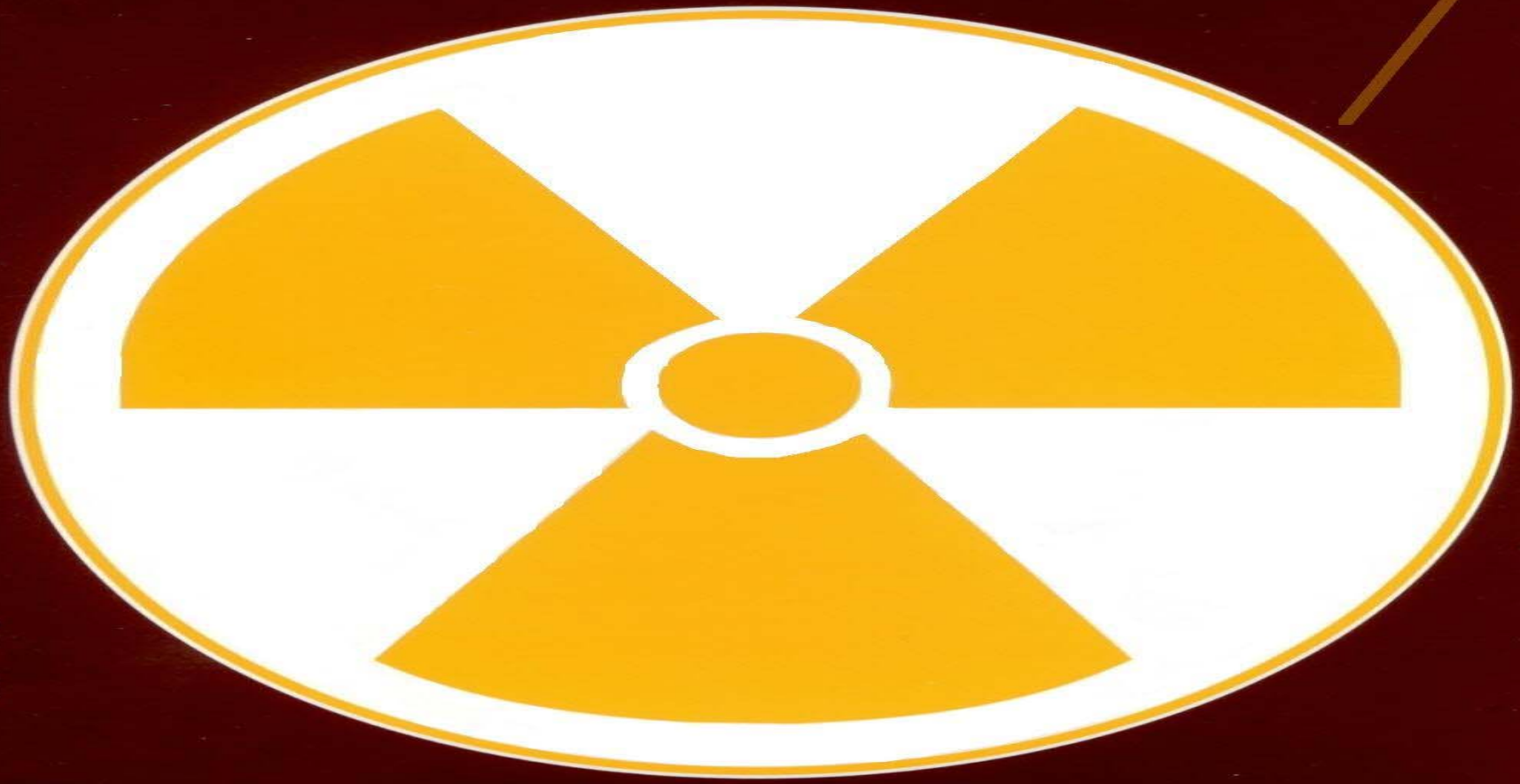
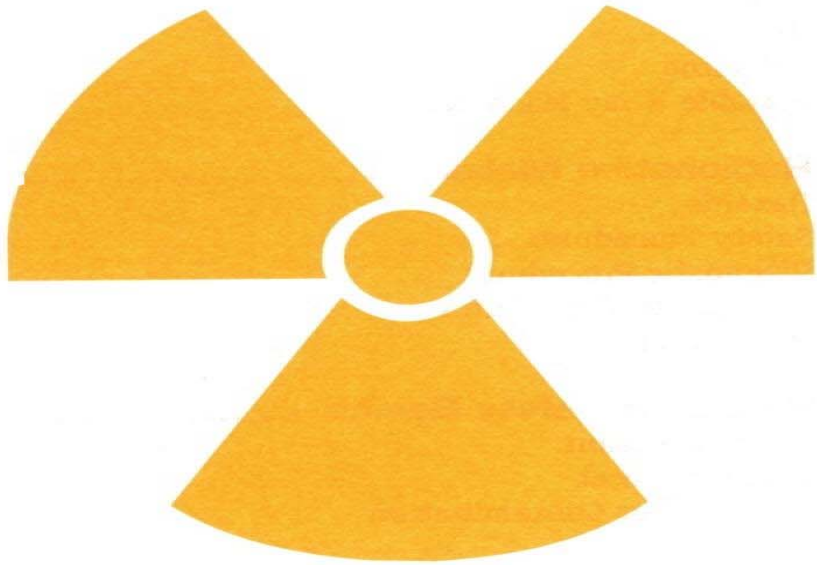
RADIATION SAFETY



INTRODUCTION

As a healthcare worker, you know that radiation is an important tool for detecting and treating diseases. Yet radiation is very powerful and it's natural to have fears about working around it. Fortunately, you can greatly minimize your risk by understanding radiation and carefully following certain safety precautions. This handbook discusses ionizing radiation, a form of energy that you cannot see, feel, smell or taste.



WHAT ARE THE RISKS?

In healthcare facilities, exposure to high levels of radiation on the job is highly unlikely. However, you may repeatedly be exposed to low-level radiation.

- The chance of being affected by radiation increases each time you are exposed.
- Generally, the more radiation you are exposed to, the greater the effect.
- Some types of radiation are more damaging than others.
- Generally, the larger the body area exposed, the greater the risk of overall damage.
- The head, trunk and eye lenses are more easily damaged by radiation than the skin and extremities.
- Exposure during pregnancy can harm your unborn child. If you become pregnant, inform your employer immediately to minimize the risk to your unborn child.

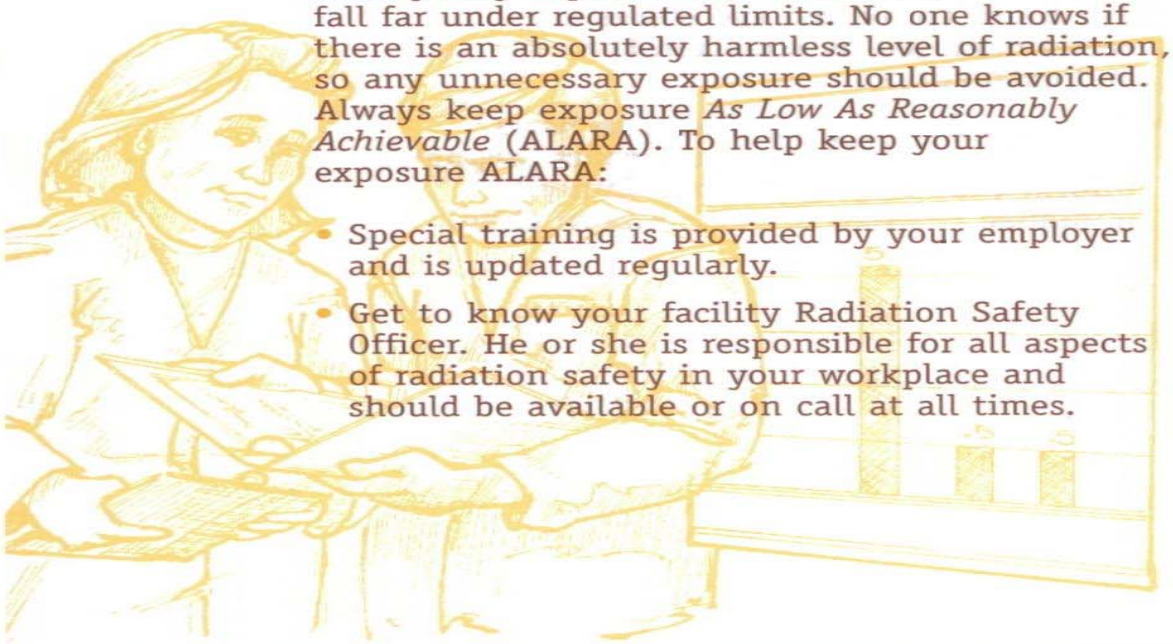
MINIMIZING RISKS

Radiation is one of the most highly regulated occupational fields. You are protected by many safeguards:

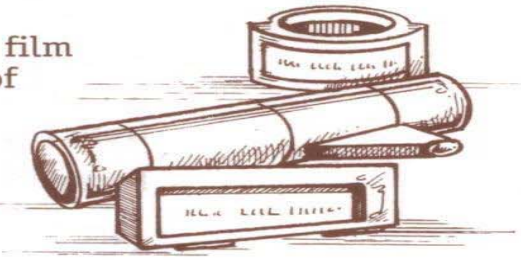
- Federal standards strictly limit on-the-job radiation exposure. Total body exposure for a radiation worker may not exceed five rem or 50 milli sieverts (mSv) per year.
- Exposure during pregnancy should be limited to 0.5 rem or 5mSv or less per year.
- Total body exposure for a non-radiation worker may not exceed 0.1 rem or 1mSv per year.

Total yearly exposures for most radiation workers fall far under regulated limits. No one knows if there is an absolutely harmless level of radiation, so any unnecessary exposure should be avoided. Always keep exposure *As Low As Reasonably Achievable* (ALARA). To help keep your exposure ALARA:

- Special training is provided by your employer and is updated regularly.
- Get to know your facility Radiation Safety Officer. He or she is responsible for all aspects of radiation safety in your workplace and should be available or on call at all times.



- Have a thorough medical examination. It can serve as a baseline for comparison with future exams to determine the effect of radiation on your body and locate potential health problems.
- Thermoluminescent dosimeters (TLD badges), pocket dosimeters and film badges record the amount and type of radiation exposure.



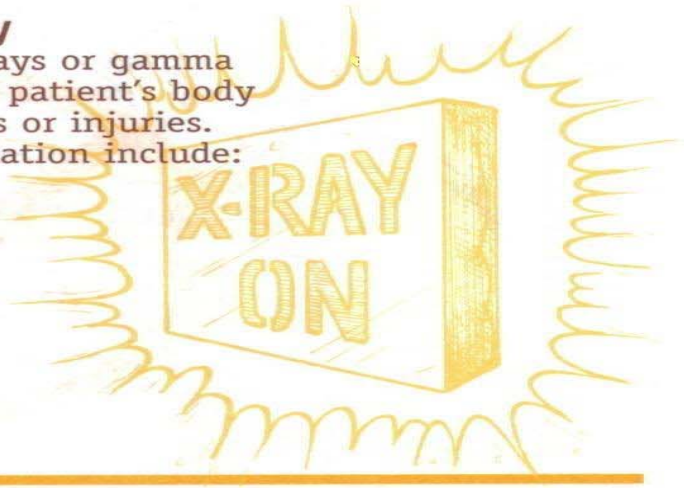
RADIATION IN HEALTHCARE

Two basic forms of radiation are used in healthcare: external beam therapy and radioactive materials.

External Beam Therapy

A beam of radiation, either x-rays or gamma rays, from a source outside the patient's body helps diagnose or treat diseases or injuries. Examples of external beam radiation include:

- X-rays
- CAT scans
- Angiography
- Mammography
- Fluoroscopy.



Hazards

- You will be exposed to radiation it you get in the path of the beam.
- No radiation remains in the x-ray room when the machine is off. Patients do not become radioactive after x-ray treatment.
- Stationary radiation-producing machines are usually well-shielded so no radiation escapes from the x-ray room to surrounding areas.
- Portable x-ray equipment, when operating, may pose a risk to anyone nearby or in adjacent rooms since x-rays can pass through normal walls and other dividers.

PERSONAL EXPOSURE

If you work around external beam therapy. follow this three-part formula to keep your personal exposure ALARA:

Time

Minimize exposure time. During procedures, hold patients only when necessary or get a family member to help.

Distance

Maximize your distance from the radiation source. Stay behind shielding during the procedure with x-ray room doors closed. If you must hold a patient, avoid direct exposure to the x-ray beam.

Shielding

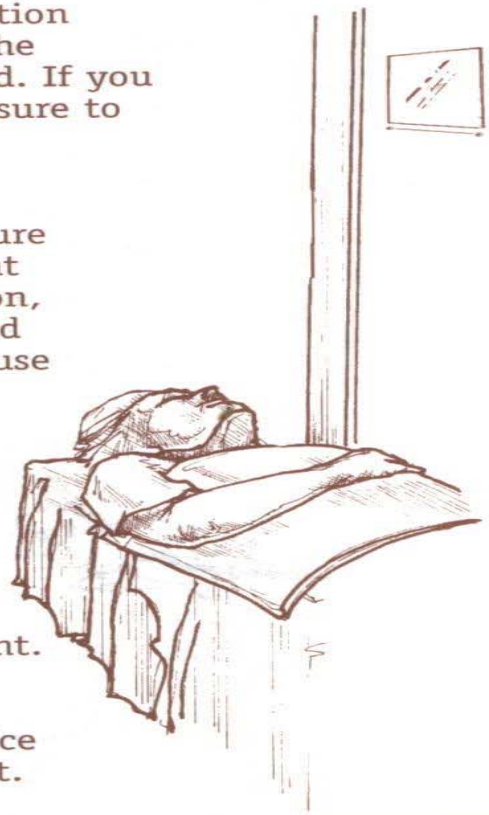
Utilize shielding to avoid direct exposure to radiation. If you must hold a patient during the procedure, wear a lead apron, gloves and goggles. For angioplasty and other consistently elevated exposure, use a thyroid shield and lead glasses.

Portable X-ray machines

- Warn nearby workers before x-rays are taken.
- Allow only the patient and trained personnel in the room.
- Stay at least six feet from the patient.

Monitoring

Always wear a radiation exposure device when working around x-ray equipment.



RADIOACTIVE MATERIALS

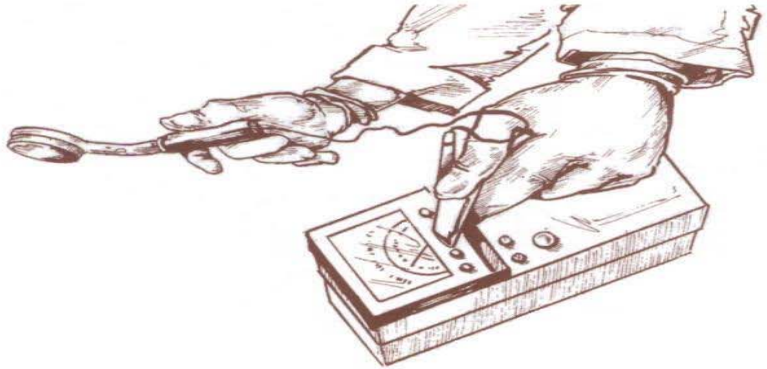
Radioactive materials are widely used in healthcare for diagnosis, treatment and lab procedures.

Diagnosis: Patients swallow materials or are injected with them so their internal organs can be viewed such as in nuclear medicine or in PET scans.

Treatment: Materials are swallowed, injected or placed inside a patient's body to treat cancer and other diseases.

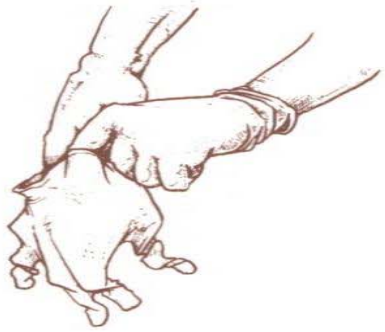
Hazards

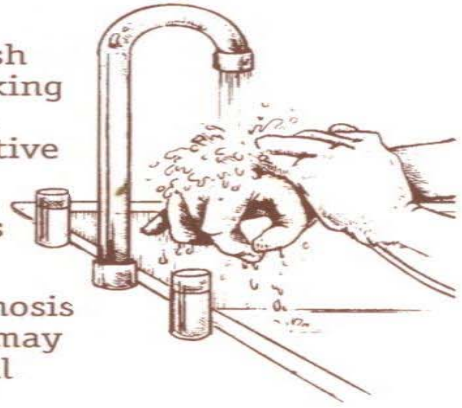
- Radioactive material may contaminate anything it contacts.
- Radioactive material can be inhaled, ingested or absorbed through the skin. Once inside the body, the material may continue to give off radiation, causing great harm.
- Since radioactive material can't be "shut off," it may create a radiation hazard wherever it is used, stored or discarded.



Safety Procedures

- Wear radiation exposure monitoring devices such as film badges or TLD's while working with radioactive materials.
- Wear disposable gloves while handling radioactive material.
- Wear lab coats or other protective clothing if spills are possible.
- Don't touch labeled areas or items without proper authorization and protection.
- When using radioactive material in animal research, handle and dispose of fluids or wastes as radioactive material.
- Accurate records must be maintained for all radioactive material used.
- Always remove protective clothing and wash your hands with soap and water after working in an area containing radioactive material. Do not eat or drink in areas where radioactive materials are being used or stored.
- Monitor hands and feet with survey meters after working with radioactive materials.
- When radioactive material is used for diagnosis or therapy, patients and their body fluids may become radioactive. You must follow special guidelines if you care for or work around such patients.

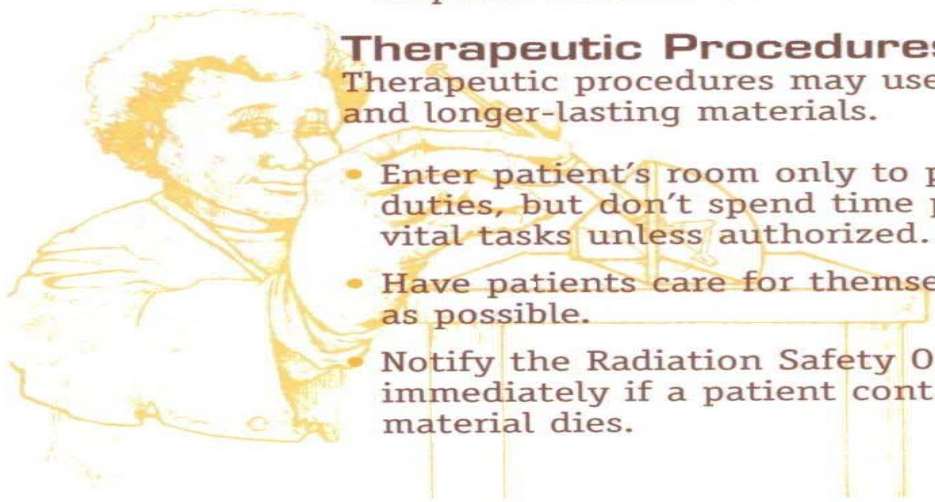




Diagnostic Procedures

In most diagnostic procedures, radioactivity decreases rapidly and risk is low. When handling such patients:

- Wear leakproof gloves when collecting or transferring radioactive urine or fecal material, and when cleaning bedpans or other contaminated items.
- Discard urine and feces through the sanitary sewer.
- Treat syringes and other materials that contact radioactive liquids as radioactive waste.
- Be sure to follow your facility's policy for dispesing of materials also considere biohazardous. Immediately after use, discard sharps in appropriately labeled sharps disposal conatiners.



Therapeutic Procedures

Therapeutic procedures may use more hazardous and longer-lasting materials.

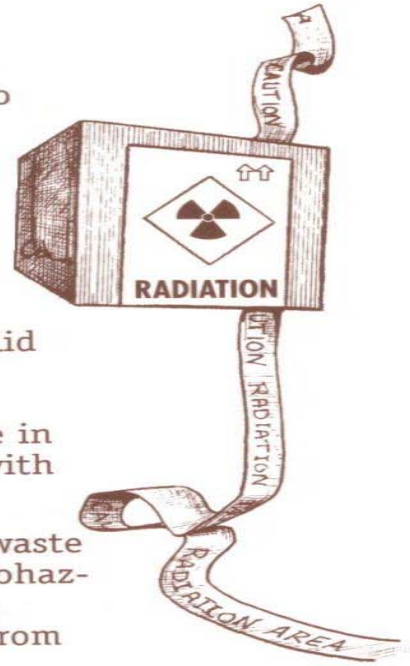
- Enter patient's room only to perform normal duties, but don't spend time performing non-vital tasks unless authorized.
- Have patients care for themselves as much as possible.
- Notify the Radiation Safety Officer immediately if a patient containing radioactive material dies.

RADIATION SAFETY BASICS

Communication

Everything radioactive must be clearly and conspicuously labeled with the radiation hazard sign and other pertinent information. Examples include:

- Tissue or body fluid specimens being sent to the lab
- Radiation areas
- Waste
- Radiation patients.



Waste Disposal

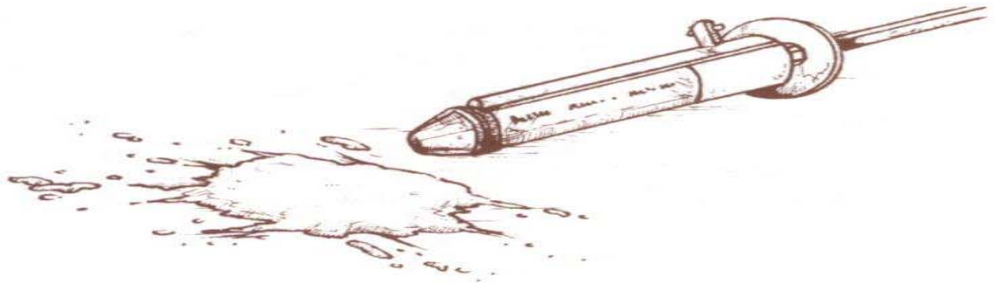
Radioactive or "rad" waste is ant waste that contains or is contaminated with liquid or solid radioactive material.

- Keep wastes separate. Never place rad waste in standard waste containers, and never mix with non-radioactive waste.
- Avoid unnecessarily creating multi-hazard waste which is any combination of radioactive, biohazardous and chemically-hazardous materials. Multi-hazard waste must be kept separate from all other waste.
- Carefully follow your facility disposal procedures. Label containers with CRAM (Caution: Radioactive Material) tags or tape and indicate the name of each nuclide present.
- Never send rad waste directly to the incinerator, pour down a drain, or place in a corridor or other public area.

Accidents or Contamination

Stay calm and follow safety procedures to minimize hazards:

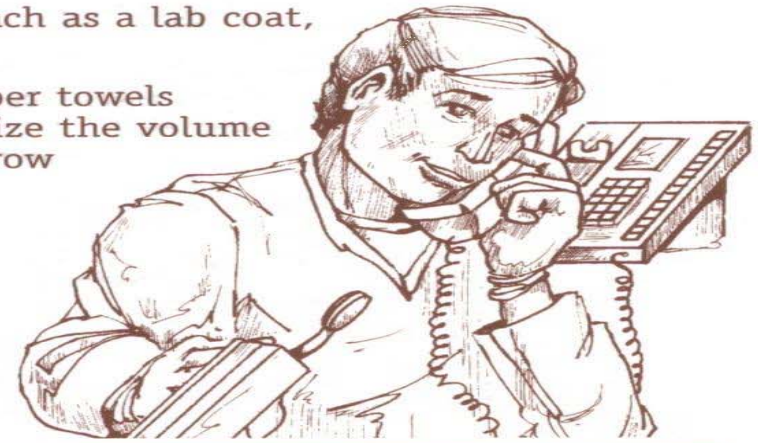
- If you think you might have swallowed or breathed some radioactive material, contact your supervisor.
- If your clothing is contaminated, change into clean clothes and place contaminated clothing in a plastic bag—DO NOT TAKE IT HOME.
- If your skin is contaminated:
  - Wash thoroughly for two or three minutes.
  - Repeatedly soap and rinse hands.
  - Use a non-abrasive, synthetic detergent cleansing agent.
  - Be careful not to abrade or irritate skin. If surveying indicates that contamination still exists, notify your Radiation Safety Officer.
- If you have the proper protection, do not hesitate to help a severely injured person, even if he or she may be contaminated with radioactive material.



Spills

When a spill occurs, immediately notify others in the area and limit access to the spill area. If the spill involves significant levels of contamination and cannot be contained easily, evacuate the area, confine movement of anyone who could have need contaminated to prevent further spread and secure the ares to prevent entry. Then report the spill to the Radiation safety Officer so that proper decontamination of the area and, if necessary, personnel can begin right away:

- First, place absorbent material over the spill to prevent spreading.
- Next, label the spill boundaries with CRAM tape.
- Periodically monitor yourself for contamination. Decontaminate immediately if you find any.
- Wear protective clothing, such as a lab coat, gloves and shoe covers.
- To clean, use moistened paper towels and any commercial. Minimize the volume of water you use. Don't borrow housekeeping equipment.



INFORMATION IS YOUR KEY TO SAFETY

Like many other challenging jobs, working with radiation involves some risk. But it doesn't have to be frightening. Armed with information and a healthy respect for the power of radiation, you can stay safe.

Valley Care Network

RADIATION SAFETY INFORMATION

Radiation Safety Officer for the Valley Care Network is Matilda Jude, MD
The number to call in case of Radiation spill is:
Day x4093
Evenings/weekends – Notify Hospital Operator at x111; State the nature of the emergency and request that the Radiation Safety Officer be notified by pager.

As a healthcare worker, you know that radiation is an important tool for detecting and treating diseases. Yet radiation is very powerful and it's natural to have fears about working around it. Fortunately, you can greatly minimize your risk by understanding radiation and carefully following certain safety precautions,

Radioactive waste should be carefully bagged and labeled, never place radiation waste in corridors or public areas. Keep waste separate, never with regular waste.

Never use your facility housekeeping equipment to clean radioactive spills.

Washing skin with soap and water may help remove radioactive contamination.

In most cases when radioactive material is used for diagnosis, the radiation risk is relatively low.

X-Ray machines create a radiation hazard only when turned on.

Pregnant woman should observe exposure limits, exposure during pregnancy should be limited to 0.5 rem or less.

Wear disposable gloves while handling radioactive material

No radiation remains in the x-ray room when the machine is off. Patients do not become radioactive after x-ray treatment.

Like many other challenging jobs, working with radiation involves some risk. But it doesn't have to be frightening. Armed with information and a healthy respect for the power of radiation, you can stay safe.