- Use bench paper and spill trays.
- Use warning labels on RAM items and areas.
- Use a fume hood when working with volatile materials or materials that produce aerosols.
- Secure RAM from unauthorized removal.
- Immediately report missing RAM to the VAMC Radiation Safety Office at ext. 5753 or 335-8501.



Spills



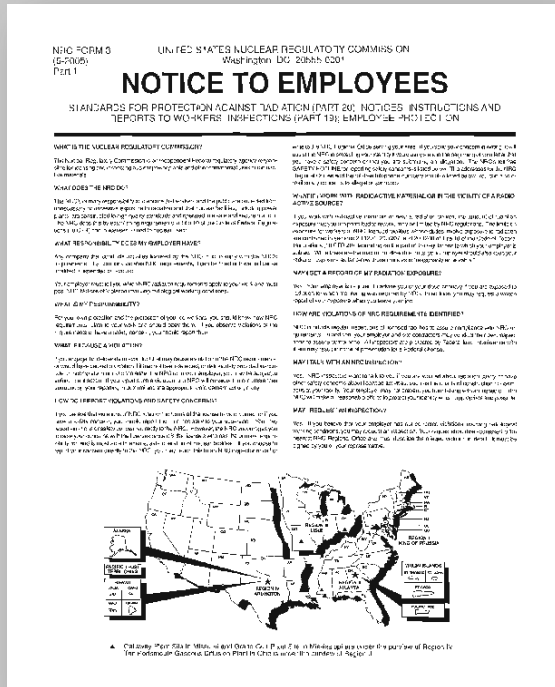
- Uninjured, contaminated individuals remain in the area until decontaminated (if safe). Move all others to another area.
- Handle spills according to your lab's spill response plan.
- Evacuate area of volatile spills.
- Contact ext 5753 or 335-8501 immediately when spills occur! Contact the VAMC Police at ext. 6600 during other than normal business hours of 8:00 - 5:00.



Personal Contamination

- Notify the VAMC - RSO immediately of any case of personal contamination. Call ext. 5753 or 335-8501.
- Uninjured persons should remove contaminated clothing and wash or use emergency shower or eyewash as needed. Do not delay.
- If an injured person is contaminated, do not delay medical attention.
- The Environmental Health and Safety Office can also provide assistance - call 335-8501.

Notice to Employees



NRC's "Notice to Employees, Standards for Protection Against Radiation; Notices Instructions and Reports to Workers; Inspections; Employee Protection" notice is required to be made available to you. These notices are posted in your use areas.

If you believe a radiation safety violation has occurred, report it to your PI. If you believe adequate correction was not taken, notify the VAMC Radiation Safety Office at ext. 5753 or 335-8517. If the violation has still not been corrected contact NHPP at 501-257-1571.

Congratulations!

You have completed the
VAMC Radiation Safety Refresher Course.

To receive credit for this online training course,
you must complete the exam and receive a score of
80% or greater.

[Click here to take EXAM.](#)