

DOSIMETRY PROGRAM

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

Dosimeters are used to detect and measure an individual's dose from external radiation. The dosimetry program allows Environmental Health and Safety (EHS) to track exposures and to take appropriate actions to maintain radiation doses As Low As Reasonably Achievable (ALARA). Dosimeters measure external radiation dose and do not provide protection against radiation exposure.

Do not work with radioactive material or radiation producing devices without wearing the proper and required dosimetry!

Annual Radiation Dose Limits

Regulatory dose limits for an occupational radiation worker are as follows:

- Whole Body = 5,000 mrem/yr
- Lens of Eye = 15,000 mrem/yr
- Skin/Extremity = 50,000 mrem/yr
- Embryo/Fetus = 500 mrem/pregnancy

In accordance with UNL's ALARA program, exposures measured with dosimeters are reviewed by the Radiation Safety Officer (RSO) on a quarterly basis. The RSO will contact all individuals whose quarterly dose exceeds 3% of the annual limit.

Personnel Requiring Dosimetry

Most radiation workers are required to wear dosimeters; exceptions include radiation workers working with the following: XPS (X-ray Photoelectron Spectroscopy), electron microscopes, dental X-rays, and open sources of only H-3, C-14, P-33, Fe-55, Ca-45 and S-35. Radiation workers required to use dosimetry are as follows:

- *Open Source Users:* radiation workers handling P-32, I-125, Se-75, Fe-59, Na-22, Cr-51, Cl-36 and Cu-64 are required to wear ring and whole-body dosimeters.
- *Sealed Source Users:* radiation workers handling sealed sources are typically required to wear whole-body and, possibly, ring dosimeters. Dosimetry requirements for sealed source users will be determined by the RSO on a case by case basis.
- *Neutron Gauge Users:* radiation workers operating neutron gauges are required to wear whole-body dosimeters.

- *Analytical X-ray Users:* radiation workers operating analytical x-ray machines are required to wear ring and whole-body dosimeters.
- *Veterinary X-ray Users:* radiation workers operating veterinary x-ray machines are required to wear whole-body dosimeters.
- *Human Use (Diagnostic) X-ray Users:* radiation workers operating diagnostic x-ray machines are required to wear whole-body dosimeters.
- *DIOCLE'S Laser Facility Users:* radiation workers operating the lasers are required to wear whole-body dosimeters. Ring dosimeters may be required depending on the type of experiment being performed.
- *Neutron Generator Facility Users:* radiation workers operating the neutron generator are required to wear ring and whole-body dosimeters.

Receiving Dosimetry

- *Whole-Body and Ring Dosimeters:* Upon completion of appropriate radiation safety training, EHS will send dosimeters and training certificates to the designated department Badge Coordinator. Contact your department's administrative office or EHS for the name of your department's Badge Coordinator.
- *Fetal Dosimeters:* Women who become pregnant may choose to participate in the fetal dosimetry program. Contact your department's Badge Coordinator or EHS and complete a **Declaration of Pregnancy form**. EHS will send fetal dosimeters to the Badge Coordinator upon receipt of this form. Contact EHS if an extension of dosimetry service is required after the month containing the baby's due date.
- *Returning Radiation Workers:* Personnel with previously terminated dosimetry service should contact EHS to update appropriate training records and reactivate dosimetry.

Wearing Dosimeter(s)

Dosimeters must be worn at all times when working with a radiation source. When not actively working with a radiation source, store dosimeters in a location that is protected from radiation exposure.

- *Whole-Body Dosimeter:* The whole-body dosimeters should be worn in the upper torso area between the waist and neck (such as on the collar or shirt pocket; see Figure 1).
- *Rings:* The ring dosimeter should be worn on the index, middle, or ring finger of the dominant hand (hand most used during work with radioactive materials). The ring should be turned so the label faces the source of radiation, and worn inside the gloves (see Figure 2).
- *Fetal:* The fetal dosimeter should be worn on the abdomen to monitor radiation exposure to the fetus.



Figure 1. The whole-body dosimeter should be worn in the upper torso area between the waist and neck

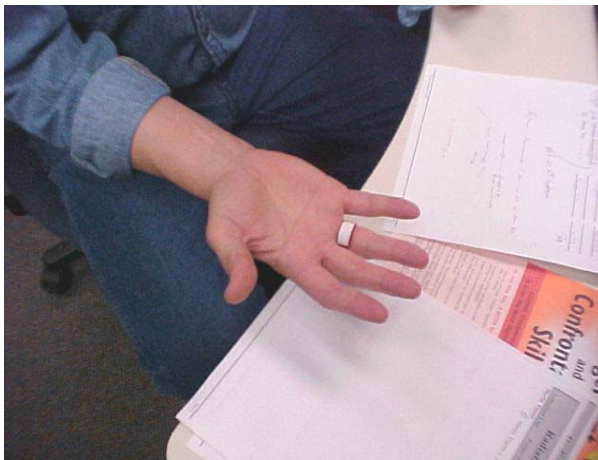


Figure 2. The ring dosimeter should be worn on the index, middle, or ring finger of the dominant hand (hand most used during radioactive work). The ring should be turned so the label faces the source of radiation, and worn inside the gloves.

Dosimetry Exchange

- *Whole Body and Ring Dosimeters:* Every three months (March, June, September, December), dosimeters must be returned to the department Badge Coordinator. At this time, new dosimeter(s) for the next quarter will be distributed.
- *Fetal Dosimeter:* Fetal dosimeters are exchanged monthly through the Badge Coordinator.
- *Research and Extension Center Gauge Users:* Gauge users not located at the Lincoln campuses will not receive dosimetry from October to March unless the Authorized User makes a request to EHS, since gauges are typically not used during this period. If you need to use the gauge during this period, be sure to contact EHS to get dosimetry issued. Never operate a gauge without dosimetry.

Transferring Authorized Users

- *Non-Radioactive Researcher to Radioactive Material Authorized User:* Contact EHS to complete appropriate training requirements for work with radioactive isotopes.
- *Transfer between Radioactive Material Authorized Users:* Contact either departments' Badge Coordinator or EHS with the old and new Authorized User's information. This will allow appropriate dosimeters to be added or deactivated, personnel records to be transferred, and ensure receipt of future dosimeters.
- *Radioactive Material Authorized User to Non-Radioactive Researcher:* Notify the Badge Coordinator or EHS of the transfer and complete a **Personnel Monitoring Service Termination Notice**. Return all used and unused dosimeters to the Badge Coordinator for return to EHS. Note on the Termination Notice if you would like a Termination Report (Exposure History) sent, then indicate the forwarding address.

Terminating Dosimetry Service

- *Fetal Dosimetry:* Immediately contact EHS when fetal dosimetry is no longer required.
- *Leaving UNL or discontinuing work with radioactive material requiring dosimetry:* Contact the department Badge Coordinator and complete a **Personnel Monitoring Service Termination Notice** when dosimeters are no longer needed. Return the Notice and all used and unused dosimeters to the Badge Coordinator. Note on the Termination Notice if you would like a Termination Report (Exposure History) sent, then indicate the forwarding address.

Lost Dosimetry

Contact EHS immediately to obtain a replacement badge/ring for lost dosimeters (ring or whole-body badge). **Do not work with radioactive material or radiation producing devices without required dosimeters.**