University of Maryland Baltimore

Radiation Safety Procedure

Procedure Number: 2.1

Title: Ordering, Receiving, Opening, And Transferring Packages Containing Radioactive Materials

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Technical Review and Approval:

_____ **Date:**_____
Radiation Safety Officer

Radiation Safety Committee Approval:

_____ **Date:**_____
Chair, Radiation Safety Committee

PROCEDURE 2.1, ORDERING, RECEIVING, OPENING, AND TRANSFERRING PACKAGES CONTAINING RADIOACTIVE MATERIALS

1.0 Purpose:

This procedure provides instructions for ensuring safe ordering, transport, and handling of radioactive material packages arriving at, or being transferred from, UMB.

2.0 Scope:

This procedure applies to the ordering, receipt, and transfer of all radioactive materials on the UMB campus.

3.0 Procedure:

3.1 Ordering Radioactive Material

3.1.1 Orders for radioactive material shall be placed through the Radiation Safety Office. The Radiation Safety Office will approve Requisitions for Purchase or assign an Inventory Control Number through the following process.

3.1.2 Orders shall be entered into the Inventory Control Data Base when placed and shall include:

- The Authorized User;
- Isotope;
- Activity;
- Compound;
- Vendor;
- Payment method (e.g., Purchase Order number or credit card); and
- Catalog number.

This process ensures that the purchase is allowable under UMB's Radioactive Material License and that an Authorized User is supervising the proper use and handling of the material.

3.2 Receiving Radioactive Material

3.2.1 Radioactive material packages received at UMB are occasionally destined for Nuclear Medicine or Radiation Oncology. They contain radionuclides that will be administered to patients for diagnostic and therapeutic procedures. Deliveries may take place on any day at any time of the day. Other materials are destined for assigned laboratories for research uses. All deliveries will be made to the Radiation Safety Office, with the following exceptions:

- Nuclear Medicine will receive packages that are specific to Nuclear Medicine procedures, including Mo-99/Tc-99m generators, exempt quantity sources for calibration, and other special calibration sources.

- All diagnostic radiopharmaceuticals will also be delivered directly to the Nuclear Medicine Department.

3.2.2 All packages that are received with a White I, Yellow II, or Yellow III label shall be monitored for surface contamination and external radiation levels within 3 hours after receipt if received during working hours, or within 3 hours of the start of the next business day if received after working hours, in accordance with the requirements of COMAR D.906.

3.2.3 All packages shall be visually inspected for any sign of external damage (e.g., wet or crushed). If damage is noted, processing of the package shall be halted and the RSO or his/her designee notified immediately.

3.3 Processing Packages

Upon receipt, all radioactive material packages will be entered into the Process Package Data Base or Nuclear Medicine Database. This process allows for verification against the Inventory Control Data Base to make sure the radioactive material order is correct.

3.4 Radiological Surveys

3.4.1 Contamination

The exterior surface of the package shall be surveyed for removable contamination (e.g., wipe test).

- If wipe test results indicate no radioactive contamination is present on the exterior of the package (e.g., less than 200 dpm per 100 cm^2), then the individual ordering the radioactive material will be called to pick up the package.
- If wipe test results indicate that removable contamination levels are > 200 dpm per 100 cm^2 and < 22,000 dpm per 100 cm^2, the package should be decontaminated prior to delivery to the recipient.
- If wipe test results indicate that removable contamination levels exceed 22,000 dpm per 100 cm^2, the RSO or his/her designee shall be notified immediately.

3.4.2 Radiation

The dose rate from the package at 1 meter from each of the package surfaces shall be measured. The Transportation Index (TI) noted on the packages with “Yellow II” or “Yellow III” labels is the dose rate, in mrem/hour, at 1 meter from the package surface. (See COMAR T.3) The surface dose rate for such packages shall not exceed 200 mrem/hour. The dose rate from packages with “White I” labels shall be less than 0.5 mrem/hour on the package surface. (See 49 CFR 172.403) If dose rates exceed any of the dose rates discussed above, stop and notify the RSO or his/her designee immediately.

3.4.3 Notification

Upon notification and after making the confirmation surveys, the RSO or his/her designee shall immediately notify the final delivery carrier and, RHP/MDE by telephone and telegram, mailgram, or facsimile in accordance to COMAR D.906(d) if the following limits are exceeded:

- The highest surface dose rate is greater than 200 mR/hr or the highest dose rate at 1 meter from the surface of the package exceeds 10 mR/hr.

- Removable radioactive surface contamination exceeding the limits of 49 CFR 173.443 (e.g., 220 dpm/cm^2 for beta and gamma emitters and low

toxicity alpha emitters and 22 dpm/ cm^2 for all other alpha emitting radionuclides)

3.5 Picking Up Packages

Individuals who pick up radioactive material packages from the Radiation Safety Office shall have a photo ID, valid Radiation Safety identification card, and appropriate dosimetry. The individual shall be registered in the Inventory Control Data Base and be trained on transporting radioactive material at the University. The Package Pickup Data Base will be updated and the individual provided with a Receipt for Use and Disposal form.

3.6 Procedure for Opening Packages

3.6.1 Use gloves to prevent hand contamination.

3.6.2 Remove the packing slip from the container.

3.6.3 Open the outer package following supplier's instructions, if provided.

3.6.4 Open the inner package and verify that the contents agree with the packing slip.

3.6.5 Check the integrity of the final source container. Look for broken seals or vials, loss of liquid, condensation, or discoloration of the packing material.

3.6.6 If anything out of the ordinary is discovered, stop the opening procedure immediately and notify the RSO or his/her designee immediately.

3.6.7 Wipe the external surface of the final source container and remove the wipe sample to a low background area.

3.6.8 Assay the wipe sample in an appropriate counting system to determine if there is any removable radioactive contamination.

3.6.9 Check the Inventory Control Data Base to ensure that the material received is the material that was ordered.

3.6.10 Prior to disposal, monitor the packing material and the empty packages for contamination with a radiation detection survey meter, such as a Ludlum 3 GM survey meter.

3.6.11 If contamination is present, treat the package and packing material as radioactive waste.

3.6.12 If the package and packing material is not contaminated, remove or obliterate the radiation labels before discarding as clean trash.

3.6.13 Receipt of all radioactive materials is documented by entering the required data in the Process Package Data Base and Package Pickup Data Base.

3.7 Transferring Radioactive Materials

3.7.1 The shipper of radioactive material shall notify the Radiation Safety Officer of the proposed transfer and provide documented evidence (e.g., the most recent license) that the recipient is licensed by the NRC, an Agreement State, and/or relevant regulatory authority to receive the radioactive material.

3.7.2 The radioactive material shall be delivered to the Radiation Safety Office/EHS with a description of the article, such as the nature of radionuclide, the chemical form, the quantity (activity), the name, address, license number, and phone number of the licensee.

3.7.3 Radioactive materials may be transferred between authorized users with prior written approval from the Radiation Safety Officer.

4.0 Records and Reports:

4.1 Records

4.1.1 Radiation safety records required by this procedure include:

- Radioactive material orders;
- Radioactive material receipt records;
- Radioactive material receipt surveys;
- Radioactive material shipment records;
- Radioactive material shipment surveys;
- Radioactive material licenses;
- Radioactive material transfer records;

4.1.2 Radiation safety records shall be created and maintained consistent with the requirements of Procedure 1.2, *Radiation Safety Records*.

4.2 Reports

Radiation safety reports shall be created and filed consistent with the requirements of Procedure 1.3, *Radiation Safety Reports*.

5.0 References

Code of Maryland Regulations (COMAR) 26.12.01.01
Maryland License MD-07-014-01
UMB Radiation Safety Program