

Radioactive Isotopes Used in Medical Diagnosis and Therapy

<i>Name and Symbol</i>	<i>Principal Nuclear Properties</i>	<i>Form</i>	<i>Use</i>
Americium ²⁴¹ Am	Half-life 432.7y α (5.49, 5.44) γ (0.060)	Encapsulated source	Diagnostic: External radiation source for bone mineral analyzer
			Therapeutic: Antineoplastic (intracavitary radiation source)
Calcium ⁴⁷ Ca	Half-life 4.53d β^- (0.67, 1.98) γ (1.297)	Calcium chloride	Diagnostic: Calcium metabolism studies
Cesium ¹³⁷ Cs	Half-life 30.0y β^- (1.176, 0.514)	Cesium chloride or cesium sulfate (encased in needles or applicator cells)	Therapeutic: Antineoplastic (teletherapy source, intracavitary or interstitial radiation source)
Daughter ^{137m} Ba	Half-life 2.552min γ (0.662)		
Californium ²⁵² Cf	Half-life 2.645y α (6.217)	Sealed source	Therapeutic: Antineoplastic (intracavitary or interstitial radiation source)
Chromium ⁵¹ Cr	Half-life 27.704d K; γ (0.32)	Chromic chloride	Diagnostic: Determination of serum protein loss into the gastrointestinal tract
		Chromium disodium edetate	Diagnostic: Determination of glomerular filtration rate
		Labeled human serum albumin	Diagnostic: Placenta localization; gastrointestinal protein loss
		Sodium chromate labeled red blood cells	Diagnostic: Determination of red cell volume or mass; red cell survival time; evaluation of blood loss; spleen imaging; placenta localization
Cobalt ⁶⁰ Co	Half-life 5.271y β^- (0.318, 1.48) γ (1.173, 1.332)	Metallic cobalt	Therapeutic: Antineoplastic (teletherapy source, intracavitary or interstitial radiation source)
		Radioactive vitamin B ₁₂	Diagnostic: In Schilling test for absence of intrinsic factor (pernicious anemia) or other defects of intestinal vitamin B ₁₂ absorption
⁵⁷ Co	Half-life 271.77d K; γ (0.122)	Radioactive vitamin B ₁₂	Diagnostic: In Schilling test for absence of intrinsic factor (pernicious anemia) or other defects of intestinal vitamin B ₁₂ absorption
⁵⁸ Co	Half-life 71.91d K; β^+ (0.48) γ (0.811)	Radioactive vitamin B ₁₂	Diagnostic: In Schilling test for absence of intrinsic factor (pernicious anemia) or other defects of intestinal vitamin B ₁₂ absorption
Copper ⁶⁴ Cu	Half-life 12.701h β^- (0.571), β^+ (0.657), γ (1.34)	Copper versenate	Diagnostic: Brain scan
		Copper acetate	Diagnostic: Study of Wilson's disease
Fluorine ¹⁸ F	Half-life 1.8295h β^+ (0.635)	Fludeoxyglucose (FDG)	Diagnostic: Functional brain imaging
		Sodium fluoride (reactor produced)	Diagnostic: Bone scan
Gadolinium ¹⁵³ Gd	Half-life 241.6d K; γ (0.70, 0.097, 0.103)	Sealed source	Diagnostic: External radiation source for bone mineral analyzer
Gallium ⁶⁷ Ga	Half-life 3.261d K; γ (0.093, 0.184, 0.300, 0.393)	Gallium citrate	Diagnostic: Detection of neoplastic and inflammatory lesions; tumor seeking agent
Gold ¹⁹⁸ Au	Half-life 2.6935d β^- (1.371, 0.962) γ (0.412)	Colloidal gold	Diagnostic: Liver imaging
		Colloidal gold or seeds	Therapeutic: Antineoplastic (radiation source) in treatment of widespread abdominal carcinomatosis with ascites; carcinomatosis of pleura with effusion; lymphomas; interstitially in metastatic tumor