- electron capture (EC)–a mode of radioactivity decay involving the capture of an orbital electron by its nucleus
- gamma-radiation–electromagnetic radiation emitted in the process of a change in configuration of a nucleus or particle annihilation and having wavelengths shorter than those of X-rays
- gray (Gy)–the SI unit of absorbed dose, defined as 1 J/kg. The rad was formerly used as the unit of absorbed dose. 1 Gy = 100 rads
- isomeric transition (IT)–the decay of one isomer to another having a lower energy state. The transition is accompanied by the emission of gamma-radiation
- isomers–nuclides with the same mass number and atomic number but with nuclei having different energy states
- isotopes–nuclides with the same atomic number but different mass numbers
- nuclide–a species of atom having a specific mass number, atomic number, and nuclear energy state
- photon–a quantum of electromagnetic radiation
- positron–a positive beta particle
- rad (radiation absorbed dose)–now superseded as a unit of absorbed dose by the gray. A rad is equal to 10^{-2} J/kg. The röntgen and the rad in soft tissue are approximately equivalent in magnitude for moderate energies. 1 rad = 10^{-2} Gy
- radioactive decay–the spontaneous change of a nucleus resulting in the emission of a particle or a photon
- radioactivity–the property of certain nuclides of spontaneously emitting particles or photons or of undergoing spontaneous fission
- radioisotope–an isotope that is radioactive
- radionuclide–a nuclide that is radioactive
- rem (röntgen-equivalent-man)–now superseded as a unit of dose equivalent by the sievert (Sv). A rem is numerically equal to the absorbed dose in rads multiplied by the appropriate quality factor defining the biological effect and by any other modifying factors. The sievert is the joule/kg (J kg^{-1}) equal to 100 rem
- röntgen (R)–a unit of exposure of X- or gamma-radiation, equal to 2.58×10^{-4} coulombs/kg in air; superseded by the SI unit of exposure, the coulomb/kg (C kg^{-1}). 1 C kg^{-1} = 3.876×10^3 R
- sievert (Sv)–the SI unit of dose equivalent numerically equal to the absorbed dose in grays multiplied by the appropriate quality factor defining the biological effect and by any other modifying factors expressed in J/kg
- specific activity–the activity per unit mass of a material containing a radioactive substance
- X-rays–electromagnetic radiation other than annihilation radiation originating in the extranuclear part of the atom and having wavelengths much shorter than those of visible light

Carbon-11

Carbono 11.

CAS — 14333-33-6.

HALF-LIFE. 20.4 minutes.

Profile

Carbon-11 is a positron-emitter that is used in positron-emission tomography (see Emissions from Radioisotopes, p.2052). Compounds that have been labelled with carbon-11 include L-methionine for the detection of malignant neoplasms, acetic and palmitic acids for the study of myocardial metabolism, raclopride and mespiperone for the study of CNS dopaminergic D_2 receptors, and flumazenil for the study of GABA receptors. Labelled carbon monoxide may be used to assess blood volume.

Preparations

Ph. Eur.: -Methionine ((C)Methyl) Injection; Flumazenil (N-(C)Methyl) Injection; Raclopride ((C)Methoxy) Injection; Sodium Acetate ((1- C)) Injection;
USP 31: Carbon Monoxide C 11; Flumazenil C 11 Injection; Mespiperone C 11 Injection; Methionine C 11 Injection; Raclopride C 11 Injection; Sodium Acetate C 11 Injection.

Carbon-14

Carbono 14.

CAS — 14762-75-5.

HALF-LIFE. 5730 years.

Profile

Carbon-14 has been used to label many organic compounds that may be employed in breath tests.

Urea (p.1620) labelled with carbon-14 is used in a breath test to detect *Helicobacter pylori* as an aid in the diagnosis of peptic ulcer disease (p.1702).

Preparations

USP 31: Urea C 14 Capsules.

Proprietary Preparations (details are given in Part 3)
Cz.: HeliCap; ***Neth.:*** HeliCap; ***Port.:*** HeliCap; ***USA:*** Pytest.

Chromium-51

Cromo 51.

CAS — 14392-02-0.
ATC — V09CX04 (chromium edetate (^{51}Cr)).
ATC Vet — QV09CX04 (chromium edetate (^{51}Cr)); QV09GX03 (chromate labelled cells (^{51}Cr)).

HALF-LIFE. 27.7 days.

Profile

Chromium-51, as sodium chromate (^{51}Cr), is used to label red blood cells so that red cell survival and red cell volume can be measured. Chromium-51 activity in the faeces can be used to estimate gastrointestinal blood losses. Red blood cells labelled with chromium-51 and damaged by heat before re-injection have been used for spleen scanning.

As chromium edetate (^{51}Cr) given intravenously, chromium-51 is used in the determination of the glomerular filtration rate.

As chromic chloride (^{51}Cr), chromium-51 has been given intravenously for the determination of loss of serum protein into the gastrointestinal tract.

Preparations

Ph. Eur.: Chromium(Cr) Edetate Injection; Sodium Chromate(Cr) Sterile Solution;
USP 31: Chromium Cr 51 Edetate Injection; Sodium Chromate Cr 51 Injection.

Cobalt-57

Cobalto 57.

CAS — 13981-50-5.
ATC — V09XX01 (cobalt cyanocobalamin (^{57}Co)).
ATC Vet — QV09XX01 (cobalt cyanocobalamin (^{57}Co)).

HALF-LIFE. 271 days.

Profile

Cobalt-57, in the form of an aqueous solution or capsules of cyanocobalamin (^{57}Co), is given orally for the measurement of absorption of vitamin B_{12} in the diagnosis of pernicious anaemia and other malabsorption syndromes. It is also used with cyanocobalamin (^{58}Co), see below.

Preparations

Ph. Eur.: Cyanocobalamin(Co) Capsules; Cyanocobalamin(Co) Solution;
USP 31: Cyanocobalamin Co 57 Capsules; Cyanocobalamin Co 57 Oral Solution.

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Cz.:*** Dicopac†; ***UK:*** Dicopac.

Cobalt-58

Cobalto 58.

CAS — 13981-38-9.
ATC — V09XX02 (cobalt cyanocobalamin (^{58}Co)).
ATC Vet — QV09XX02 (cobalt cyanocobalamin (^{58}Co)).

HALF-LIFE. 70.8 days.

Profile

Cobalt-58, in the form of an aqueous solution or capsules of cyanocobalamin (^{58}Co), is given orally for the measurement of absorption of vitamin B_{12} in the diagnosis of pernicious anaemia and other malabsorption syndromes.

The different emissions of cobalt-57 and cobalt-58 allow the isotopes to be distinguished. This can be used to differentiate between failure of absorption due to lack of intrinsic factor (pernicious anaemia) and that due to ileal malabsorption, by giving both free cyanocobalamin (^{58}Co) and cyanocobalamin (^{57}Co) bound to intrinsic factor. A dual isotope kit has been used for this purpose.

Preparations

Ph. Eur.: Cyanocobalamin(Co) Capsules; Cyanocobalamin(Co) Solution;
USP 31: Cyanocobalamin Co 58 Capsules.

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Cz.:*** Dicopac†; ***UK:*** Dicopac.

Erbium-169

CAS — 15840-13-8.
ATC — V10AX04 (erbium citrate colloid (^{169}Er)).
ATC Vet — QV10AX04 (erbium citrate colloid (^{169}Er)).

HALF-LIFE. 9.4 days.

Profile

Erbium-169 is a radionuclide that has been used in the treatment of arthritic conditions particularly of the small joints.

Preparations

Proprietary Preparations (details are given in Part 3)
Cz.: Ermm-1.

Fluorine-18

Flúor 18.

CAS — 13981-56-1.
ATC — V09IX04 (fludeoxyglucose (^{18}F)).
ATC Vet — QV09IX04 (fludeoxyglucose (^{18}F)).

HALF-LIFE. 110 minutes.

Profile

Fluorine-18 is a positron-emitting radionuclide that is used in positron-emission tomography (see Emissions from Radioisotopes, p.2052).

Fludeoxyglucose (^{18}F) (2-deoxy-2-fluoro-^{18}F-α-D-glucopyranose; ^{18}F-fluorodeoxyglucose) is given by intravenous injection for the assessment of cerebral and myocardial glucose metabolism in various physiological or pathological states including stroke and myocardial ischaemia. It is also used for the detection of malignant tumours including those of the brain, liver, lung, and thyroid gland. Fluorodopa (^{18}F) is also used in cerebral imaging. Sodium fluoride (^{18}F) is used in bone scanning.

Preparations

Ph. Eur.: Fludeoxyglucose (F) Injection; Sodium Fluoride (F) Injection;
USP 31: Fludeoxyglucose F 18 Injection; Fluorodopa F 18 Injection; Sodium Fluoride F 18 Injection.

Proprietary Preparations (details are given in Part 3)
Austria: 18F-FDG; Efdege; Flucis; ***Cz.:*** Efdege; FDG Scan; ***Hung.:*** Pozitron-Scan-FDG; ***Neth.:*** Efdege; Flucis; Glucotrace; ***Port.:*** Contracer; Flucis; Steripet; ***Spain:*** Farna FDG; FDG Scan; Fluodos; Fluorscan; Fluotracer.

Gallium-67

Galio 67.

CAS — 14119-09-6.
ATC — V09HX01 (gallium citrate (^{67}Ga)).
ATC Vet — QV09HX01 (gallium citrate (^{67}Ga)).

HALF-LIFE. 3.26 days.

Profile

Gallium-67 is used in the form of an intravenous injection of gallium citrate (^{67}Ga).

Gallium citrate (^{67}Ga) is concentrated in some malignant tumours of the lymphatic system, as well as in some other tissues, and is used for tumour visualisation. Concentration also occurs in inflammatory lesions and the injection is therefore used for the localisation of focal inflammatory sites, such as may occur in abscesses, osteomyelitis, or sarcoidosis. Gallium scans have proved useful for the detection of the various infections and malignancies that may be encountered in patients with AIDS.

Breast feeding. The American Academy of Pediatrics has stated[1] that temporary cessation of breast feeding is required after exposure to gallium-67 since radioactivity has been reported to be present in breast milk for 2 weeks.

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.: Gallium(Ga) Citrate Injection;
USP 31: Gallium Citrate Ga 67 Injection.

Gold-198

Oro 198.

CAS — 10043-49-9.
ATC — V10AX06 (colloidal gold (^{198}Au)).
ATC Vet — QV10AX06 (colloidal gold (^{198}Au)).

HALF-LIFE. 65 hours (2.7 days).

Profile

Gold-198, as colloidal gold (^{198}Au) with most of the activity associated with particles of diameter 5 to 20 nm, has been used by intrapleural or intraperitoneal injection in the treatment of malignant ascites and malignant pleural effusion, and by intravenous injection for the measurement of liver blood flow, in liver scanning, and for general investigations of the reticuloendothelial

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).