Radiation Safety Committee Policy 98-4 provides guidance for the transport of radioactive material (RAM). The policy in part states, “Transport of radioactive materials outside the confines of a designated radioactive material use area shall be made in containers that reasonably secure the material from accidents such as spills and are labeled as to the radioactive material contents. ‘Reasonably secure’ means using a strong tight container or, if liquid, secondary containment appropriate to prevent leakage of liquid.”

Hand-transport and non-motorized vehicle transport (e.g., cart, dolly) of RAM outside of a building requires packaging that is equivalent to that required by the Department of Transportation (DOT) for the shipment of RAM. Appropriate packaging includes the following.

- The original packaging and labeling the RAM had when it was received from a vendor.
- A strong tight container (e.g., sealed cardboard box or enclosed plastic tub). A secondary container is required if the RAM is in liquid form.

In addition, the outside of the packaging must be labeled with the radionuclide, and activity, along with a contact person, and phone number in case of an accident.

The transporter of the RAM must follow safe pedestrian traffic rules. This includes crossing a street after looking both ways, crossing at marked cross-walks, and, if applicable, crossing only with the traffic light.

Motorized vehicle transport of RAM must be in accordance with DOT regulations. DOT regulations for motorized vehicle transport include the following.

- The vehicle being driven by an individual trained in accordance with DOT requirements.
- In DOT approved and labeled packaging.
- Package secured during transport.
- Shipping papers within reach of the driver.

All incidents that involve RAM in transport outside an area specifically approved for RAM use must immediately be reported to the Radiation Safety Office (RSOF). If there is any possibility of a RAM spill or package damage that could result in a spill, the trans-
porter must secure the potentially contaminated area(s) until RSOf personnel arrive.

**RSOF WEBSITE CHANGE**

Recently, the requests feature on the Radiation Safety website (www.uc.edu/radsafety) began experiencing significant problems with spam. In an effort to reduce the spam, a CAPTCHA was added to each of the requests. A CAPTCHA (completely automated public Turing test to tell computers and humans apart) requires a human being to recognize mildly distorted letters displayed and enter the sequence of letters correctly in a response. When requesting a waste pickup or special survey, the displayed letters must be entered correctly prior to submission. If the letters are not entered correctly, the submission will not be processed and the user will be redirected back to the original request page to try again. This corrective action has greatly reduced the amount of spam. If you have questions or problems with the CAPTCHA, please contact the Radiation Safety Office (RSOf) at 558-4110.

**BIOASSAYS**

Bioassays detect the presence or absence of radioactive material (RAM) in the body. The determination of RAM in the body may be measured by direct measurement (in vivo) or indirect measurement (in vitro). Bioassay methods include using a counting system to detect an uptake of radioiodine (direct measurement) in the thyroid, and the radioanalysis of urine, saliva/sputum samples, nasal smears, and fecal samples (indirect measurement).

Section 8.6 of the Radiation Protection Procedures Manual (Authorized User (AU) Manual) covers Radiation Control and Safety Program (RCSP) bioassay requirements. As a general rule, bioassays are required after any incident where RAM may have entered the body. Bioassays may also be required to determine a baseline prior to initiating certain procedures, or at the discretion of the Radiation Safety Officer (RSO), or direction of the Radiation Safety Committee (RSC).

Thyroid bioassays are performed to determine if an uptake of radioiodine (e.g., I-125, I-131) has occurred. Thyroid bioassays are required in accordance with the schedule listed in 8.6.5 of the AU Manual. The schedule requires a thyroid bioassay if:

- I-125 and/or I-131 dosages are prepared for or administered to patients in excess of 30 mCi. (A thyroid bioassay shall be performed within 3 calendar days of the procedure.)
- A container of I-125 and/or I-131 in excess of 2 mCi is opened. (A thyroid bioassay should be performed between 6-72 hours after the vial is opened/radioiodine is used, and must be performed no earlier than 6 hours after and within 3 working days.)
- Greater than 1 mCi of radioiodine in a volatile or dispersible form is used in the open laboratory or bench (e.g., not in a fume hood).

Thyroid bioassays are performed in the Radiation Safety Laboratory (RSL). The individual being measured sits in a thyroid bioassay chair. A detector is positioned over the individual’s thigh, near the knee, for a ten minute “background” count. After the ten minute “background” count, the detector is positioned next to the individual’s neck over the thyroid for another ten minute count. The resulting counts are used to calculate the individual’s potential (or lack of) uptake. The entire procedure takes less than 30 minutes.

Urinalysis is the standard bioassay method used for uptake of many radionuclides. A urine bioassay may be performed following skin contamination, at the request of an individual, and as directed by the RSO. Urine bioassays are required for personnel using trit-
ium (H-3) in accordance with the schedule listed in 8.6.4 of the AU Manual. The schedule requires a urine bioassay if:

- It is suspected tritium has been ingested, inhaled or absorbed by a radiation worker. (A urine bioassay sample will be collected approximately 24 hours later.)
- The amount of tritium used at any one time is greater than 100 mCi, but less than 10 curies. (Urine bioassay samples will be collected prior to use, at the time of use, and weekly thereafter, until results are at or below normal levels.)
- The amount of tritium used at any one time is 10 curies or greater. (Urine bioassay samples shall be collected daily until the results are at or below normal levels.)

The Radiation Safety Office (RSOf) will perform qualitative assessments of saliva, sputum and nasal samples if an individual has a potential uptake of RAM. Quantitative assessments (e.g., urinalysis or thyroid monitoring) will also be performed to determine the amount of RAM in the individual.

The RSOf is not equipped to perform fecal analysis. If fecal analysis is required to determine an uptake of RAM, the RSOf will assign a contractor to analyze the fecal sample.

If an uptake to an individual occurs, the RSOf will conduct a thorough investigation. A thorough investigation is required to determine the root cause of the uptake and implement corrective action to eliminate future uptakes.

**RSOF SUGGESTION BOX**

An operational improvement was initiated by the Radiation Safety Office (RSOf). The improvement is the installation of suggestion boxes within the RSOf to obtain suggestions/improvements from RSOf customers.

Two suggestion boxes were installed. One suggestion box is located on the wall next to the Package Room pickup window (RSL 105). The other suggestion box is on the wall on the second floor immediately inside the door to RSL 201 (second floor entrance). Each suggestion box is labeled “RSOf Suggestion/Improvement box”.

Suggestion cards are provided with each suggestion box. Provide your name, email address, and a clear description for any suggestions/improvements on a suggestion card. If a person desires to remain anonymous, sign the suggestion card as “RSOf customer”. Insert the completed suggestion card into the suggestion box. Individuals who submit suggestions/improvements may receive a monetary reward for suggestions/improvements implemented by the RSOf.

Submitted suggestion cards will be reviewed weekly. An email will be sent to any individual that chooses not to be anonymous to acknowledge receipt of their suggestion. Suggestions considered for possible implementation will be discussed by a sub-group of the RSOf. If deemed a viable improvement, the suggestion will be incorporated into RSOf operations.

The RSOf encourages all customers who have suggestions for RSOf improvements to visit the RSOf and provide their input.

**WARM WEATHER PPE**

Personal Protective Equipment (PPE) is worn to protect an individual from contamination. No skin should be exposed where the possibility exists for contamination. Shorts and skirts with bare legs, and open-toed shoes (e.g., sandals) do not provide adequate protection should an accident involving radioactive material (RAM) occur. Authorized Users (AU) need to remind their staff and pay close attention to ensure laboratory workers wear proper protection in warm weather.
STORAGE OF RADIOACTIVE MATERIAL & WASTE

Q. How long may radioactive material (RAM) be stored in a lab?

Though RAM may technically be kept as long as the Authorized User (AU) retains their authorization, the Radiation Safety Office (RSOf) encourages and section 11.7 of the Radiation Protection Procedures Manual (AU Manual) states RAM should be disposed as waste when it is no longer useful.

Older RAM that may be present in the laboratory or on an AU’s quarterly inventory report should also be considered for disposal as RAM waste. The following guidelines are used by the RSOf when questioning if “old” RAM should be disposed as RAM waste.

- Inventory indicates RAM has decayed to background (i.e., remaining activity = 0.0000000)
- Short half-life radionuclides (half-life ≤ 120 days) are greater than 1 year old
- Long half-life radionuclides (half-life > 120 days) are greater than 3 years old. (For long half-life radionuclides, the radiochemical purity is frequently the primary concern. See RSOf Newsletter article, “Radiochemical Storage”, April 2010.)

Q. How long may radioactive waste be stored in a lab?

The Radiation Safety Office (RSOf) strongly encourages Authorized Users (AU) to dispose of all radioactive waste in a timely manner. Radioactive waste should not be stored in the lab for more than one year. During audits, the RSOf staff reviews the length of time radioactive waste is stored. If the radioactive waste has been stored greater than one year, the AU is encouraged to transfer the radioactive waste to the RSOf as soon as possible. If the radioactive waste has been stored greater than two years, the RSOf staff member will assist the AU/AU staff to assure the waste is transferred to the RSOf within one week.

RSOF ASSISTANCE

Authorized Users (AU) and/or their staff are encouraged to call the Radiation Safety Office (RSOf) for assistance with any radiation safety concerns. The RSOf will provide advice and/or assistance to AUs or their staff on solutions to problems or difficulties they are experiencing. The assistance includes procedures to reduce radiation exposure and/or contamination, and practical solutions to problems that may place the authorization in a noncompliant situation.

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