

The following is general information for those involved in the use of radioactive materials. Contact occupational.health@cuanschutz.edu if you have any questions.



- **What is ionizing radiation?**
 - Electromagnetic radiation that has sufficient energy to displace electrons from an atom and break molecular bonds
- **How does radiation affect us?**
 - Interacts with the matter in our bodies and deposits energy
 - The amount of energy deposited is quantified as *dose received*
 - Regulatory limits to how much a member of the public or radiation worker can receive
 - Dose limits are set at low levels, well below the level to potentially cause biological effects such as cancer or cataracts
- **What is the difference between contamination and exposure?**
 - Different types of radiation sources have different risks: mainly exposure vs contamination (see Figure 2)
 - X-ray devices will only produce exposure- no radiation present when the device is turned off
 - Radioactive materials have the potential to result in exposure and/or contamination, which is why safe handling is important
 - Addressed in more detail in radiation worker training
- **How do we protect ourselves?**
 - Radiation protection relies on three principles: time, distance, and shielding (see Figure 1)
 - Less time spent near source = less radiation received
 - Greater distance from source = less radiation received
 - Proper shielding = less radiation received

- The University also has an established radiation safety program that oversees the safe use of radiation and ensures that all exposures are kept as low as reasonably achievable (ALARA)
- **Occupational monitoring**
 - May be used for radiation workers to track their radiation exposure
 - Ensures the doses are kept below the regulatory limits and the University ALARA program limits (see Table 1)
 - Set at a fraction of the regulatory limits

Table 1. ALARA program limits

Tissue of Interest	Annual Dose Limit (mrem)
Whole Body	5000
Organ	50,000
Skin and Extremities	50,000
Lens of the Eye	15,000
Member of the Public	100

- Separate limit for exposure to the fetus for pregnant radiation workers that requires declaration in writing to the Radiation Safety Officer
 - This limit is 500 mrem to the fetus over the course of the pregnancy
- **Emergencies**
 - In the event of an emergency involving accidental exposure or personnel contamination with radioactive material, contact University Police at 303-724-4444
- For more information, reach out to the **University Radiation Safety Office**
 - 303-724-0128

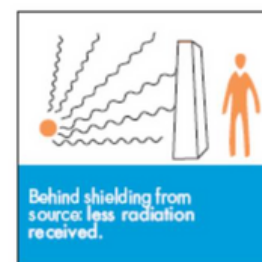
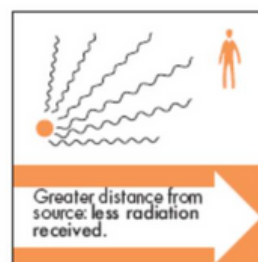
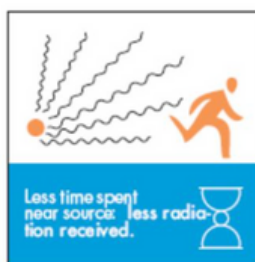


Figure 1. How do we protect ourselves?

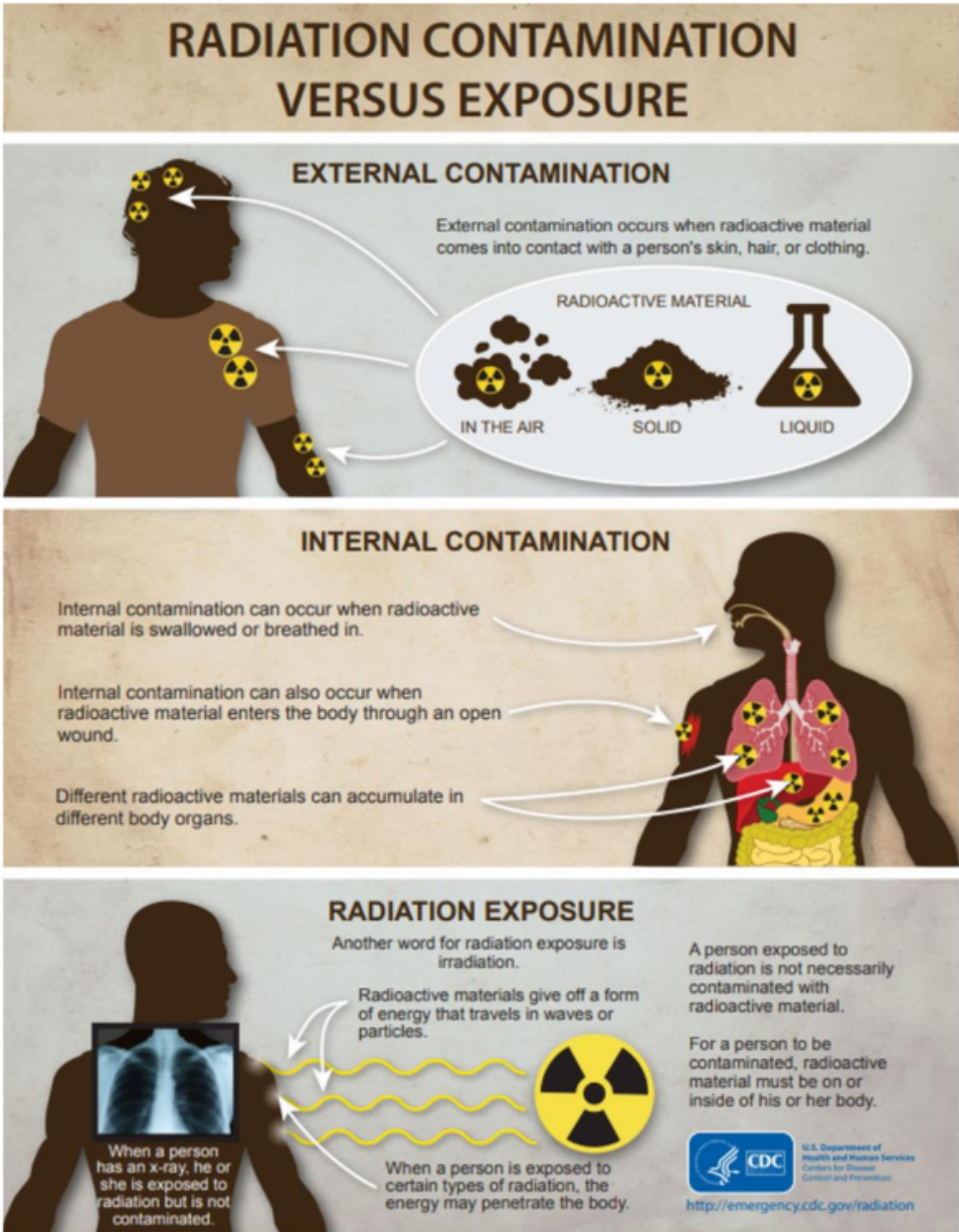


Figure 2. Radiation contamination vs. exposure

For more information, refer to the Occupational Health website
<https://research.cuanschutz.edu/ehs/home/divisions/occupational-health>



or contact Occupational Health at occupational.health@cuanschutz.edu