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The overall prevalence of adverse reactions from radiopharmaceuticals has been documented at 2.3/100,000 administrations. Many of the adverse reactions listed below were obtained from clinical trials which were not placebo-controlled and may have no causative relation with the radiopharmaceutical. Nevertheless each has been noted and reported to the manufacturer, the SNM, USP, and/ or FDA and therefore is believed at least worthy of mention. Causality is not implied.

- Pharmacopeia Committee of the SNM

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Adverse Reactions to Radiopharmaceuticals

Radiopharmaceutical	Trade Name	Side Effects, Comments & Other Reactions
⁵⁷ Co-cyanocobalamin	Rubratope-57, Dicopac kit	None.
⁵¹ Cr-sodium chromate	Chromitope	erythema, flushing, hypertension, tachycardia and diaphoresis.
¹⁸ F-fludeoxyglucose, FDG, fluorodeoxyglucose		None.
⁵⁹ Fe-ferrous citrate		None.
⁶⁷ Ga-gallium citrate	Neoscan	nausea, vomiting, erythema, flushing, diffuse rash, pruritus, hives/urticaria, respiratory reaction, tachycardia, syncope or faintness, dizziness, vertigo, facial swelling, metallic taste, dyspnea, salty taste.
¹¹¹ In-capromab pendetide	ProstaScint	increase in bilirubin, hypotension, hypertension, injection site reactions, elevated liver enzymes (could be due to tumor), pruritus, fever, rash, headache, myalgia, asthenia, burning sensation in thigh, shortness of breath, alterations of taste, production of HAMA by the recipient.
¹¹¹ In-indium oxyquinoline, Oxine		fever, diffuse rash, pruritus and hives/urticaria.
¹¹¹ In-pentetate DTPA	MPI-DTPA	fever, nausea, vomiting, erythema, flushing, pruritus, hives/urticaria, cardiac arrest.

		hypertension, headache, aseptic meningitis; one death 20 min postinjection.
¹¹¹ In-pentetreotide	Octreoscan	fever, nausea, erythema, flushing, hypotension, bradycardia, dizziness, vertigo, headache, diaphoresis, arthralgia and asthenia, one case of anemia.
¹¹¹ In-satumomab pendetide	OncoScint CR/OV	chills, fever, nausea, erythema, flushing, diffuse rash, pruritus, chest pain, tightness or heaviness, hypertension, hypotension, dizziness, vertigo, headache, diaphoresis, arthralgia and asthenia, confusion, diarrhea, hypothermia, bradycardia, vasodilatation, angioedema, production of HAMA by the recipient.
¹²³ I- <i>l</i> -metyroprone metaiodobenzylguanidine, MIBG		nausea, erythema, flushing, hypertension, respiratory reaction, syncope or faintness, dizziness and vertigo, tachypnea.
¹²³ I-iodohippurate sodium	Nephroflow, Nephropure	nausea, vomiting, diffuse rash, pruritus, hives/urticaria and hypotension.
¹²³ I-sodium iodide		nausea, vomiting, diffuse rash, pruritus, hives/urticaria, chest pain, tightness or heaviness, respiratory reaction, tachycardia, syncope or faintness and headache, tachypnea; parosmia.
¹²⁵ I-iodinated albumin (IHSA, iodinated human serum albumin)		diffuse rash.
¹²⁵ I-sodium iothalamate	Glofil	None.
¹³¹ I- <i>l</i> -metyroprone metaiodobenzylguanidine, MIBG		erythema, flushing, diaphoresis and metallic taste, tingling of arms and face.
¹³¹ I-iodinated albumin	RISA, Radioinated serum, albumin, Megatope	None.
¹³¹ I-iodohippurate sodium	Hipputope, Hippuran	nausea, vomiting, pruritus hives/urticaria, hypertension, respiratory reaction, tachycardia, syncope or faintness, diaphoresis, anaphylaxis, facial swelling, dyspnea; "cold sweat", pallor; amaurosis fugax.
¹³¹ I-sodium iodide	Iodotope	chills, nausea, vomiting, pruritus, hives/urticaria, chest pain, tightness or heaviness, tachycardia, headache, dizziness.
¹³¹ I-6-beta iodomethyl-18- norcholesterol	NP-59	nausea, vomiting, erythema, flushing, chest pain, tightness or heaviness, hypertension, respiratory reaction, tachycardia, dizziness, headaches, diaphoresis, facial swelling, abdominal pain, metallic taste, frozen tongue, dyspnea.
^{81m} Kr-krypton		None.
¹³ N-ammonia		None.
³² P-chromic phosphate suspension	Phosphocol	chills, fever, nausea, vomiting, chest pain, tightness or heaviness, respiratory reaction, abdominal pain, dyspnea, sore throat, cough, pleuritis, myelosuppression.
³² P-sodium phosphate		myelosuppression, bone pain from the flare phenomenon.

⁸² Rb-rubidium		None.
¹⁵³ Sm-lexidronam	Quadramet	myelosuppression, bone pain from the flare phenomenon.
⁸⁹ Sr-strontium chloride	Metastron	chills, fever, myelosuppression, bone pain from the flare phenomenon.
^{99m} Tc-albumin colloid	Microlite	chills, nausea, erythema, flushing, diffuse rash, pruritus, hypertension, hypotension, respiratory reaction, tachycardia, dizziness, vertigo, diaphoresis, anaphylaxis, abdominal pain, myelosuppression (injectate also included MDP and soluble albumin for cases with anaphylaxis).
^{99m} Tc-albumin (HSA, human serum, albumin)		chills, fever, erythema, flushing, diffuse rash, hypotension, tachycardia, dizziness, vertigo, facial swelling, tachypnea, malaise, dyspnea.
^{99m} Tc-arcitumomab	CEA-Scan	transient eosinophilia, nausea, bursitis, urticaria, pruritus, headache, nausea, fever, one grand mal seizure, HAMA production by the recipient.
^{99m} Tc-bicisate dihydrochloride (ethyl cysteinyl dimer, ECD)	Neurolite	nausea, diffuse rash, chest pain, tightness or heaviness, respiratory reaction, seizures, syncope or faintness, dizziness, vertigo, headache, cyanosis and asthenia, neurologic adverse events may have been related to underlying disease, including hallucinations, parosmia, also cardiac failure; respiratory arrest.
^{99m} Tc-disofenin	Hepatology	None.
^{99m} Tc-exametazime (hexamethylpropylene amine oxine, HMPAO)	Ceretec	fever, erythema, flushing, diffuse rash, hypertension, hypotension, respiratory reaction, seizures, diaphoresis, cyanosis, anaphylaxis, facial swelling, abdominal pain, dyspnea with myoclonus (labeled WBC).
^{99m} Tc-glucaptate	Glucoscan, Technescan, Glucaptate	chills, nausea, erythema, flushing, diffuse rash, hives/urticaria, respiratory reaction, tachycardia, seizures, dizziness, vertigo, headache, diaphoresis.
^{99m} Tc-lidofenin	Technescan HIDA	chills, nausea.
^{99m} Tc-macroaggregated albumin (MAA)	AN-MAA, Macrotec, MPI-MAA, Pulmolite, Technescan MAA	chills, nausea, erythema, flushing, diffuse rash, pruritus, hives/urticaria, cardiac arrest, chest pain, tightness or heaviness, hypertension, hypotension, respiratory reaction, tachycardia, syncope or faintness, diaphoresis, cyanosis, anaphylaxis, metallic taste, dyspnea; throat tightness; arm numbness; parosmia.
^{99m} Tc-mebrofenin	Choletec	hives/urticaria.
^{99m} Tc-medronate (MDP, methylene diphosphonate)	Osteolite, Technescan, MDP, AN-MDP, MPI-MDP	chills, fever, nausea, vomiting, erythema, flushing, diffuse rash, pruritus, hives/urticaria, cardiac arrest, chest pain, tightness or heaviness, hypertension, hypotension, respiratory reaction, tachycardia, seizures, syncope or faintness, dizziness, vertigo, headache, diaphoresis, anaphylaxis, abdominal pain, metallic taste, asthenia, pain/burning at inj. site, photophobia, one death secondary to cardiac arrhythmia.
^{99m} Tc-meritide (MAG3)	Technescan MAG3	nausea, vomiting, erythema, flushing, syncope or faintness, sore, thick throat.

mercaptoacetyl-glycylglycylglycine)		
^{99m} Tc-oxidronate (HDP, hydroxymethylene diphosphonate)	Osteoscan-HDP	nausea, vomiting, erythema, flushing, diffuse rash, pruritus, chest pain, tightness or heaviness, heartburn, seizures, diaphoresis, facial swelling.
^{99m} Tc-pentetate (DTPA, diethylenetriaminepentaacetic acid)	Technescan DTPA, AN DTPA, MPI-DTPA, Techniplex	chills, nausea, erythema, flushing, diffuse rash, pruritus, hives/urticaria, hypertension, hypotension, respiratory reaction, tachycardia, syncope or faintness, headache, cyanosis, anaphylaxis, arthralgia, pain, burning at inj. site, cough; wheezing; trisodium salt can cause neurologic signs if given intrathecally.
^{99m} Tc-pyrophosphate (PYP) and Sodium Pyrophosphate)	Pyrolite, Technescan PYP, Phosphotec, MPI, Pyrophosphate, AN Pyrotec, Ultratag	chills, fever, nausea, vomiting, erythema, flushing, diffuse rash, pruritus, hives/urticaria, chest pain, tightness or heaviness, hypotension, respiratory reaction, syncope or faintness, dizziness, vertigo, pain/burning at inj. site, tinnitus.
^{99m} Tc-sestamibi	Cardiolite, Mirluma	nausea, erythema, flushing, diffuse rash, pruritus, seizures, headache, metallic taste, tingling.
^{99m} Tc-sodium pertechnetate	Minitec, UltratecKow	chills, nausea, vomiting, diffuse rash, pruritus, hives/urticaria, chest pain, tightness or heaviness, hypertension, dizziness, vertigo, headache, diaphoresis, anaphylaxis.
^{99m} Tc-succimer (DMSA, dimercaptosuccinic acid)	MPI-DMSA, Nephrosint	nausea erythema, flushing, syncope or faintness, abdominal pain.
^{99m} Tc-sulfur colloid	AN-Sulfur Colloid, TechneColl, TcSC, Tesuloid	chills, fever, nausea, vomiting, erythema, flushing, diffuse rash, pruritus, hives/urticaria, cardiac arrest, chest pain, tightness or heaviness, hypertension, hypotension, respiratory reaction, tachycardia, bradycardia, seizures, syncope or faintness, dizziness, vertigo, headache, diaphoresis, cyanosis, anaphylaxis, arthralgia, pain/burning at inj. site, wheezing, dyspnea, choking; sneezing, itchy throat, parasthesia, weakness.
^{99m} Tc-tetrofosmin	Myoview	angina, hypertension, Torsades de Pointes (these three probably occurred because of underlying heart disease); vomiting, abdominal discomfort, cutaneous allergy, hypotension, dyspnea, metallic taste, burning of mouth, unusual odor, mild leukocytosis.
²⁰¹ Tl-thallous chloride		fever, erythema, flushing, diffuse rash, pruritus, hypotension.
¹²⁷ Xe-xenon		None.
¹³³ Xe-xenon		None.

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