

NEW ZEALAND DATASHEET

Cefuroxime Injection

Cefuroxime Sodium Ph Eur, powder for injection, 250 mg, 750 mg and 1.5 g (as cefuroxime)

Presentation

Cefuroxime Injection is a white to yellowish powder aseptically filled into glass vials. The product conforms to Cefuroxime Injection BP and Cefuroxime for Injection USP.

Cefuroxime Injection 250 mg contains in a 15 ml vial, sterile cefuroxime sodium equivalent to cefuroxime 250 mg.

Cefuroxime Injection 750 mg contains in a 15 ml vial, sterile cefuroxime sodium equivalent to cefuroxime 750 mg.

Cefuroxime Injection 1.5 g contains in a 30 ml vial, sterile cefuroxime sodium equivalent to cefuroxime 1.5 g.

Uses

Actions

Cefuroxime is a well characterised and effective antibacterial agent which has bactericidal activity against a wide range of common pathogens, including beta-lactamase producing strains. Cefuroxime has good stability to bacterial beta-lactamase, and consequently is active against many ampicillin-resistant or amoxicillin-resistant strains.

Pharmacotherapeutic group

J01DC02 – Second generation cephalosporins, cefuroxime.

Antibiotic class

Semi-synthetic second generation cephalosporin for intramuscular or intravenous administration.

Antibiotic nature and mode of action

The bactericidal action of cefuroxime results from inhibition of cell wall synthesis by binding to essential target proteins. *In vitro* the activities of cefuroxime and aminoglycoside antibiotics in combination have been shown to be at least additive with occasional evidence of synergy.

Susceptibility data

Cefuroxime is usually active against the following organisms *in vitro*:

Aerobes Gram-negative

Escherichia coli; *Klebsiella* spp.; *Proteus mirabilis*; *Providencia* spp.; *Proteus rettgeri*; *Haemophilus influenzae* (including ampicillin-resistant strains); *Haemophilus parainfluenzae* (including ampicillin-resistant strains); *Moraxella (Branhamella) catarrhalis*; *Neisseria gonorrhoeae* (including penicillinase and non-penicillinase producing strains); *Neisseria meningitidis*; *Salmonellae* spp.

Aerobes Gram-positive

Staphylococcus aureus and *Staphylococcus epidermidis* (including penicillinase producing strains but excluding methicillin resistant strains); *Streptococcus pyogenes* (and other beta-haemolytic streptococci); *Streptococcus pneumoniae*; Streptococcus Group B (*Streptococcus agalactiae*); *Streptococcus mitis* (viridans group); *Bordetella pertussis*.

Anaerobes

Gram-positive and Gram-negative cocci (including *Peptococcus* and *Peptostreptococcus* species); Gram-positive bacilli (including most *Clostridium* species) and Gram-negative bacilli (including *Bacteroides* and *Fusobacterium* species); *Propionibacterium* spp.

Other organisms

Borrelia burgdorferi.

Resistance

The following organisms are not susceptible to cefuroxime: *Clostridium difficile*; *Pseudomonas* spp.; *Campylobacter* spp.; *Acinetobacter calcoaceticus*; *Listeria monocytogenes*; Methicillin resistant strains of *Staphylococcus aureus*; Methicillin resistant strains of *Staphylococcus epidermidis*; *Legionella* spp.

Some strains of the following genera are not susceptible to cefuroxime: *Enterococcus* (*Streptococcus*) *faecalis*; *Morganella morganii*; *Proteus vulgaris*; *Enterobacter* spp.; *Citrobacter* spp.; *Serratia* spp.; *Bacteroides fragilis*.

Pharmacokinetics

Absorption

Peak levels of cefuroxime are achieved within 30 to 45 minutes after intramuscular administration. Serum levels of cefuroxime are reduced by dialysis.

Distribution

Concentrations of cefuroxime in excess of the minimum inhibitory levels for common pathogens can be achieved in bone, synovial fluid and aqueous humour. Cefuroxime passes the blood-brain barrier when the meninges are inflamed. Protein binding has been variously stated as 33 to 50% depending on the methodology used.

Biotransformation

Cefuroxime is not metabolised and is excreted by glomerular filtration and tubular secretion. There is an almost complete recovery (85 to 90 %) of unchanged cefuroxime in urine within 24 hours of administration. The major part is excreted in the first six hours.

Elimination

The serum half-life after either intramuscular or intravenous injection is approximately 70 minutes. In the first weeks of life the serum half-life of cefuroxime can be 3 to 5 times that in the adult. Concurrent administration of probenecid prolongs the excretion of the antibiotic and produces an elevated peak serum level.

Indications

Cefuroxime is a bactericidal cephalosporin antibiotic which is resistant to most beta-lactamases and is active against a wide range of Gram-positive and Gram-negative organisms. It is indicated for the treatment of infections before the infecting organism has been identified or when caused by sensitive bacteria.

Indications include: respiratory tract infections for example, acute and chronic bronchitis, infected bronchiectasis, bacterial pneumonia, lung abscess and post-operative chest infections; ear, nose and throat infections for example, sinusitis, tonsillitis, pharyngitis and otitis media; urinary tract infections for example, acute and chronic pyelonephritis, cystitis and asymptomatic bacteriuria; soft-tissue infections for example, cellulitis, erysipelas and wound infections; bone and joint infections for example, osteomyelitis and septic arthritis; obstetric and gynaecological infections, pelvic inflammatory diseases; gonorrhoea particularly when penicillin is unsuitable; other infections including septicaemia, meningitis and peritonitis.

Prophylaxis against infection in abdominal, pelvic, orthopaedic, cardiac, pulmonary, oesophageal and vascular surgery where there is increased risk from infection. Usually cefuroxime will be effective alone, but when appropriate it may be used in combination with an aminoglycoside antibiotic, or in conjunction with metronidazole (orally or by suppository or injection), especially for prophylaxis in colonic or gynaecological surgery (refer to [Instructions for use/handling](#)).

Cefuroxime is also available as the axetil ester for oral administration. This permits the use of sequential therapy with the same antibiotic, when a change from parenteral to oral therapy is clinically indicated. Where appropriate cefuroxime is effective when used prior to oral therapy with cefuroxime axetil in the treatment of pneumonia and acute exacerbations of chronic bronchitis.

Dosage and administration

Dosage - general recommendations

Adults

Many infections respond to 750 mg three times daily by intramuscular or intravenous injection. For more severe infections the dose should be increased to 1.5 g given intravenously three times daily. The frequency of administration may be increased to 6-hourly if necessary, giving total daily doses of 3 to 6 g. Where clinically indicated, some infections respond to 750 mg or 1.5 g twice daily (intramuscularly or intravenously) followed by oral therapy with cefuroxime axetil.

Infants and children

30 to 100 mg/kg/day given as 3 or 4 divided doses. A dose of 60 mg/kg/day is appropriate for most infections.

Neonates

30 to 100 mg/kg/day given as 2 or 3 divided doses (refer to [Pharmacokinetics](#)).

Gonorrhoea

1.5 g in a single dose (as two 750 mg injections given intramuscularly in different sites, e.g. each buttock).

Meningitis

Cefuroxime is suitable for sole therapy of bacterial meningitis due to sensitive strains. For adults, give 3 g intravenously every eight hours. For infants and children, give 150 to 250 mg/kg/day intravenously in 3 or 4 divided doses. For neonates, the dosage should be 100 mg/kg/day intravenously.

Perioperative prophylaxis

The usual dose is cefuroxime 1.5 g given intravenously with induction of anaesthesia for abdominal, pelvic and orthopaedic operations. This may be supplemented with two 750 mg doses given intramuscularly eight and sixteen hours later. In cardiac, pulmonary, oesophageal and vascular operations, the usual dose is 1.5 g given intravenously with induction of anaesthesia, continuing with 750 mg given intramuscularly three times daily for a further 24 to 48 hours. In total joint replacement, 1.5 g cefuroxime powder may be mixed dry with each pack of methyl methacrylate cement polymer before adding the liquid monomer.

Sequential therapy

Cefuroxime is also available as the axetil ester for oral administration. This permits parenteral therapy with cefuroxime to be followed by oral therapy in situations where a change from parenteral to oral is clinically indicated. Duration of both parenteral and oral therapy is determined by the severity of the infection and the clinical status of the patient.

Pneumonia

Cefuroxime Injection 1.5 g twice or three times daily given intramuscularly or intravenously for 48 to 72 hours, followed by oral cefuroxime axetil 500 mg twice daily for 7 to 10 days.

Acute exacerbations of chronic bronchitis

Cefuroxime Injection 750 mg twice or three times daily given intramuscularly or intravenously for 48 to 72 hours, followed by oral cefuroxime axetil 500 mg twice daily for 5 to 10 days.

Impaired renal function

Cefuroxime is excreted by the kidneys. Therefore, as with all such antibiotics, in patients with markedly impaired renal function it is recommended that the dosage of cefuroxime should be reduced to compensate for its slower excretion. It is not necessary to reduce the standard dose of 750 mg to 1.5 g three times daily until the creatinine clearance falls to 20 ml/min or below. In adults with marked impairment (creatinine clearance 10 to 20 ml/min), 750 mg twice daily is recommended and with severe impairment (creatinine clearance less than 10 ml/min), 750 mg once daily is adequate. For patients on haemodialysis a further 750 mg dose should be given intravenously or intramuscularly at the end of each dialysis. In addition to parenteral use, cefuroxime can be incorporated into the peritoneal dialysis fluid (usually 250 mg for every 2 litres of dialysis fluid). For patients in renal failure on continuous arteriovenous haemodialysis or high-flux haemofiltration in intensive therapy units, a suitable dosage is 750 mg twice daily. For low-flux haemofiltration, follow the dosage recommended under Impaired renal function.

Administration

Cefuroxime Injection is intended for intravenous or intramuscular administration. Appropriate amounts of a suitable diluent are added to the vial contents to prepare an off-white suspension for intramuscular use or a yellow solution for intravenous administration. Variations in the intensity of this colour do not indicate any change in either the efficacy or safety of the product.

Contraindications

Hypersensitivity to cephalosporin antibiotics.

Warnings and precautions

Warnings

Cefuroxime should not ordinarily be given to those allergic to cephalosporins or to penicillins, especially where an allergic or urticarial reaction has occurred.

As with other antibiotics, use of cefuroxime may result in the overgrowth of *Candida*. Prolonged use may also result in the overgrowth of other non-susceptible organisms (e.g. enterococci and *Clostridium difficile*), which may require interruption of treatment.

As with other therapeutic regimens used in the treatment of meningitis, mild-to-moderate hearing loss has been reported in a few paediatric patients treated with cefuroxime sodium. Persistence of positive CSF cultures of *Haemophilus influenzae* at 18 to 36 hours has also been noted with cefuroxime sodium injection, as well as with other antibiotic therapies; however, the clinical relevance of this is unknown.

Precautions

Cephalosporin antibiotics at high dosage should be given with caution to patients receiving concurrent treatment with potent diuretics such as furosemide or aminoglycosides, as renal impairment has been reported with these combinations. Renal function should be monitored in these patients, the elderly, and those with pre-existing renal impairment (refer to Dosage and administration).

With a sequential therapy regime the timing of change to oral therapy is determined by the severity of the infection, clinical status of the patient and susceptibility of the pathogens involved. If there is no clinical improvement within 72 hours, then the parenteral course of treatment must be continued. Please refer to the relevant prescribing information for cefuroxime axetil before initiating sequential

therapy.

Pregnancy and lactation

Use in pregnancy

There is no experimental evidence of embryopathic or teratogenic effects attributable to cefuroxime, but, as with all medicines, it should be administered with caution during the early months of pregnancy.

Use in lactation

Cefuroxime is excreted in human milk, and consequently caution should be exercised when Cefuroxime Injection is administered to a nursing mother.

Effects on ability to drive and use machines

This medicine is presumed to be safe or unlikely to produce an effect.

Adverse effects

Adverse drug reactions are very rare (<1 in 10,000) and are generally mild and transient in nature. The frequency categories assigned to the adverse reactions below are estimates, as for most reactions suitable data for calculating incidence are not available. In addition the incidence of adverse reactions associated with cefuroxime sodium may vary according to the indication.

Data from clinical trials were used to determine the frequency of very common to rare undesirable effects. The frequencies assigned to all other undesirable effects (i.e., those occurring at <1 in 1000) were mainly determined using post-marketing data, and refer to a reporting rate rather than a true frequency. The following convention has been used for the classification of frequency: very common (1 in 10 or more); common (between 1 in 100 and 1 in 10); uncommon (between 1 in 1000 and 1 in 100); rare (between 1 in 10,000 and 1 in 1000); very rare (<1 in 10,000).

Infections and infestations

Rare

Candida overgrowth.

Blood and lymphatic system disorders

Common

Neutropenia, eosinophilia.

Uncommon

Leukopenia, decreased haemoglobin concentration, positive Coomb's test.

Rare

Thrombocytopenia.

Very rare

Haemolytic anaemia.

Cephalosporins as a class tend to be absorbed onto the surface of red cell membranes and react with antibodies directed against the drug to produce a positive Coomb's Test (which can interfere with cross matching of blood) and very rarely haemolytic anaemia.

Immune system disorders

Uncommon

Hypersensitivity reactions including skin rash, urticaria and pruritus.

Rare

Hypersensitivity reactions including drug fever

Very rare

Hypersensitivity reactions including interstitial nephritis, anaphylaxis, cutaneous vasculitis (q.v. Skin and subcutaneous tissue disorders and Renal and urinary disorders).

Vascular disorders

Common

Thrombophlebitis may follow intravenous injection.

Gastrointestinal disorders

Uncommon

Gastrointestinal disturbance.

Very rare

Pseudomembranous colitis.

Hepatobiliary disorders

Common

Transient rise in liver enzymes.

Uncommon

Transient rise in bilirubin. Transient rises in serum liver enzymes or bilirubin occur, particularly in patients with pre-existing liver disease, but there is no evidence of harm to the liver.

Skin and subcutaneous tissue disorders

Very rare

Erythema multiforme, toxic epidermal necrolysis and Stevens Johnson Syndrome (q.v. Immune system disorders).

Renal and urinary disorders

Very rare

Elevations in serum creatinine, elevations in blood urea nitrogen and decreased creatinine clearance (q.v. Immune system disorders and Warnings and precautions).

General disorders and administration site conditions

Rare

Transient pain at injection site. Pain at the intramuscular injection site is more likely at higher doses. However it is unlikely to be a cause for discontinuation of treatment.

Interactions

In common with other antibiotics, cefuroxime may affect the gut flora, leading to lower oestrogen reabsorption and reduced efficacy of combined oral contraceptives.

Cefuroxime does not interfere in enzyme-based tests for glycosuria. Slight interference with copper reduction methods (Benedict's solution, Fehling's solution or tableted reagents containing copper (II) sulphate) may be observed. However, this should not lead to false - positive results, as may be experienced with some other cephalosporins. It is recommended that either the glucose oxidase or hexokinase methods are used to determine blood/plasma glucose levels in patients receiving cefuroxime.

This antibiotic does not interfere in the alkaline picrate assay for creatinine.

Overdosage

Signs and symptoms

Overdosage of cephalosporins can cause cerebral irritation leading to convulsions.

Management

Serum levels of cefuroxime can be reduced by haemodialysis or peritoneal dialysis.

Pharmaceutical precautions

Instructions for use/handling

Intramuscular injection

Add 1 ml Water for Injections to Cefuroxime Injection 250 mg or 3 ml Water for Injections to Cefuroxime Injection 750 mg. Shake gently to produce an opaque suspension.

Intravenous injection

Dissolve Cefuroxime Injection in Water for Injections using at least 2 ml for 250 mg, at least 6 ml for 750 mg, or 15 ml for 1.5 g.

Intravenous infusion

Dissolve Cefuroxime Injection 1.5 g in Water for Injections 15 ml. Add the reconstituted solution to 50 or 100 ml of a compatible infusion fluid selected from the list below. These solutions may be given directly into the vein or introduced into the tubing of the giving set if the patient is receiving parenteral fluids.

Compatible diluents

Cefuroxime Injection 1.5 g reconstituted with 15 ml Water for Injections may be mixed with metronidazole infusion 500 mg/100 ml with mutual retention of activity for up to 24 hours when stored below 25°C.

Cefuroxime Injection 1.5 g is compatible with azlocillin 1g in 15 ml or 5 g in 50 ml for up to 24 hours at 4°C or 6 hours below 25°C.

Cefuroxime sodium solution 5 mg/ml in 5% w/v or 10% w/v xylitol injection may be stored for up to 24 hours at 25°C.

Cefuroxime Injection is compatible with aqueous solutions containing up to 1% lidocaine hydrochloride.

Cefuroxime Injection is compatible with the more commonly used intravenous infusion fluids. It will retain potency for up to 24 hours at room temperature in: Sodium Chloride Injection BP 0.9% w/v; 5% Dextrose Injection BP; 0.18% w/v Sodium Chloride plus 4% Dextrose Injection BP; 5% Dextrose and 0.9% Sodium Chloride Injection; 5% Dextrose and 0.45% Sodium Chloride Injection; 5% Dextrose and 0.225% Sodium Chloride Injection; 10% Dextrose Injection; 10% Invert Sugar in Water for Injection; Ringer's Injection USP; Lactated Ringer's Injection USP; M/6 Sodium Lactate Injection; Compound Sodium Lactate Injection BP (Hartmann's Solution).

The stability of cefuroxime sodium in Sodium Chloride Injection BP 0.9% w/v and in 5% Dextrose Injection is not affected by the presence of hydrocortisone sodium phosphate.

Cefuroxime Injection has also been found compatible for 24 hours at room temperature when admixed in intravenous infusion with: Heparin (10 and 50 units/ml) in 0.9% Sodium Chloride Injection; Potassium Chloride (10 and 40 mEq/l) in 0.9% Sodium Chloride Injection.

Incompatibilities

Cefuroxime Injection should not be mixed in the syringe with aminoglycoside antibiotics.

The pH of 2.74% w/v Sodium Bicarbonate Injection BP considerably affects the colour of the solution and therefore this solution is not recommended for the dilution of Cefuroxime Injection. However, if required, for patients receiving Sodium Bicarbonate Injection by infusion, Cefuroxime Injection may be introduced into the tube of the giving set.

Special precautions for storage

Store the unopened medicine at or below 25°C. Protect from light and moisture. Store the reconstituted medicine between 2 to 8°C and use within 24 hours. Refrigerate, do not freeze. Some increase in the colour of prepared solutions and suspensions of Cefuroxime Injection may occur on storage.

Medicine classification

Prescription Medicine.

Package quantities

Single vial packs. Not all pack sizes and/or strengths may be currently marketed.

Further information

Chemical properties

Each 750 mg vial contains 42 mg sodium (1.8 mEq).

Displacement volumes

250 mg vial

Cefuroxime Injection 250 mg is packaged in a 15 ml vial. Reconstitution with 1 ml diluent results in a final volume of approximately 1.3 ml. Reconstitution with 5 ml diluent results in a final volume of approximately 5.2 ml.

750 mg vial

Cefuroxime Injection 750 mg is packaged in a 15 ml vial. Reconstitution with 3 ml diluent results in a final volume of approximately 3.7 ml. Reconstitution with 6 ml diluent results in a final volume of

approximately 6.8 ml. Reconstitution with 10 ml diluent results in a final volume of approximately 10.6 ml.

1.5 g vial

Cefuroxime Injection 1.5 g is packaged in a 30 ml vial. Reconstitution with 15 ml diluent results in a final volume of approximately 16.5 ml. Reconstitution with 20 ml diluent results in a final volume of approximately 21.5 ml.

List of excipients

Nil.

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