

X-RAY FACILITY TIPS

Introduction

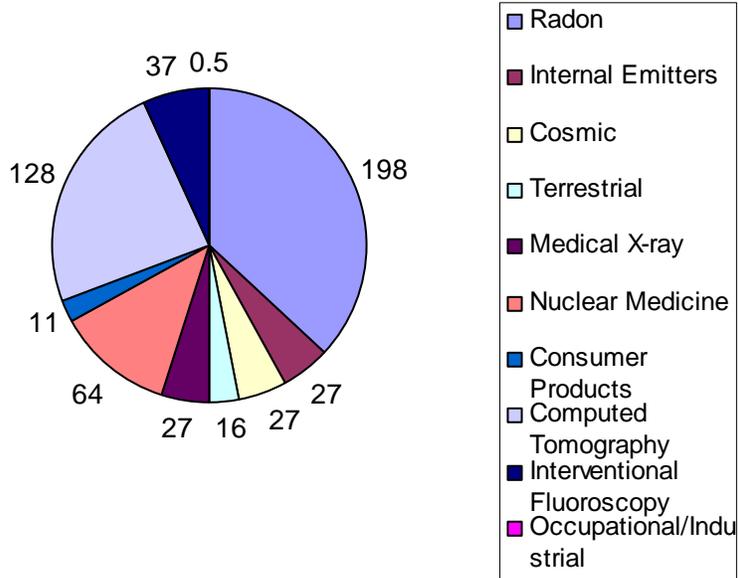
The Vermont Department of Health is providing these “X-Ray Facility Tips” as guidance for health care facilities, though not all suggestions may be appropriate for your facility. In general, most of the information in these documents is guidance for best practice tips. Inspection requirements are, however, indicated by the word “shall”.

At the time of this writing, there are six topics:

- Topic 1: Darkroom Fog
- Topic 2: Facility Shielding
- Topic 3: Lead and Lead-Equivalent Aprons and Thyroid Collars in Dentistry
- Topic 4: Personal Dosimeters (Badges)
- Topic 5: Darkroom Conditions for Radiographic Facilities
- Topic 6: Darkroom Conditions for Dental Facilities

The average annual radiation dose in the United State from all sources is approximately 535 millirem (mrem). About 270 millirem are from natural sources such as radon, cosmic radiation, terrestrial radiation, and internal emitters in the human body and 235 millirem are from medical uses of x-ray and nuclear medicine.

RADIATION EXPOSURE IN THE U.S.
in mrem per year
(total of 535 mrem/year)



Typical Effective Radiation Dose from Diagnostic X-Ray – Single Exposure²

Exam	Effective Dose (mrem)
Bone Densitometry (whole body)	0.04
Hand or Foot	0.5
Skull (Lateral)	1
Dental (Lateral)	2
Chest (AP)	2
Skull (AP)	3
Chest (Lateral)	4
Dental (Panoramic)	9
Thoracic Spine (AP)	40
Pelvis (AP)	70
Lumbar Spine (AP)	70
Mammogram (4 views)	70
Hip	80
Abdomen	120

Typical Effective Radiation Dose from Complete Diagnostic X-Ray Examinations²

Exam	Effective Dose (mrem)
Barium Swallow (106 sec fluoroscopy)	150
CT Head	200
Intravenous Pyelogram (kidneys, 6 films)	250
Barium Enema (137 sec fluoroscopy)	700
CT Chest	800
CT Abdomen	1000
CT Pelvis	1000
Coronary Angiogram	460 – 1580
Angioplasty (heart only)	750 – 5700

Typical Effective Radiation Dose from Nuclear Medicine Examination²

Nuclear Medicine Scan	Radionuclide	Effective Dose (mrem)
Brain (PET)	O-15	100
Lung Perfusion/Ventilation	Tc-99m	200
Hepatobiliary (liver flow)	Tc-99m	280
Kidney (filtration rate)	Tc-99m	360
Bone	Tc-99m	420
Kidney (tubular function)	Tc-99m	520
Heart (rest)	Tc-99m (Myoview)	560
Heart (stress)	Tc-99m (Myoview)	560
Heart (stress)	Tc-99m (Cardiolite)	585
Heart (rest)	Tc-99m (Cardiolite)	670
Brain (perfusion)	Tc-99m	690
Heart	Tl-201	1180
Various PET Studies	F-18	1400
Tumor/Infection	Ga-67	1850

²Adapted from Health Physic Society, "Radiation Exposure from Medical Diagnostic Imaging Procedures – Health Physics Society Fact Sheet".