Dosimetry: Personnel Monitoring for Radiation Workers

SafetyNet #: 67

State and federal government agencies set limits for permissible radiation exposure to employees during a calendar year. Additionally, at UC Davis, every effort is made to maintain radiation exposure As Low As Reasonably Achievable (ALARA). With the exception of embryo or fetus exposure, the goal is to keep exposures to less than one-half the state and federal limits. Exposure goals for minors (under 18 years old) are 10% of the regulatory limits.

UC Davis Administrative Exposure Limits

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Body</td>
<td>2.5 rem/yr</td>
</tr>
<tr>
<td>Lens of the Eye</td>
<td>7.5 rem/yr</td>
</tr>
<tr>
<td>Skin and Extremities</td>
<td>25 rem/yr</td>
</tr>
<tr>
<td>Embryo/Fetus</td>
<td>0.5 rem/entire period of gestation</td>
</tr>
</tbody>
</table>

Note: The radiation dose to a minor (under 18 years of age) shall be less than 10% of the above guidelines.

To help accurately document radiation exposure, follow these guidelines and be mindful of the ALARA philosophy of radiation protection:

- An EH&S Health Physics staff member or a UC Davis Health (UCDH) Health Physics representative will determine if you should be assigned a dosimeter based on your potential radiation exposure.
- Wear your dosimeter any time you work with or near a radiation source. It is a good idea to wear your dosimeters throughout the work day. Do not take dosimeters home.
- Always wear your whole body dosimeter (either film badge or thermoluminescent dosimeter) on the trunk of the body between collar and waist level. If you work with x-ray machines, dosimetry is worn as follows: 1) Single badged workers - on collar, outside of lead apron; 2) Double badged workers - one on the collar, outside lead apron; and one on the waist, under the lead apron.
- To expedite the reporting process, please make every effort to exchange your dosimeters promptly during the first week of each month or calendar quarter (January, April, July,
October). If your dosimetry is not turned in by the 8th of the month, a late fee will be charged to your UC Davis or UCDH department.

- If your dosimeter is exposed to radiation or extreme heat, is sent to the laundry, becomes contaminated with radioactive material, or your physician gives you a radiopharmaceutical for a nuclear medicine scan, please inform the Office of Environmental Health and Safety or UCDH Health Physics as soon as possible.

- When you terminate your use of radiation sources at UC Davis or UCDH, leave your dosimeter with your department dosimetry coordinator or contact the Office of Environmental Health and Safety or UCDH Health Physics.

- Keep dosimeters dry, contamination free, and away from sources of heat.

- If you work with radiation sources outside of UC Davis, please contact the Office of Environmental Health and Safety/UCDH Health Physics so that your total radiation dose for the year will be tracked.

Any dosimeter that is returned damaged or is lost requires that a dose estimate be made and added to the worker’s exposure record. If your dosimeter is lost, a fee will be recharged to your department to cover the cost of performing the dose estimate and the replacement dosimetry.

Dosimeters are required when it is expected that a worker’s radiation exposure may exceed 10% of the regulatory limits.

<table>
<thead>
<tr>
<th>Radiation Source</th>
<th>Regulatory Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Body</td>
<td>0.5 rem/yr</td>
</tr>
<tr>
<td>Lens of the Eye</td>
<td>1.5 rem/yr</td>
</tr>
<tr>
<td>Skin and Extremities</td>
<td>5 rem/yr</td>
</tr>
</tbody>
</table>

Workers who operate mobile x-ray machines must wear dosimeters. Fluoroscopy operators performing interventional procedures may be assigned 2 badges as determined by the Health Physics staff.

Listed below are various radionuclides and experimental activities that require dosimeters. A dosimeter is not required for beta emitters with $E_{max}$ energies less than 1500 keV.

**RADIONUCLIDE/EXPERIMENTAL ACTIVITY (mCi)**

- P-32, I-131 >5.0
- Cr-51, I-125 >10.0

For additional information, contact EH&S or UCDH Health Physics at 916-734-3355.

**Contact**

**Research Safety**
researchsafety@ucdavis.edu 530-752-1493
FAX: 530-752-4527

**More information**

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