Dose Rates for Common Radioisotopes

Radioisotope	Half-Life	Millirem/hour @ 1 meter for 1 millicurie	Time Required to Receive a Dose of 100 millirem
Calcium-45	163 d	0	-------
Carbon-14	5,730 y	0	-------
Cesium-137	30 y	8.3	12 h
Chromium-51	28 d	0.02	5000 h
Cobalt-60	5.3 y	1.4	70 h
Hydrogen-3	12.3 y	0	-------
Iodine-125	60 d	0.3	>300 h
Iodine-131	8 d	4.7	21 h
Iron-59	45 d	0.7	140 h
Molybdenum-99	**66 h**	**23.3**	**4 h**
Nickel-63	100 y	0	-------
Phosphorus-32	**14 d**	**33.6**	**3 h**
Sodium-22	2.6 y	4.2	24 h
Sodium-24	**15 h**	**35.0**	**3 h**
Sulfur-35	87 d	0	-------
Technetium-99m	6 h	0.12	>800 h

For other millicurie quantities (**Q**), the time required to receive a dose of **100 millirem** is found by

$$\textbf{Stay Time in Hours} = \frac{\text{Hours for 1 millicurie}}{\textbf{Q} \text{ millicuries}}$$

Doubling Your Distance from a Source Divides the Exposure by 4

Distance x 2 = Exposure ÷ 4

***Counting Efficiencies for a Ludlum 3 Survey Meter with Pancake Probe @ ½ inch from the source :**

Radioisotope	Radiation Emitted MeV	% Counting Efficiency
Calcium-45	β^- 0.258	13
Carbon-14	β^- 0.156	4
Cesium-137	$\beta^- \gamma$ 0.514, 0.662	20, 0.1
Chromium-51	γ 0.320	------
Cobalt-60	$\beta^- \gamma$ 0.318, 1.173, 1.332	14, 0.3
Hydrogen-3	β^- 0.018	0
Iodine-125	X γ 0.027, 0.035	------
Iodine-131	$\beta^- \gamma$ 0.606, 0.364	21, 0.15
Iron-59	$\beta^- \gamma$ 0.466, 1.292	10
Molybdenum-99	$\beta^- \gamma$ 1.214, 0.739	27
Nickel-63	β^- 0.067	0
Phosphorus-32	β^- 1.710	31
Sodium-22	$\beta^+ \gamma$ 0.546, 1.275	18, 0.3
Sodium-24	$\beta^- \gamma$ 1.391, 1.369, 2.754	30, 0.2
Sulfur-35	β^- 0.167	4
Technetium-99m	γ 0.140	0.12

*These tabulated values represent approximate maximum % counting efficiencies for beta and gamma radiations.

Beta particles can travel ~ 12 feet thru air for each MeV of energy.

Gamma rays are attenuated exponentially.
~ 2 inches of lead will stop 90 % of incident gamma rays up to 2 MeV in energy.