system. Since the gamma-ray energies are not particularly good for scanning and the radiation dose to the patient is relatively high, it has generally been superseded by more suitable agents such as technetium-99m-labelled compounds.

Indium-111

Indio 111.

CAS — 15750-15-9.

ATC — V09AX01 (indium pentetate (^{111}In)); V09GX02 (indium imciromab (^{111}In)); V09HB01 (indium oxinate labelled cells (^{111}In)); V09HB02 (indium tropolonate labelled cells (^{111}In)); V09IB01 (indium pentetreotide (^{111}In)); V09IB02 (indium satumomab pendetide (^{111}In)); V09IB03 (indium antiovariumcarcinoma antibody (^{111}In)); V09IB04 (indium capromab pendetide (^{111}In)).

ATC Vet — QV09AX01 (indium pentetate (^{111}In)); QV09GX02 (indium imciromab (^{111}In)); QV09HB01 (indium oxinate labelled cells (^{111}In)); QV09HB02 (indium tropolonate labelled cells (^{111}In)); QV09IB01 (indium pentetreotide (^{111}In)); QV09IB02 (indium satumomab pendetide (^{111}In)); QV09IB03 (indium antiovariumcarcinoma antibody (^{111}In)); QV09IB04 (indium capromab pendetide (^{111}In)).

HALF-LIFE. 67 hours (2.8 days).

Profile

Indium-111 as indium (^{111}In) complexed with pentetic acid (pentetate) is used diagnostically in CSF studies.

Leucocytes labelled with indium (^{111}In) hydroxyquinoline are used for the location of inflammatory lesions; applications have been the detection or localisation of abscesses, infections (including those occurring in patients with AIDS), inflammatory bowel diseases such as Crohn's disease or ulcerative colitis, and transplant rejection. Platelets have been similarly labelled and used for the detection of thrombi and for the investigation of thrombocytopenia. Labelled erythrocytes have been used to investigate gastrointestinal haemorrhage.

Colloids have been prepared using indium chloride (^{111}In) and have been used for investigation of the lymphatic system. Indium (^{111}In) bleomycin has been given by intravenous injection for the detection of tumours. Indium (^{111}In) pentetreotide is used for the detection and localisation of tumours originating from neuroendocrine cells.

Several different monoclonal antibodies, such as altumomab pentetate, capromab pendetide, ibritumomab tiuxetan, imciromab pentetate, and satumomab pendetide, have been labelled with indium-111. Uses include the detection, diagnosis, and evaluation of malignant neoplasms of the colon, rectum, prostate, and ovaries as well as the detection and localisation of myocardial infarction.

Breast feeding. The American Academy of Pediatrics has stated[1] that temporary cessation of breast feeding is required after exposure to indium-111 since a very small amount of radioactivity has been reported to be present in breast milk for 20 hours.

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108:** 776–89. Correction. *ibid.*; 1029. Also available at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776 (accessed 01/07/04)

Preparations

Ph. Eur.: Indium(In) Chloride Solution; Indium(In) Oxine Solution; Indium(In) Pentetate Injection;
USP 31: Indium In 111 Capromab Pentetide Injection; Indium In 111 Chloride Solution; Indium In 111 Ibritumomab Tiuxetan Injection; Indium In 111 Oxyquinoline Solution; Indium In 111 Pentetate Injection; Indium In 111 Pentetreotide Injection; Indium In 111 Satumomab Pendetide Injection.

Proprietary Preparations (details are given in Part 3)
Austria: Octreoscan; ***Cz.:*** Myoscint†; Octreoscan; OncoScint†; ***Israel:*** Prostascint Kit; ***Ital.:*** Octreoscan; ***Neth.:*** OctreoScan; ***Port.:*** Octreoscan; ***Spain:*** OncoScint CR 103†; ***USA:*** Octreoscan; OncoScint CR/OV†.

Indium-113m

Indio 113m.

CAS — 14885-78-0 (indium-113).

HALF-LIFE. 99.5 minutes.

Profile

Indium-113m is a daughter of tin-113 (^{113}Sn, half-life 115 days) and because of its short half-life is normally prepared just before use by elution from a sterile generator consisting of tin-113 adsorbed on an ion-exchange material contained in a column.

Indium-113m may be used for labelling a variety of materials with differing physical properties including particles and colloids suited to scanning procedures for various organs and tissues. Chelates with pentetic acid have also been used. The short half-life of indium-113m and its lack of beta-emission have allowed large doses to be given with a small radiation dose to the patient. High count rates for scanning are therefore achieved.

Iodine-123

Iodo 123.

CAS — 15715-08-9.

ATC — V09AB01 (iodine iofetamine (^{123}I)); V09AB02 (iodine iolopride (^{123}I)); V09AB03 (iodine ioflupane (^{123}I)); V09CX01 (sodium iodohippurate (^{123}I)); V09FX02 (sodium iodide (^{123}I)); V09IX01 (iobenguane (^{123}I)).

ATC Vet — QV09AB01 (iodine iofetamine (^{123}I)); QV09AB02 (iodine iolopride (^{123}I)); QV09AB03 (iodine ioflupane (^{123}I)); QV09CX01 (sodium iodohippurate (^{123}I)); QV09FX02 (sodium iodide (^{123}I)); QV09IX01 (iobenguane (^{123}I)).

HALF-LIFE. 13.2 hours.

Profile

Iodine-123 has similar adverse effects and precautions to those of iodine-131 (see below).

Its principal use is in thyroid uptake tests and thyroid imaging when it is given orally or by intravenous injection as sodium iodide (^{123}I).

Sodium iodohippurate (^{123}I) is given intravenously in tests of renal function and in renal imaging.

Iobenguane (^{123}I) (*m*-iodobenzylguanidine (^{123}I)) is given intravenously for the localisation of certain tumours, for example phaeochromocytomas, and for the evaluation of neuroblastoma. It is also used for functional studies of the adrenal medulla and myocardium.

Ioflupane (^{123}I) is given intravenously to detect loss of functioning dopaminergic neurones in the differential diagnosis of tremor and parkinsonism.

Various monoclonal antibodies have been labelled with iodine-123; potential applications include the detection of malignant neoplasms.

Breast feeding. The American Academy of Pediatrics has stated[1] that temporary cessation of breast feeding is required after exposure to iodine-123 since radioactivity has been reported to be present in breast milk for up to 36 hours.

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108:** 776–89. Correction. *ibid.*; 1029. Also available at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776 (accessed 01/07/04)

Preparations

Ph. Eur.: Sodium Iodide(I) Injection; Sodium Iodide(I) Solution for Radiolabelling; Sodium Iodohippurate(I) Injection;
USP 31: Iobenguane I 123 Injection; Iodohippurate Sodium I 123 Injection; Sodium Iodide I 123 Capsules; Sodium Iodide I 123 Solution.

Proprietary Preparations (details are given in Part 3)
Cz.: DaTSCAN; Hippuran; ***Fr.:*** DaTSCAN; ***Ital.:*** DaTSCAN; ***Neth.:*** AdreView; DaTSCAN; Hippuran; ***Port.:*** DaTSCAN; ***UK:*** DaTSCAN.

Iodine-125

Iodo 125.

CAS — 14158-31-7.

ATC — V09CX03 (sodium iotalamate (^{125}I)); V09GB01 (fibrinogen (^{125}I)); V09GB02 (iodinated human albumin (^{125}I)); V09IX03 (iodine CC49 monoclonal antibody (^{125}I)).

ATC Vet — QV09CX03 (sodium iotalamate (^{125}I)); QV09GB01 (fibrinogen (^{125}I)); QV09GB02 (iodinated human albumin (^{125}I)); QV09IX03 (iodine CC49 monoclonal antibody (^{125}I)).

HALF-LIFE. 60.1 days.

Profile

Iodine-125 has similar adverse effects and precautions to those of iodine-131 (see below).

Iodine-125 is not very suitable for the external counting of radioactivity in the thyroid gland because its gamma-energy is weak and tissue absorption is high. However, it is very suitable for radio-immunoassays *in vitro* and because it has a long half-life it is preferred as a label for many compounds to detect and estimate drugs and hormones in body fluids.

Iodine-125 has been used orally as sodium iodide (^{125}I) in the diagnosis of thyroid disorders.

Sodium iotalamate (^{125}I) has been used intravenously in the determination of glomerular filtration rate and sodium iodohippurate (^{125}I) intravenously for the measurement of effective renal plasma flow.

Iodine-125, as iodinated (^{125}I) human fibrinogen, has been used intravenously to demonstrate and locate deep-vein thrombosis of the leg. Iodinated (^{125}I) fibrinogen has also been used in the measurement of fibrinogen metabolism in certain disturbances of blood coagulation.

Human albumin iodinated with iodine-125 has been used for the determination of blood or plasma volume.

Iodine-125 implants have been used for the local treatment of cancers (brachytherapy). Titanium capsules containing iodine-125 adsorbed onto a silver rod have been used in the treatment of cancers of the head and neck, lung, pancreas, and prostate. Brain tumours have been treated with titanium capsules containing iodine-125 adsorbed onto anion exchange resin spheres.

Breast feeding. The American Academy of Pediatrics has stated[1] that temporary cessation of breast feeding is required after exposure to iodine-125 since radioactivity has been reported to be present in breast milk for 12 days.

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108:** 776–89. Correction. *ibid.*; 1029. Also available at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776 (accessed 01/07/04)

Preparations

Ph. Eur.: Human Albumin Injection, Iodinated (I);
USP 31: Iodinated I 125 Albumin Injection; Iothalamate Sodium I 125 Injection.

Proprietary Preparations (details are given in Part 3)
Austral.: OncoSeeds; Rapid Strand; ***USA:*** Glofil.

Iodine-131

Iodo 131.

CAS — 10043-66-0.

ATC — V09CX02 (sodium iodohippurate (^{131}I)); V09FX03 (sodium iodide (^{131}I)); V09IX02 (iobenguane (^{131}I)); V09XA01 (iodine norcholesterol (^{131}I)); V09XA02 (iodocholesterol (^{131}I)); V09XA03 (iodinated human albumin (^{131}I)); V10XA01 (sodium iodide (^{131}I)); V10XA02 (iobenguane (^{131}I)); V10XA53 (iodine tositumomab (^{131}I)).

ATC Vet — QV09CX02 (sodium iodohippurate (^{131}I)); QV09FX03 (sodium iodide (^{131}I)); QV09IX02 (iobenguane (^{131}I)); QV09XA01 (iodine norcholesterol (^{131}I)); QV09XA02 (iodocholesterol (^{131}I)); QV09XA03 (iodinated human albumin (^{131}I)); QV10XA01 (sodium iodide (^{131}I)); QV10XA02 (iobenguane (^{131}I)); QV10XA53 (iodine tositumomab (^{131}I)).

HALF-LIFE. 8.04 days.

Adverse Effects

A percentage of patients treated with iodine-131 for hyperthyroidism become hypothyroid each year, depending on the dose given, and eventually most patients will require thyroid replacement therapy. Hypoparathyroidism has also been reported. Radiation thyroiditis with soreness may develop shortly after treatment. There may be severe and potentially dangerous swelling of the thyroid especially in patients with large goitres and this has on rare occasions produced asphyxiation. Leukaemia and carcinoma of the thyroid have occasionally been reported, particularly in young patients. Retrospective studies have shown an increased incidence of thyroid cancer in adults after iodine-131 treatment for hyperthyroidism. However, the absolute risk of thyroid cancer is small and the underlying thyroid disease may play a role.

In the treatment of thyroid carcinoma, the larger doses of radioactive iodine sometimes cause nausea and vomiting a few days after ingestion, which may be due to gastritis as iodine-131 is also concentrated in gastric mucosa. Salivary gland toxicity may also occur. Large doses depress the bone marrow.

◊ References.

1. Ron E, *et al.* Cancer mortality following treatment for adult hyperthyroidism. *JAMA* 1998; **280:** 347–55.
2. Franklyn JA, *et al.* Cancer incidence and mortality after radioiodine treatment for hyperthyroidism: a population-based cohort study. *Lancet* 1999; **353:** 2111–15.
3. Rivkees SA, Cornelius EA. Influence of iodine-131 dose on the outcome of hyperthyroidism in children. *Pediatrics* 2003; **111:** 745–9.

Precautions

The use of sodium iodide (^{131}I) is contra-indicated, even in diagnostic doses, during pregnancy. Sodium iodide (^{131}I) should not be given to patients with large toxic nodular goitres or to patients with severe thyrotoxic heart disease. There is some controversy as to whether radio-iodine therapy exacerbates Graves' ophthalmopathy (see Hyperthyroidism, p.2165).

Many drugs have been reported to interfere with thyroid- or other organ-function studies and checks should be made on any treatment the patient might be receiving before any estimations are carried out.

Breast feeding. The American Academy of Pediatrics has stated[1] that temporary cessation of breast feeding is required after exposure to iodine-131 since radioactivity has been reported to be present in breast milk for 2 to 14 days; high doses used for the treatment of thyroid cancer may prolong exposure to the infant.

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108:** 776–89. Correction. *ibid.*; 1029. Also available at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776 (accessed 01/07/04)

Uses and Administration

Iodine radioisotopes are mainly used in studies of thyroid function and in the treatment of hyperthyroidism (p.2165) and some forms of thyroid carcinoma (p.674).

Iodine radioisotopes can be incorporated into many compounds including liothyronine and levothyroxine, triglycerides and fatty acids, such as glyceryl trioleate and oleic acid, and proteins, such as iodinated human albumin, with varying degrees of stability and with little or no change in the biological activity of the labelled molecule. It is common practice to saturate the thyroid with non-radioactive iodine when uptake of radiation by the gland is not desired (see Radiation Protection, p.2171).

Sodium iodide (^{131}I) is given orally and by intravenous injection in studies of thyroid function, particularly in measurements of the uptake of iodine by the thyroid, and in thyroid scanning. It is also used in the treatment of hyperthyroidism and in the treatment of malignant neoplasms of the thyroid.

Injections containing iobenguane (^{131}I) (*m*-iodobenzylguanidine (^{131}I)) may be used for the localisation and treatment of phaeochromocytoma (p.1179) and neuroblastoma (p.674).

Human albumin iodinated with iodine-131 is used in the determination of the blood or plasma volume.

Sodium iodohippurate (^{131}I) is used intravenously for renal-function tests and for renal imaging.

Rose bengal sodium (^{131}I) has been given intravenously in tests of liver function.

Iodinated (^{131}I) norcholesterol (6β-iodomethyl-19-norcholest-5(10)-en-3β-ol (^{131}I)) has been used for adrenal scintigraphy by slow intravenous injection.

Various monoclonal antibodies labelled with iodine-131 are used for the detection of malignant neoplasms and some are used for therapeutic purposes, such as iodine (^{131}I) tositumomab for non-Hodgkin's lymphoma.

Preparations

Ph. Eur.: Iobenguane(I) Injection for Diagnostic Use; Iobenguane(I) Injection for Therapeutic Use; Iodinated(I) Norcholesterol Injection; Sodium Iodide(I) Capsules for Diagnostic Use; Sodium Iodide(I) Capsules for Therapeutic Use; Sodium Iodide(I) Solution; Sodium Iodide(I) Solution for Radiolabelling; Sodium Iodohippurate(I) Injection;
USP 31: Iobenguane I 131 Injection; Iodinated I 131 Albumin Aggregated Injection; Iodinated I 131 Albumin Injection; Iodohippurate Sodium I 131 Injection; Rose Bengal Sodium I 131 Injection; Sodium Iodide I 131 Capsules; Sodium Iodide I 131 Solution.

Proprietary Preparations (details are given in Part 3)
Cz.: Capsion; Curicap; Hippuran; Lipiocis†; Theracap; ***Neth.:*** Capsion; Jobenguaan; MIBG; Theracap; ***Port.:*** Capsion; Curicap; Theracap; ***Spain:*** Curicap; ***UK:*** Capsion; Theracap; ***USA:*** Bexxar; Hicon; Iodotope.

Iron-59

Hierro 59.

CAS — 14596-12-4.
ATC — V09XX04 (ferric citrate (^{59}Fe)).
ATC Vet — QV09XX04 (ferric citrate (^{59}Fe)).

HALF-LIFE. 44.6 days.

Profile

Iron-59, in the form of ferrous citrate (^{59}Fe) or ferric citrate (^{59}Fe), has been used by intravenous injection in the measurement of iron absorption and utilisation. Ferric chloride (^{59}Fe) has been given for the same purpose.

Krypton-81m

Criptón 81m.

CAS — 15678-91-8.
ATC — V09EX01 (krypton gas (^{81m}Kr)).
ATC Vet — QV09EX01 (krypton gas (^{81m}Kr)).

HALF-LIFE. 13.1 seconds.

Profile

Krypton-81m is a daughter of rubidium-81 (^{81}Rb, half-life 4.58 hours), and is prepared immediately before use by elution from a generator containing rubidium-81 adsorbed on a suitable ion-exchange column using air or oxygen as the eluent. Krypton-81m is used as a gas in lung ventilation studies. Such ventilation studies can be combined with lung perfusion studies to diagnose pulmonary embolism.

Preparations

Ph. Eur.: Krypton(Kr) Inhalation Gas;
USP 31: Krypton Kr 81m.

Proprietary Preparations (details are given in Part 3)
Cz.: KryptoScan; ***Neth.:*** KryptoScan.

Nitrogen-13

Nitrógeno 13.

CAS — 13981-22-1.

HALF-LIFE. 9.96 minutes.

Profile

Nitrogen-13 is a positron-emitting radionuclide that is used in positron-emission tomography (see Emissions from Radioisotopes, p.2052). In the form of ammonia (^{13}N) it is given intravenously for imaging blood flow in organs such as the heart, brain, and liver. Nitrogen gas (^{13}N) may be used for pulmonary ventilation studies.

Preparations

Ph. Eur.: Ammonia(N) Injection;
USP 31: Ammonia N 13 Injection.

Oxygen-15

Oxígeno 15.

CAS — 13982-43-9.

HALF-LIFE. 2 minutes.

Profile

Oxygen-15 is a positron-emitting radionuclide used in positron-emission tomography (see Emissions from Radioisotopes, p.2052). It is used in the form of water (^{15}O) and is given intravenously to study cerebral and myocardial perfusion.

Oxygen gas, carbon dioxide, and carbon monoxide have also been labelled with oxygen-15.

Preparations

Ph. Eur.: Carbon Monoxide(O); Oxygen(O); Water(O) Injection;
USP 31: Water O 15 Injection.

Phosphorus-32

Fósforo 32.

CAS — 14596-37-3.
ATC — V10AX01 (phosphorus chromic phosphate colloid (^{32}P)); V10XX01 (sodium phosphate (^{32}P)).
ATC Vet — QV10AX01 (phosphorus chromic phosphate colloid (^{32}P)); QV10XX01 (sodium phosphate (^{32}P)).

HALF-LIFE. 14.3 days.

Profile

Phosphorus-32, given as sodium phosphate (^{32}P), is used intravenously in the treatment of polycythaemia vera (p.654). Phosphorus-32 is taken up by the rapidly proliferating haematopoietic cells sufficiently to reduce their reproduction. Sodium phosphate (^{32}P) has also been used intravenously in the treatment of chronic myeloid (p.653) and chronic lymphocytic leukaemia (p.653) and in the palliative treatment of bone metastases.

Chromic phosphate (^{32}P) is given intraperitoneally or intrapleurally in the treatment of malignant effusions (p.659); it may also be given by interstitial injection for the treatment of ovarian (p.670) or prostatic carcinoma (p.671).

Preparations

Ph. Eur.: Sodium Phosphate(P) Injection;
USP 31: Chromic Phosphate P 32 Suspension; Sodium Phosphate P 32 Solution.

Proprietary Preparations (details are given in Part 3)
USA: Phosphocol.

Rhenium-186

Renio 186.

CAS — 14998-63-1.
ATC — V10AX05 (rhenium sulfide colloid (^{186}Re)); V10BX03 (rhenium etidronate (^{186}Re)).
ATC Vet — QV10AX05 (rhenium sulfide colloid (^{186}Re)); QV10BX03 (rhenium etidronate (^{186}Re)).

HALF-LIFE. 90.6 hours.

Profile

Rhenium-186 has been used in colloidal form for the treatment of arthritic joint conditions. Rhenium (^{186}Re) etidronate is used for the palliation of painful bone metastases of prostate cancer. Etidronate labelled with another isotope, rhenium-188, has also been used. Monoclonal antibodies labelled with rhenium-186 have been investigated for the treatment of various malignant neoplasms.

Preparations

Proprietary Preparations (details are given in Part 3)
Cz.: Nanocis; RE-186-MM-1; Re-Bone.

Rubidium-82

Rubidio 82.

CAS — 14391-63-0.

HALF-LIFE. 75 seconds.

Profile

Rubidium-82 is a positron-emitting radionuclide that is used in positron-emission tomography (see Emissions from Radioisotopes, p.2052). Rubidium chloride (^{82}Rb) is given intravenously for cardiac imaging.

Preparations

USP 31: Rubidium Chloride Rb 82 Injection.

Samarium-153

Samario 153.

CAS — 15766-00-4.
ATC — V10AX02 (samarium hydroxyapatite colloid (^{153}Sm)); V10BX02 (samarium lexidronam (^{153}Sm)).
ATC Vet — QV10AX02 (samarium hydroxyapatite colloid (^{153}Sm)); QV10BX02 (samarium lexidronam (^{153}Sm)).

HALF-LIFE. 47 hours.

Profile

Samarium-153, in the form of samarium (^{153}Sm) lexidronam (samarium (^{153}Sm) EDTMP) is used for the palliative treatment of painful bone metastases (p.660). It is given by intravenous injection.

◊ References.

1. Sartor O, *et al.* Samarium-153-lexidronam complex for treatment of painful bone metastases in hormone-refractory prostate cancer. *Urology* 2004; **63:** 940–5.

Preparations

USP 31: Samarium Sm 153 Lexidronam Injection.

Proprietary Preparations (details are given in Part 3)
Austral.: Quadramet†; ***Cz.:*** Quadramet; ***Fr.:*** Quadramet†; ***Ital.:*** Quadramet; ***Neth.:*** Quadramet; ***Port.:*** Quadramet; ***Spain:*** Quadramet; ***UK:*** Quadramet; ***USA:*** Quadramet.

Selenium-75

Selenio 75.

CAS — 14265-71-5.
ATC — V09DX01 (selenium tauroselcholic acid (^{75}Se)); V09XX03 (selenium norcholesterol (^{75}Se)).
ATC Vet — QV09DX01 (selenium tauroselcholic acid (^{75}Se)); QV09XX03 (selenium norcholesterol (^{75}Se)).

HALF-LIFE. 118.5 days.

Profile

Selenium-75 in the form of tauroselcholic acid (^{75}Se) (^{75}SeHCAT) is used orally in the measurement of bile acid absorption for the assessment of ileal function.

Selenium-75 in the form of 6β-[(methyl[^{75}Se]seleno)methyl]-19-norcholest-5(10)-en-3β-ol (selenonorcholestenol (^{75}Se)) has been used intravenously in adrenal scintigraphy.

Preparations

Proprietary Preparations (details are given in Part 3)
Neth.: SeHCAT; ***UK:*** Scintadren.

Strontium-89

Estroncio 89.

CAS — 14158-27-1.
ATC — V10BX01 (strontium chloride (^{89}Sr)).
ATC Vet — QV10BX01 (strontium chloride (^{89}Sr)).

HALF-LIFE. 50.5 days.

Profile

Strontium-89, in the form of strontium chloride (^{89}Sr), is used for the palliation of pain in patients with bone metastases (p.660); it is given intravenously.

◊ References.

1. Robinson RG, *et al.* Strontium 89 therapy for the palliation of pain due to osseous metastases. *JAMA* 1995; **274:** 420–4.

Preparations

Ph. Eur.: Strontium(Sr) Chloride Injection;
USP 31: Strontium Chloride Sr 89 Injection.

Proprietary Preparations (details are given in Part 3)
Austral.: Metastron; ***Austria:*** Metastron; ***Cz.:*** Metastron; ***Fr.:*** Metastron; ***Ital.:*** Metastron; ***Neth.:*** Metastron; ***Port.:*** Metastron; ***Spain:*** Metastron; ***UK:*** Metastron; ***USA:*** Metastron.

Technetium-99m

Tecnecio 99m.

CAS — 14133-76-7 (technetium-99).
ATC — V09AA01 (technetium exametazime (^{99m}Tc)); V09AA02 (technetium bicisate (^{99m}Tc)); V09BA01 (technetium oxidronate (^{99m}Tc)); V09BA02 (technetium medronate (^{99m}Tc)); V09BA03 (technetium pyrophosphate (^{99m}Tc)); V09BA04 (technetium butedronate (^{99m}Tc)); V09CA01 (technetium pentetate (^{99m}Tc)); V09CA02 (technetium succimer (^{99m}Tc)); V09CA03 (technetium mertiatide (^{99m}Tc)); V09CA04 (technetium gluceptate (^{99m}Tc)); V09CA05 (technetium gluconate (^{99m}Tc)); V09DA01 (technetium disofenin (^{99m}Tc)); V09DA02 (technetium etifenin (^{99m}Tc)); V09DA03 (technetium lidofenin (^{99m}Tc)); V09DA04 (technetium mebrofenin (^{99m}Tc)); V09DA05 (technetium galtifenin (^{99m}Tc)); V09DB01 (technetium nanocolloid (^{99m}Tc)); V09DB02 (technetium microcolloid (^{99m}Tc)); V09DB03 (technetium millimicrospheres (^{99m}Tc)); V09DB04 (technetium tin colloid (^{99m}Tc)); V09DB05 (technetium sulfur colloid (^{99m}Tc)); V09DB06 (technetium rhenium sulfide colloid (^{99m}Tc)); V09DB07 (technetium phytate (^{99m}Tc)); V09EA01 (technetium pentetate (^{99m}Tc)); V09EA02 (technetium technegas (^{99m}Tc)); V09EA03 (technetium nanocolloid (^{99m}Tc)); V09EB01 (technetium macrosalb (^{99m}Tc)); V09EB02 (technetium microspheres (^{99m}Tc)); V09FX01 (technetium pertechnetate (^{99m}Tc)); V09GA01 (technetium sestamibi (^{99m}Tc)); V09GA02 (technetium tetrofosmin (^{99m}Tc)); V09GA03 (technetium teboroxime (^{99m}Tc)); V09GA04 (technetium human albumin (^{99m}Tc)); V09GA05 (technetium furifosmin (^{99m}Tc)); V09GA06 (technetium stannous agent labelled cells (^{99m}Tc)); V09GA07 (technetium apcitide (^{99m}Tc)); V09HA01 (technetium human immunoglobulin (^{99m}Tc)); V09HA02 (technetium exametazime labelled cells