



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Radiation Protection

# Radiation Protection Program

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Radiation Control Division

**CAC Meeting**

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# Radiation Control

The goal of the Radiation Control Division is to prevent avoidable radiation injury from the use of radiation sources and to keep public, environmental and worker exposure to as low as reasonably achievable.

# Radiation Control

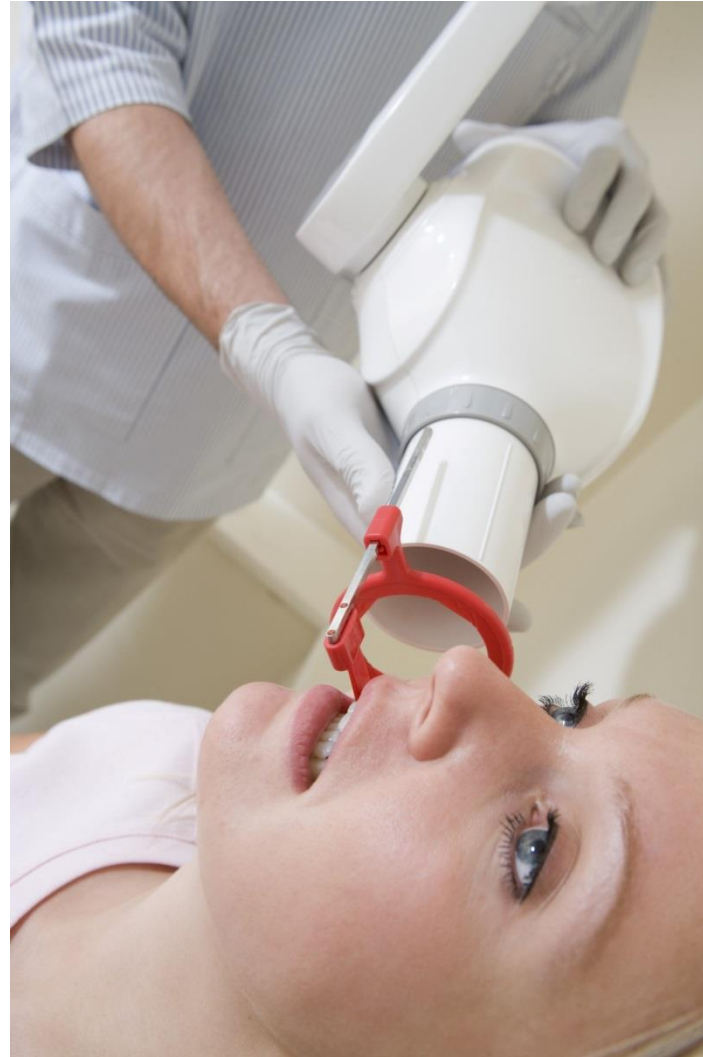
## **Methods of radiation protection include:**

- Regulation;
- Licensing;
- Registration;
- Compliance assistance;
- Public education; and
- Inspection of radiation sources, facilities, and users.

# What are Radiation Sources?

- Dental X-ray machines.
- Mammography X-ray machine.
- Chest X-ray machine.
- Fluoroscopic device.
- Interventional Fluoroscopy.
- Cardiac Catheterization Lab.
- Computed Tomography.
- Accelerators.

# Dental X-ray machine



# Mammography X-ray machine



# Fluoroscopic device



# Interventional Fluoroscopy



Image Courtesy of Siemens Healthcare USA, <https://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/MedicalX-Rays/ucm115354.htm>



# Cardiac Catheterization Lab



# Computed Tomography



# Accelerators



# Radiation Control

- What are Radiation Sources?
  - Radioactive Materials
  - Sealed Sources

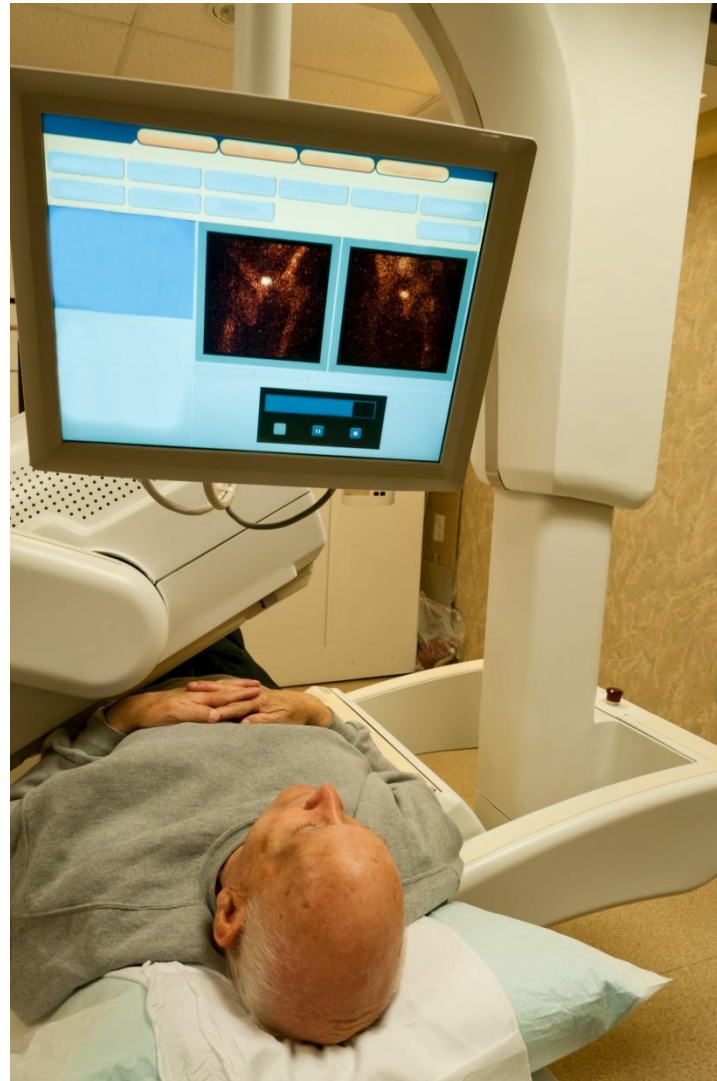
# Portable Nuclear Gauge

- A portable nuclear gauge is also called a nuclear density gauge, a soil moisture gauge, or a moisture density gauge.
- It contains two sealed sources and is used for civil engineering projects and construction that measures soil density or soil water content.
- To measure the soil density, we use gamma radiation, typically a cesium (Cs-137) sealed source of about 8 to 10 millicuries.
- To determine the water content of the sample, the source is typically americium (Am-241) an X-ray emitter, in combination with the element beryllium, causing the emission of neutrons; this arrangement is called an americium-beryllium neutron source.
- It is typically a source of about 40 to 50 millicuries.

# ▶ Radioactive Materials used in Medicine

- Radioactive materials are also use in medicine.
- Radioisotopes are used for diagnostic studies and for therapeutic procedures.

# Nuclear Camera



# PET Scanner





# Radiation Control

To summarize what the Radiation Control Division does:

- Register and inspect X-ray equipment & users;
- License and inspect accelerators & users;
- License and inspect radioactive materials & users;
- and
- Survey facilities for compliance with federal MQSA requirements (contract).

# Radiation Control

- Teletherapy
- Gamma Knife
- Radio-thermal Generator
- Irradiator
- High Dose Brachytherapy
- Industrial Radiography
- Well Logging
- Sealed Sources and Gauges



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# Questions?

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