

Diagnostics

Ophthalmic drugs

For general information on the use of eye drops, see section 21.

Fluorescein sodium is used in ocular diagnostic procedures and for locating damaged areas of the cornea due to injury or disease.

Tropicamide is a short-acting relatively weak mydriatic that dilates the pupil and paralyses the ciliary muscle. It facilitates the examination of the fundus of the eye.

Fluorescein sodium

Eye drops , solution , fluorescein sodium 1%

Uses:

detection of lesions and foreign bodies in the eye

Contraindications:

avoid use with soft contact lenses

Precautions:

Skilled tasks.

Transient blurring of vision—advise patient not to operate machinery or drive until vision is clear

Administration:

Detection of lesions and foreign bodies in eye, *by ocular instillation* , **ADULT** and **CHILD** instil sufficient solution dropwise to stain damaged area

Tropicamide

Tropicamide is a representative mydriatic. Various drugs can serve as alternatives

Eye drops, solution , tropicamide 0.5%

Uses:

dilatation of the pupil to examine the fundus

Precautions:

patients aged over 60 years and hypermetropic (long-sighted)—may precipitate acute angle-closure glaucoma; darkly pigmented iris, more resistant to pupillary dilatation—exercise caution to avoid overdose

Skilled tasks.

Avoid operating machinery or driving for 1–2 hours after mydriasis

Administration:

Dilatation of pupil to examine the fundus, *by ocular instillation* , **ADULT** and **CHILD** 1 drop, 15–20 minutes before examination of eye

Adverse effects:

transient stinging and raised intraocular pressure; on prolonged administration—local irritation, hyperaemia, oedema and conjunctivitis

Radiocontrast media

Radiographic contrast media are needed for delineating soft tissue structures such as blood vessels, stomach, bowel loops and body cavities not otherwise visualized by standard X-ray examination. The contrast media in this group containing heavy atoms (metal or iodine) absorb a significantly different amount of X-rays than the surrounding soft tissue, thereby making the examined structures visible on radiographs.

Barium sulfate is a metal salt which is used to delineate the gastrointestinal tract. It is not absorbed by the body and does not interfere with stomach or bowel secretion or produce misleading radiographic artefacts. Barium sulfate may be used in either single- or double-contrast techniques or computer-assisted axial tomography. For double contrast examination gas can be introduced into the gastrointestinal tract by using suspensions of barium sulfate containing carbon dioxide or by using separate gas-producing preparations based on sodium bicarbonate. Air administered through a gastrointestinal tube can be used as an alternative to carbon dioxide to achieve a double-contrast effect.

Amidotrizoates (meglumine amidotrizoate and sodium amidotrizoate) are iodinated ionic monomeric organic compounds. Both salts have been used alone in diagnostic radiography including computer-assisted axial tomography but a mixture of both is often preferred to minimize adverse effects and to improve the quality of the examination.

Amidotrizoates are used in a wide range of procedures including urography and examination of the gallbladder, biliary ducts and spleen. Owing to their high osmolality and the resulting hypertonic solutions, they are associated with a high incidence of adverse effects.

Radiodensity depends on iodine concentration, and osmolality depends on number of particles in a given weight of solvent. The osmolality for a given radiodensity can be reduced by using an ionic dimeric medium such as **meglumine iotroxate** which contains twice the number of iodine atoms in a molecule or by using a non-ionic medium such as **iohexol**. Low osmolality media such as iohexol are associated with a reduction in some adverse effects (see below), but they are generally more expensive. Iohexol is used for a wide range of diagnostic procedures including urography, angiography and arthrography and also in computer-assisted axial tomography. **Iopanoic acid** is an oral iodinated ionic monomeric organic compound. It is absorbed from the gastrointestinal tract, excreted into the bile and concentrated in the gallbladder thus making it ideal for cholecystography. **Propyliodone** is an iodinated organic compound which is used for the examination of the bronchial tract. **Meglumine iotroxate** is excreted into the bile after intravenous administration and used for cholecystography and cholangiography.

HYPERSENSITIVITY

Anaphylactoid reactions to iodinated radiocontrast media are more common with ionic, high osmolality compounds. Patients with a history of asthma or allergy, drug hypersensitivity, adrenal suppression, heart disease, previous reaction to contrast media, and those receiving beta-adrenoceptor antagonists (beta-blockers) are at increased risk. Non-ionic media are preferred for these patients and beta-blockers should be discontinued if possible.

Amidotrizoates

Amidotrizoates are representative iodinated ionic monomeric contrast media. Various media can serve as alternatives

Injection (Solution for injection), iodine (as sodium and/or meglumine amidotrizoate) 140–420 mg/ml, 20-ml ampoules

Uses:

urography, venography, operative cholangiography, splenoportography, arthrography, diskography; computer-assisted axial tomography

Contraindications:

hypersensitivity to iodine-containing compounds

Precautions:

history of allergy, atopy or asthma; severe hepatic impairment; renal impairment (Appendix 4); dehydration—correct fluid and electrolyte balance before administration; multiple myeloma (risk if dehydrated, may precipitate fatal renal failure); cardiac disease, hypertension, phaeochromocytoma, sickle-cell disease, hyperthyroidism, elderly, debilitated or children—increased risk of adverse effects; pregnancy; breastfeeding; may interfere with thyroid-function tests; biguanides (withdraw 48 hours before administration; restart when renal function stabilized); **important:** because of risk of hypersensitivity reactions, adequate resuscitation facilities must be immediately available when radiographic procedures are carried out

Dosage:

Diagnostic radiography, **ADULT** and **CHILD**, route and dosage depend on procedure and preparation used (consult manufacturer's literature)

Administration. Only by specialist radiographers, according to manufacturer's directions

Adverse effects:

nausea, vomiting, diarrhoea, metallic taste, flushing, sensations of heat, weakness, dizziness, headache, coughing, rhinitis, sweating, sneezing, lacrimation, visual disturbances, pruritus, salivary gland enlargement, pallor, cardiac disorders, haemodynamic disturbances and hypotension; disseminated intravascular coagulation; fibrinolysis and depression of blood coagulation factors; rarely, convulsions, paralysis, coma, rigors, arrhythmias, pulmonary oedema, circulatory failure and cardiac arrest; occasionally anaphylactoid or hypersensitivity reactions; hyperthyroidism; pain on injection; extravasation may result in tissue damage, thrombophlebitis, thrombosis, venospasm and embolism

Barium sulfate

Oral suspension (or Rectal suspension), barium sulfate 30 to 200% w/v

Uses:

radiographic examination of the gastrointestinal tract (see notes above)

Contraindications:

intestinal obstruction, conditions such as pyloric stenosis or lesions which predispose to obstruction; intestinal perforation or conditions with risk of perforation, such as acute ulcerative

colitis, diverticulitis, or after rectal or colonic biopsy, sigmoidoscopy or radiotherapy

Precautions:

adequate hydration after procedure to prevent severe constipation

Dosage:

Radiographic examination of gastrointestinal tract, **ADULT** and **CHILD**, route and dosage depend on procedure and preparation used (consult manufacturer's literature)

Administration. Only by specialist radiographers, according to manufacturer's directions

Adverse effects:

constipation or diarrhoea, abdominal cramps and bleeding; perforation of bowel resulting in peritonitis, adhesions, granulomas and high mortality rate; electrocardiographical changes—may occur with rectal administration; pneumonitis or granuloma formation—following accidental aspiration into lungs

Iohexol

Iohexol is a representative iodinated non-ionic contrast medium. Various media can serve as alternatives

Injection (Solution for injection), iodine (as iohexol) 140–350 mg/ml, 5-ml, 10-ml, and 20-ml ampoules

Uses:

urography, venography, angiography, ventriculography, operative cholangiography, splenoportography, arthrography, diskography; computer-assisted axial tomography

Contraindications:

hypersensitivity to iodine-containing compounds

Precautions:

history of allergy, atopy or asthma; severe hepatic impairment; renal impairment (Appendix 4); dehydration—correct fluid and electrolyte balance before administration; multiple myeloma (risk if dehydrated, may precipitate fatal renal failure); cardiac disease, hypertension, phaeochromocytoma, sickle-cell disease, hyperthyroidism, elderly, debilitated or children—increased risk of adverse effects; pregnancy; breastfeeding; may interfere with thyroid-function tests; biguanides (withdraw 48 hours before administration; restart when renal function stabilized);

important: because of risk of hypersensitivity reactions, adequate resuscitation facilities must be immediately available when radiographic procedures are carried out

Dosage:

Diagnostic radiography, **ADULT** and **CHILD**, route and dosage depend on procedure and preparation used (consult manufacturer's literature)

Administration. Only by specialist radiographers, according to manufacturer's directions

Adverse effects:

(see also notes above); nausea, vomiting, metallic taste, flushing, sensations of heat, weakness, dizziness, headache,

coughing, rhinitis, sweating, sneezing, lacrimation, visual disturbances, pruritus, salivary gland enlargement, pallor, cardiac disorders, haemodynamic disturbances and hypotension; rarely, convulsions, paralysis, coma, rigors, arrhythmias, pulmonary oedema, circulatory failure and cardiac arrest; occasionally anaphylactoid or hypersensitivity reactions; hyperthyroidism; pain on injection; extravasation may result in tissue damage, thrombophlebitis, thrombosis, venospasm and embolism

Iopanoic acid

Iopanoic acid is a representative iodinated ionic monomeric contrast medium. Various media can serve as alternatives

Tablets , iopanoic acid 500 mg

Uses:

examination of the gallbladder and biliary tract

Contraindications:

severe renal disease and hepatic disease (Appendices 4 and 5); jaundice caused by biliary-tract obstruction; impaired absorption due to acute gastrointestinal disorders

Precautions:

hypersensitivity to iodine-containing compounds or other contrast media; severe hyperthyroidism, hyperuricaemia or cholangitis; may interfere with thyroid-function tests;

important: because of risk of hypersensitivity reactions, adequate resuscitation facilities must be immediately available when radiographic procedures are carried out

Dosage:

Examination of gallbladder and biliary tract, *by mouth* ,

ADULT 3 g with plenty of water 10–14 hours before examination; if examination needs to be repeated, a further 3 g on the same day; alternatively, repeat examination carried out after 5–7 days with single 6-g dose (maximum dose; 6 g over 24 hours; avoid doses over 3 g in renal impairment)

Administration. Only by specialist radiographers, according to manufacturer's directions

Adverse effects:

nausea and vomiting, abdominal pain and diarrhoea; mild stinging on micturition, rashes and flushing; acute renal failure, thrombocytopenia and hypersensitivity reactions reported; also uricosuric and anticholinesterase effects

Meglumine iotroxate

Meglumine iotroxate is a representative iodinated ionic dimeric contrast medium. Various media can serve as alternatives. It is a complementary drug

Injection (Solution for injection), iodine 50 mg/ml (as meglumine iotroxate 105 mg/ml), 100-ml bottle

Uses:

examination of the gallbladder and biliary tract

Contraindications:

hypersensitivity to iodine-containing compounds

Precautions:

history of allergy, atopy or asthma; severe hepatic impairment; renal impairment (Appendix 4); dehydration—correct fluid and electrolyte balance before administration; multiple myeloma (risk if dehydrated, may precipitate fatal renal failure); cardiac disease, hypertension, phaeochromocytoma, sickle-cell disease, hyperthyroidism, elderly, debilitated or children—increased risk of adverse effects; pregnancy; breastfeeding; may interfere with thyroid-function tests; biguanides (withdraw 48 hours before administration; restart when renal function stabilized); **important:** because of risk of hypersensitivity reactions, adequate resuscitation facilities must be immediately available during radiographic procedures

Dosage:

Examination of gallbladder and biliary tract, *by intravenous injection*, **ADULT** 100 ml of meglumine iotroxate 10.5% solution over at least 15 minutes (consult manufacturer's literature)

Administration. Only by specialist radiographers, according to manufacturer's directions

Adverse effects:

nausea, vomiting, metallic taste, flushing, sensations of heat, weakness, dizziness, headache, cough, rhinitis, sweating, sneezing, lacrimation, visual disturbances, pruritus, salivary gland enlargement, pallor, cardiac disorders, haemodynamic disturbances and hypotension or hypertension; rarely, convulsions, paralysis, coma, rigors, arrhythmias, pulmonary oedema, circulatory failure and cardiac arrest; occasionally anaphylactoid or hypersensitivity reactions; hyperthyroidism; pain on injection; extravasation may result in tissue damage, thrombophlebitis, thrombosis, venospasm and embolism

Propyliodone

Propyliodone is a representative iodinated organic contrast medium. Various drugs can serve as alternatives

Oily suspension, propyliodone 600 mg/ml, 20-ml ampoule

Uses:

examination of the bronchial tree (use only if no other alternative available)

Contraindications:

hypersensitivity to iodine-containing compounds; severe heart disease

Precautions:

asthma, bronchiectasis, pulmonary emphysema or reduced pulmonary function; use of excessive volume or too rapid administration may result in lobar collapse; may interfere with thyroid-function tests; **important:** because of risk of hypersensitivity reactions, adequate resuscitation facilities must be immediately available when radiographic procedures are carried out

Dosage:

Examination of bronchial tree, *by instillation into the lungs* ,
ADULT dose, consult manufacturer's literature

Administration. Only by specialist radiographers, according to manufacturer's directions

Adverse effects:

pyrexia, malaise, arthralgia, cough; occasionally, dyspnoea,
atelectasis, pneumonia; rarely, hypersensitivity reactions