IOPROMIDE (Systemic)

Introduction

VA CLASSIFICATION (Primary)¾DX101

Commonly used brand name(s):Ultravist 150; Ultravist 240; Ultravist 300; Ultravist 370.

Note: For a listing of dosage forms and brand names by country availability, see Dosage Forms section(s).

Category

Diagnostic aid, radiopaque (cardiac disease; vascular disease; urinary tract disorders); Diagnostic aid, radiopaque contrast enhancer in computed tomography.

Note: Iopromide is a nonionic radiopaque contrast agent. 1

Indications

Accepted

Arteriography

Aortography

Angiography or

Venography¾Iopromide is indicated in cerebral arteriography to visualize arterial lesions of the brain; in coronary arteriography and left ventriculography to visualize the coronary arteries and the left ventricle; in aortography and visceral angiography to visualize the aorta and the major visceral arterial branches; in peripheral arteriography and venography to visualize the peripheral arteries and veins, respectively; and in intra-arterial digital subtraction angiography. 1

Urography, excretory¾Iopromide is indicated for excretory urography to evaluate abnormalities of the urinary tract such as urinary tract obstructions. 1

Brain imaging, computed tomographic¾Iopromide is indicated for enhancement of computed tomographic images of the brain (CT of the brain). 1

Body imaging, computed tomographic¾Iopromide is indicated for enhancement of computed tomographic images of the body (CT of the body). 1

Pharmacology/Pharmacokinetics

Physicochemical characteristics:

Molecular weight¾791.12 1

Osmolality¾Low. The osmolalities of the injections with iodine concentrations of 150, 240, 300, and 370 mg per mL are 328, 483, 607, and 774 mOsmol per kg of water, respectively 1.

Note: Iopromide injection is hypertonic compared to plasma (approximately 1.1 to 2.7 times the osmolality of plasma). 1

Mechanism of action/Effect:

Organic iodine compounds block x-rays as they pass through the body, thereby allowing the body structures containing iodine to be delineated in contrast to those structures that do not contain iodine. The degree of opacity produced by these compounds is directly proportional to the total amount (concentration and volume) of the iodinated contrast agent in the path of the x-rays. 1 After intravascular administration, iopromide makes opaque those vessels in its path of flow, allowing visualization of the internal structures until significant hemodilution occurs. 1

Distribution:

Iopromide is rapidly distributed throughout extracellular fluid following intravenous administration. There is no significant deposition in tissues. It does not cross the blood-brain barrier, but accumulates within the interstitial tissues of malignant tumors of the brain due to the alterations in the blood-brain barrier permeability caused by the tumor. 1

Protein binding:

Very low (1%). 1

Half-life:

Distribution¾
Approximately 0.24 hour. 1

Elimination¾
Main phase: Approximately 2 hours (with normal renal function). 1

Terminal: Approximately 6.2 hours. 1

Time to peak opacification

Immediate, 15 to 120 seconds, after bolus injection. 1

Renal parenchyma (calyces and pelves)¾1 to 3 minutes, with optimum contrast within 5 to 15 minutes. 1

Peak serum concentration

Immediate, but concentration falls rapidly within 5 to 10 minutes as iopromide is distributed throughout the extravascular compartment. 1

Elimination:

Renal¾Mainly by glomerular filtration; 97% of dose is eliminated unchanged during the main elimination half-life phase. 1

Fecal¾Approximately 2% of dose. 1

Note: In patients with significantly impaired renal function, the elimination of iopromide is prolonged depending upon the degree of impairment. 1

Precautions to Consider

Cross-sensitivity and/or related problems

Patients sensitive to iodine or other iodinated contrast media may be sensitive to iopromide also. 1

Carcinogenicity/Mutagenicity

Long-term animal studies to evaluate the carcinogenic potential of iopromide have not been performed. Iopromide demonstrated no mutagenic effects in the Ames test, in an in vitro human lymphocyte test for chromosomal aberrations, and in in vivo mouse studies, including the micronucleus test and dominant lethal assay. 1

Pregnancy/Reproduction

Pregnancy¾Adequate and well-controlled studies in humans have not been done. 1

Reproduction studies in rats and rabbits have not shown that iopromide, administered in doses up to 2.2 times the maximum recommended dose for a 50-kg human, causes harm to the fetus. 1

FDA Pregnancy Category B. 1

Breast-feeding

Although it is not known whether iopromide is distributed into breast milk, temporary discontinuation of breast-feeding is recommended following administration of iopromide. 1

Pediatrics

Safety and efficacy have not been established. 1

Geriatrics

Diagnostic studies performed to date have not demonstrated geriatrics-specific problems that would limit the usefulness of iopromide in the elderly. 1

Dehydration and/or the risk of renal failure may be exacerbated by iopromide in geriatric patients, especially those with polyuria, oliguria, diabetes, or pre-existing dehydration; adequate hydration is recommended before and following administration of iopromide. 1

Drug interactions and/or related problems

The following drug interactions and/or related problems have been selected on the basis of their potential clinical significance (possible mechanism in parentheses where appropriate)¾not necessarily inclusive (>> = major clinical significance):
Cholecystographic agents, oral

(may increase the risk of renal toxicity when closely followed by intravascular iopromide, especially in patients with hepatic function impairment 1)

Diagnostic interference

The following have been selected on the basis of their potential clinical significance (possible effect in parentheses where appropriate)¾not necessarily inclusive (>> = major clinical significance):With other diagnostic test results

Thyroid function determinations and

Thyroid imaging

(intravascular administration of iopromide may alter serum protein-bound iodine [PBI] concentrations and radioactive iodine or pertechnetate ion uptake for up to 2 weeks; thyroid test should be performed prior to administration of iopromide. Other thyroid function tests not based on measurement of iodine, such as resin triiodothyronine uptake, may not be affected 1)

With physiology/laboratory test values

Prothrombin time (PT) and

Thromboplastin time

(may be increased with iopromide since in vitro studies with animal blood have shown other nonionic contrast media to slightly inhibit all stages of coagulation 1)

Medical considerations/Contraindications

The medical considerations/contraindications included have been selected on the basis of their potential clinical significance (reasons given in parentheses where appropriate)¾ not necessarily inclusive (>> = major clinical significance).
Risk-benefit should be considered when the following medical problems exist

For all procedures

Allergic reaction (anaphylaxis) to penicillins or to skin allergens, previous

(risk of anaphylactoid reaction; caution is recommended when administering iopromide to patients who have had a previous reaction to penicillins or to skin allergens 1)

Allergies or asthma, history of

(risk of idiosyncratic response or anaphylactoid reaction; caution is recommended when administering iopromide to patients with a history of allergies or asthma 1)

>> Dehydration, especially associated with pre-existing renal disease, advanced vascular disease, or diabetes mellitus, or in elderly patients

(osmotic diuretic action of iopromide may exacerbate dehydration and increase risk of acute renal failure 1)

Hyperthyroidism

(administration of iopromide may precipitate thyroid storm 1)

>> Pheochromocytoma

(use of iopromide may precipitate severe hypertension; amount of iopromide injected should be kept to a minimum and blood pressure should be monitored during the procedure 1)

Renal function impairment, severe

(elimination of iopromide may be delayed 1)

>> Sensitivity to iodinated contrast media

(increased risk of anaphylactoid reaction in patients with history of prior reactions to contrast media 1)

Sickle cell disease

(iopromide may promote sickling in patients who are homozygous for sickle cell disease 1)

For angiography 1

>> Homocystinuria

(procedure may increase risk of thrombosis and embolism 1)

For venography 1

Infection, local or

Ischemia, severe or

Phlebitis or

Thrombosis or

Venous stasis or

Venous system obstruction

(procedure may cause venous inflammatory changes, thrombosis, or gangrene 1)

For excretory urography

>> Anuria or

>> Diabetes mellitus

(administration of iopromide may increase risk of acute renal failure 1)

Patient monitoring

The following may be especially important in patient monitoring (other tests may be warranted in some patients, depending on condition; >> = major clinical significance):
Blood pressure determinations

(may be required during examination, especially in patients with known or suspected pheochromocytoma or hemodynamic compromise or instability 1)

Side/Adverse Effects

Note: Most of the adverse effects are usually self-limited and of short duration. 1

Low-osmolality contrast agents, such as iopromide, are reported to cause less heat and pain on injection than high-osmolality agents, such as diatrizoates and iothalamate. 1

Thromboembolic events causing myocardial infarction and stroke have been reported during angiographic procedures with non-ionic contrast media; however, these events appear to be technique-related. 1

The following side/adverse effects have been selected on the basis of their potential clinical significance (possible signs and symptoms in parentheses where appropriate)¾not necessarily inclusive:
Those indicating need for medical attention

Incidence less frequent or rare

With all procedures

Cardiovascular effects, including atrioventricular(AV) block, (unusual weakness, pounding heartbeat, troubled breathing, or fainting); bradycardia (slow heartbeat); coronary thrombosis; and syncope

(fainting) 1; central nervous system (CNS) effects, including confusion and paresthesias (tingling, burning, or prickly sensations) 1; hypertension 1; hypotension (unusual tiredness or weakness) 1; pseudo-allergic reaction (skin rash or hives; stuffy nose; swelling of face or skin; swelling of the tongue; wheezing, tightness in chest or troubled breathing) 1

Those indicating need for medical attention only if they continue or are bothersome

Incidence less frequent

Changes in taste 1; dizziness; drowsiness 1; headache 1; nausea and vomiting 1; pain or bleeding at injection site 1; unusual warmth and flushing of skin; urinary retention (difficult urination); urinary urgency (frequent urination) 1

Patient Consultation

In providing consultation, consider emphasizing the following selected information (>> = major clinical significance):
Description of use

Action in the body: Injection into vein or artery; visualization of radiopacity in heart, blood vessels, and urinary tract possible with x-rays

Before having this test

>> Conditions affecting use, especially:

Sensitivity to iodine or other iodinated contrast media
Breast-feeding¾Temporary discontinuation of breast-feeding recommended
Use in the elderly¾Possible exacerbation of dehydration
Other medical problems, especially dehydration and pheochromocytoma
Preparation for this test

Adequate intake of fluids to prevent dehydration

Special preparatory instructions may be given; patient should inquire in advance

Precautions after having this test

Possible interference with future thyroid tests

Side/adverse effects

Signs of possible side effects, especially cardiac problems, CNS effects, and pseudo-allergic reaction that may occur immediately or within minutes of administration 1

General Dosing Information

Manufacturer's package insert or other appropriate literature should be consulted for specific techniques and procedures for the administration of contrast media.
Sensitivity test doses are not usually recommended since severe or fatal reactions to contrast media are not predictable from a patient's history or a sensitivity test. On some occasions, severe or fatal reactions have occurred with a test dose or with a full dose in patients who did not react to the test dose. 1

Pretreatment with corticosteroids and/or antihistamines may minimize the incidence and severity of reactions in patients with a history of severe reactions to contrast media or with other high-risk conditions (e.g., asthma or history of allergies, positive allergy history to skin allergens or penicillins, dehydration, history of seizures, pheochromocytoma).
Adequate hydration is recommended for all patients before and after the examination. Intravenous or oral intake of fluids may continue up to time of administration of iopromide. 1

During and for at least 30 to 60 minutes after intravascular injection of iopromide, the patient should be observed for possible severe reactions; competent personnel and emergency facilities should be available during this period. 1

Nonionic contrast media, such as iopromide, inhibit blood coagulation in vitro less than ionic contrast media. Blood cell aggregation has been reported when blood remains in contact with syringes containing nonionic contrast media. Thus, thromboembolic events causing myocardial infarction and stroke, reported during angiographic procedures, may have resulted from aggregation of blood that had come in contact with the contrast agent outside the body. Risk factors for blood cell aggregation should be minimized by performing the procedure in the shortest time possible, using plastic rather than glass syringes, and flushing catheters with heparinized saline solutions. 1

Parenteral Dosage Forms

IOPROMIDE INJECTION

Usual adult dose

Arteriography, cerebral 1¾
Intra-arterial, as a solution containing the equivalent of 300 mg of iodine per mL, into the following vessels: Carotid arteries, 3 to 12 mL.
Vertebral arteries, 4 to 12 mL.
Aortic arch, 20 to 50 mL for simultaneous four-vessel study.
Arteriography, coronary or
Ventriculography, left 1¾
Intra-arterial, as a solution containing the equivalent of 370 mg of iodine per mL, into the following vessels: Left coronary, range, 3 to 14 mL.
Right coronary, range, 3 to 14 mL.
Left ventricle, range, 30 to 60 mL.
Aortography or
Angiography, visceral¾
Intra-arterial, as a solution containing the equivalent of 370 mg of iodine per mL, into the aorta and major visceral arterial branches. The volume and rate used should be proportional to the blood flow through the vessels of interest, and related to the vascular and pathological characteristics of the specific vessels being studied. 1

Arteriography, peripheral 1¾
Intra-arterial, as a solution containing the equivalent of 300 mg of iodine per mL, into the following vessels: Subclavian or femoral artery, range, 5 to 40 mL.
Aortic bifurcation for distal runoff, range, 25 to 50 mL.
Angiography, intra-arterial, by digital subtraction 1¾
Intra-arterial, as a solution containing the equivalent of 150 mg of iodine per mL, injected at a rate approximately equal to the flow rate of the blood vessel, into the following vessels: Carotid arteries, 6 to 10 mL.
Vertebral arteries, 4 to 8 mL.
Aorta, 20 to 50 mL.
Major branches of the abdominal aorta, 2 to 20 mL.
Urography, excretory¾
Intravenous, a volume of the solution containing the equivalent of 300 mg of iodine per mL, which gives a dose of approximately 300 mg of iodine per kg of body weight. 1

Venography, peripheral¾
Intravenous, the minimum volume, of a solution containing the equivalent of 240 mg of iodine per mL, necessary to visualize satisfactorily the peripheral veins under examination. 1

Computed tomography (CT) of the brain¾
Intravenous, 50 to 200 mL of a solution containing the equivalent of 300 mg of iodine per mL. 1

CT of the body¾
Intravenous, 50 to 200 mL by bolus injection, or 100 to 200 mL by infusion of a solution containing the equivalent of 300 mg of iodine per mL. 1

Usual adult prescribing limits 1

Arteriography, cerebral¾Up to 150 mL.
Arteriography, coronary or
Ventriculography, left or
Aortography or
Angiography, visceral¾Up to 225 mL.
Arteriography, peripheral or
Angiography, intra-arterial, by digital subtraction or
Venography, peripheral¾Up to 250 mL.
Urography, excretory¾Up to 100 mL.
CT of the brain or
CT of the body¾Up to 200 mL.

Usual pediatric dose

Safety and efficacy have not been established. 1

Usual geriatric dose

See Usual adult dose.

Strength(s) usually available

U.S.¾311.7 mg of iopromide with 150 mg of iodine per mL (Rx)[Ultravist 150] 1

498.72 mg of iopromide with 240 mg of iodine per mL (Rx)[Ultravist 240] 1

623.4 mg of iopromide with 300 mg of iodine per mL (Rx)[Ultravist 300] 1

768.86 mg of iopromide with 370 mg of iodine per mL (Rx)[Ultravist 370] 1

Note: All formulations above contain 2.42 mg of tromethamine as a buffer and 0.1 mg of edetate calcium disodium as a stabilizer. 1

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