Isotopes of Interest: Properties, Treatment, and Fact Sheets

Information in this table adapted from:

- Management of Persons Contaminated with Radionuclides: Handbook (NCRP Report No. 161, Vol. I), National Council on Radiation Protection and Measurements, Bethesda, MD, 2008.

Isotope	Ionizing radiation decay mode	Radioactive half-life	Major exposure pathways	Focal accumulation	Treatment: References for use	Fact sheets (CDC, ATSDR, EPA, Argonne Natl. Lab, Wikipedia)
Americium (Am-241)	α	458 years	Inhalation Skin	Lungs Liver Bone Bone marrow	DTPA† *	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Californium (Cf-252)	α, γ	2.6 years	Inhalation Ingestion	Bone Liver	DTPA*	Argonne (PDF - 2.34 MB) Wikipedia
Cesium (Cs-137)	β, γ	30 years	Inhalation Ingestion	Follows potassium; renal excretion	Prussian blue, insoluble† *	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Cobalt (Co-60)	β, γ	5.26 years	Inhalation	Liver	Succimer (DMSA)§ (DailyMed) DTPA* EDTA§ N-Acetyl-L-cysteine§	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Curium (Cm-244)	α, γ, neutron	18 years	Inhalation Ingestion	Liver Bone	DTPA† *	Argonne (PDF - 2.34 MB) Wikipedia

Iodine (I-131)	β, γ	8.1 days	Inhalation Ingestion Skin	Thyroid	Potassium iodide† * Saturated solution of potassium iodide§ Propylthiouracil§ Methimazole§ Potassium iodate§	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Iridium (Ir-192)	β, γ	74 days	N/A	Spleen	Consider DTPA* Consider EDTA§	CDC Argonne (PDF - 2.34 MB) Wikipedia
Isotope	**Ionizing radiation decay mode**	**Radioactive half-life**	**Major exposure pathways**	**Focal accumulation**	**Treatment:** **References for use**	**Fact sheets (CDC, ATSDR, EPA, Argonne Natl. Lab, Wikipedia)**
Phosphorus (P-32)	β	14.3 days	Inhalation Ingestion Skin	Bone Bone marrow Rapidly replicating cells	Hydration + Phosphate drugs • Sodium glycerophosphate§ • Sodium phosphate§ • Potassium phosphate§ • Calcium carbonate§ • Aluminum hydroxide§ • Aluminum carbonate§ • Sevelamer§ (DailyMed)	Wikipedia
Plutonium (Pu-239)	α	24,100 years	Inhalation (limited absorption)	Lung Bone Bone marrow Liver Gonads	DTPA§ DFOA§ EDTA§ DTPA + DFOA§	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia IEER

Polonium (Po-210)	α	138.4 days	Inhalation Ingestion Skin	Spleen Kidneys Lymph nodes Bone marrow Liver Lung mucosa	Gastric Lavage Dimercaprol (BAL)* Succimer (DMSA)§ (DailyMed) D-Penicillamine§ (DailyMed)	CDC Argonne (PDF - 2.34 MB) HPS (PDF - 492 KB) NRC Wikipedia More references
Radium (Ra-226)	α, β, γ	1,602 years	Ingestion	Bone	Aluminum hydroxide* Barium sulfate* Sodium alginate§ Calcium phosphate§	ATSDR EPA Argonne (PDF - 2.43 MB) Wikipedia
Strontium (Sr-90)	β	28 years	Inhalation Ingestion	Bone	**Inhalation:** Calcium gluconate§ Barium sulfate§ **Ingestion:** Rx is the same as for radium (see above). Additional Rx may include stable strontium compounds: Strontium lactate§ Strontium gluconate§	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Isotope	**Ionizing radiation decay mode**	**Radioactive half-life**	**Major exposure pathways**	**Focal accumulation**	**Treatment: References for use**	**Fact sheets (CDC, ATSDR, EPA, Argonne Natl. Lab, Wikipedia)**
Thorium (Th-232)	α	1.41 x 10^{10}years	Inhalation Ingestion	Bone	Consider DTPA*	ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Tritium (H-3)	β	12.5 years	Inhalation Ingestion Skin	Whole body	Water diuresis*	EPA Public Health England (PHE), formerly Health Protection Agency (HPA),

						(UK) Wikipedia
Uranium (U-235)	α	7.1 x 10^8 years	Inhalation Ingestion	Kidneys Bone	Sodium bicarbonate* For high level intake consider off-label diuretics and/or dialysis§	CDC ATSDR EPA Argonne (PDF - 2.34 MB) Wikipedia
Yttrium (Y-90)¶	β	64 hours	Inhalation Ingestion	Bone	DTPA* EDTA§	Argonne ¶ (PDF - 2.34 MB) Wikipedia

References for use

† **FDA approved:** Countermeasures so marked have been approved as treatment for internal contamination with the listed radioisotope by the US Food and Drug Administration (FDA).

* **NCRP preferred:** Countermeasures so marked have been listed as preferred treatments for internal contamination with the listed radioisotope by the National Council on Radiation Protection and Measurements [Management of Persons Contaminated with Radionuclides: Handbook (NCRP Report No. 161, Vol. I)]. Except where noted, use of these countermeasures has not been approved by the US Food and Drug Administration (FDA).

§ **NCRP suggested:** Countermeasures so marked have been listed as suggested treatments for internal contamination with the listed radioisotope by the National Council on Radiation Protection and Measurements [Management of Persons Contaminated with Radionuclides: Handbook (NCRP Report No. 161, Vol. I)]. Use of these countermeasures has not been approved by the US Food and Drug Administration (FDA).