CEFMINOX

Endocrine & metabolic: Changes in LDH, increased gamma-glutamyl transferase, nutrition disorder (vitamin B complex deficiency), vitamin K deficiency

Gastrointestinal: Diarrhea (<5%), anorexia, nausea, severe colitis, stomatitis, vomiting

Genitourinary: Hematuria, oliguria, proteinuria

Hematologic & oncologic: Eosinophilia (<5%), granulocytopenia (<5%), decreased hematocrit, decreased hemoglobin, decreased red blood cells, increased leukocyte alkaline phosphatase, lymphopenia, prolonged prothrombin time, thrombocytopenia

Hepatic: Increased serum alkaline phosphatase (<5%), increased serum ALT (<5%), increased serum AST (<5%), hepatic insufficiency, increased serum bilirubin, jaundice

Infection: Candidiasis

Renal: Increased blood urea nitrogen, increased serum creatinine

Miscellaneous: Fever

Drug Interactions

Metabolism/Transport Effects None known.

Avoid Concomitant Use None known.

Avoid concomitant use of Cefminox with any of the following: Alcohol (Ethyl); BCG (Intravesical); Cholera Vaccine

Increased Effect/Toxicity

Cefminox may increase the levels/effects of: Alcohol (Ethyl); Aminoglycosides; Vitamin K Antagonists

The levels/effects of Cefminox may be increased by: Probenecid

Decreased Effect

Cefminox decreases the levels/effects of BCG (Intravesical); BCG Vaccine (Immunization); Cholera Vaccine; Lactobacillus and Estriol; Sodium Picosulfate; Typloid Vaccine

Precautions/Preparation

Administration: IV injection; Reconstitute 1 g in 20 mL of water for injection, dextrose/glucose solution, or electrolyte solution

IV Infusion: Reconstitute 1 g in 100 to 500 mL of dextrose/glucose or electrolyte solution

Storage/Stability Store at room temperature; reconstituted solution stable for 12 hours at room temperature or 24 hours in refrigerator

Mechanism of Action Inhibits bacterial cell wall synthesis by binding to one or more of the penicillin-binding proteins (PBPs) which in turn inhibits the final transpeptidation step of peptidoglycan synthesis in bacterial cell walls, thus inhibiting cell wall biosynthesis. Bacteria eventually lyse due to ongoing activity of cell wall autolytic enzymes (autolysins and murein hydrolases) while cell eventually lyse due to ongoing activity of cell wall autolytic enzymes (autolysins and murein hydrolases) while cell wall synthesis is arrested.

Pharmacokinetics/Kinetics

Protein binding: 61%

Metabolism: No active metabolites have been identified

Half-life elimination: Normal renal function: <2 hours; impaired with renal impairment

Excretion: Normal renal function: Urine (90%)

Dosing

Adult & Geriatric Susceptible infections: IV: Usual dosage: 1 g every 12 hours; may administer up to 1.5 g every 6 hours or 2 g every 8 hours for septicaemia or refractory/severe infections

Pediatric Susceptible infections: Infants, Children, and Adolescents: IV: Usual dosage: 20 mg/kg every 6 to 8 hours (maximum: 1.5 g every 6 hours or 2 g every 8 hours)

Renal Impairment There are no specific dosage adjustments provided in the manufacturer's labeling; however, dosage reduction or prolonged dosing interval are recommended in severe renal impairment.

Hepatic Impairment There are no dosage adjustments provided in the manufacturer's labeling.

Administration IV: May administer as slow injection or as continuous infusion over 1 to 2 hours

Monitoring Parameters Renal function; prothrombin time/INR in select patients (nutritional-deficient, prolonged treatment, renal or hepatic disease, elderly). Observe for signs and symptoms of anaphylaxis.

Product Availability (US) Not available in US

Dosage Forms: International Excellent information presented; availability varies (limited, particularly for generics); consult specific product labeling.

Note: Availability of specific dosage forms may vary by country/region.

Solution Reconstituted: Injection, as sodium [strength expressed as base]: 1 g

Cefminox Sodium Hydrate see Cefminox on page 447

Cefoperazone

Brand Names: International Acela (CZ); Bicifar (MY); Bicifazone (BR); Cefazone (ID); Cefibid (TW); Cefal (IN); Cefobactam (KR); Cefobid (AE, AT, CN, CZ, EG, HK, HR, HU, ID, JO, KR, MY, OM, SG, SK, TH, UK, VN); Cefotam (KR); Cefoperazin (JP); Cefopid (ID); Cefoperazone (TH); Ceforan (NL); Cepfer (MR); Cephe- atam (KR); Ceropid (ID); Cezoro (ID); Cezzone (TW); Cizon (IN); CPZ (TW); Dardum (IT, PK); Defocel (VN); Febririn (BR); Flucil (IN); Logfaxo (ID); Magnamycin (IN); Medocel (CN, MY, RO, TR, VN); Medocelofae (JO); Medofetos (UA); Over (IN); Perasal (KR); Peratam (KR); Shlexin (CN); Stabilon (ID); Syntecol (TR); Tsejobe (UA); Xiran (CN); Yazon (ID)

Index Terms Cefoperazone Sodium Pharmacologic Category Antibiotic, Cephalosporin (Third generation)

Use Note: Not approved in the US and/or Canada

SUSCEPTIBLE INFECTIONS: Treatment of susceptible bacterial infections including respiratory tract, peritonitis, intra-abdominal, skin and skin structure, urinary tract, gynecologic and septicemia.

Pregnancy Considerations Adverse events were not observed in animal reproduction studies. Cefoperazone crosses the placenta.

Breastfeeding Considerations Cefoperazone is present in breast milk. The manufacturer recommends that it can be exercised when administering cefoperazone to breastfeeding women.

Contraindications Hypersensitivity to cefoperazone, other cephalosporins, or any component of the formulation

Warnings/Precautions

Use caution with patients with history of allergy to cephalosporins, other beta-lactam antibiotics, or penicillin. Use with caution in patients with a history of renal, hepatic, or hematologic impairment and/or biliary obstruction, half-life may be prolonged. Monitor serial serum concentrations with use of higher doses. Use with caution in patients with renal impairment. Monitor serum concentrations with use of higher doses; adjust dose if accumulation occurs. Potentially significant interactions may exist, requiring dose or frequency adjustment, additional monitoring, and/or selection of alternative therapy. Consult drug interaction database for more detailed information.

Flushing, sweating, headache, and palpitations may occur with cepofazone and concomitant alcohol consumption (disulfiram-like reactions); avoid alcohol beverages or products during therapy and for at least 72 hours after therapy completion.

ADVERSE REACTIONS

1% to 10%

Dermatologic: Allergic skin reaction (2%)

Gastrointestinal: Diarrhea (3%), loose stools (3%)

Hematologic & oncologic: Eosinophilia (10%), decreased hematocrit (5%), decreased hemoglobin (5%), neutropenia (2%)

Hepatic: Increased liver enzymes (5% to 10%)

Immunologic: Abnormal Coombs test (2%)

Renal: Increased blood urea nitrogen (6%), increased serum creatinine (2%)

Frequency not defined: Gastrointestinal: Pseudomembranous colitis (<1%), postmarketing, and/or case reports: Anaphylaxis, drug fever, hemorrhage, hepatic insufficiency, hypoprotrombinemia, injection site phlebitis, jaundice, nausea, pain, vomiting, shock, Stevens-Johnson Syndrome, thrombocytopenia, toxic epidermal necrolysis, vomiting

Drug Interactions

Metabolism/Transport Effects None known.
Avoid Concomitant Use
Avoid use with Cefoperazone with any of the following: BCG (intravesical); Cholera Vaccine
Increased Effect/Toxicity
Cefoperazone may increase the levels/effects of: Alcohol (Ethyl); Aminoglycosides; Vitamin K Antagonists
The levels/effects of Cefoperazone may be increased by:

Decreased Effect
Cefoperazone may decrease the levels/effects of: BCG (intravesical); BCG Vaccine (immunization); Cholera Vaccine; Lactobacillus and Estriol; Sodium Picosulfate; Typhoid Vaccine
Preparation for Administration
IM, IV: Reconstitute powder with an appropriate compatible diluent (including D5W, NS, SWFI, bacteriostatic water; consult local product labeling); variation may occur due to route of administration or patient population being treated/medication interactions. More vigorous agitation or dilution vial may be necessary to solubilize the product with a concentration >333 mg/mL. Allow solution to settle to allow for visual inspection. Maximum solubility of cefoperazone is 475 mg/mL. Preparations containing benzyl alcohol should not be used in neonates.

IM: When using a diluent other than lactidine, reconstitute 1 g vial with 2.6 to 3.8 mL of appropriate diluent (including D5W, NS, SWFI, bacteriostatic water) to achieve final concentrations ranging from 333 to 250 mg/mL, respectively.
When concentrations to be administered are >250 mg/mL, a lactidine solution should be used. An approximate 0.5% lactidine solution should be prepared using SWFI combined with 2% lidocaine in the following two-step dilution process: 1 g: Reconstitute with 2 mL SWFI first, followed by 0.6 mL 2% lactidine; final concentration 333 mg/mL. 1 g: Reconstitut and follow with 1 mL 2% lactidine; final concentration 250 mg/mL.

IV:
Initial: Reconstitute with 2.8 to 5 mL (preferred) of appropriate diluent (including D5W, D10W, NS) per 1 g of product.
Further dilution: Withdraw entire contents of vial for further dilution in an appropriate compatible diluent (including D5W, D10W, LR, NS). Final concentration should be between 2 and 50 mg/mL. Continuous infusions final concentrations should be between 2 and 25 mg/mL.
Pharmacokinetics
Storage/Stability
Intact vial: Store <25°C (77°F), protect from light.
Stability of reconstituted solutions:
2 mg/mL: Reconstituted in LR: Stable for 24 hours at room temperature of 15°C to 25°C (59°F to 77°F) or for 5 days when refrigerated at 2°C to 8°C (36°F to 46°F) Reconstituted in D5NS or D5I-NS: Stable for 3 weeks when refrigerated at 2°C to 10°C (-4°C to 14°F) to 2.0 to 50 mg/mL: Reconstituted in D5W, D5LR, D5NS, D5I-NS, D10W, Normosol M and D5W, Normosol R: Stable for 24 hours at room temperature of 15°C to 25°C (59°F to 77°F) Reconstituted in D5W, D5NS, D5I-NS, Normosol M and D5W, Normosol R: Stable for 5 days when refrigerated at 2°C to 8°C (36°F to 46°F) to 2 to 300 mg/mL: Reconstituted in NS: Stable for 24 hours at room temperature of 15°C to 25°C (59°F to 77°F) or for 5 days when refrigerated at 2°C to 8°C (36°F to 46°F) to 50 mg/mL: Reconstituted in D5W: Stable for 3 weeks when refrigerated at -20°C to -10°C (-4°F to 14°F) 300 mg/mL: Reconstituted in a bacteriostatic water for injection, 0.5% lactidine, SWFI: Stable for 24 hours at room temperature of 15°C to 25°C (59°F to 77°F) or for 5 days when refrigerated at 2°C to 8°C (36°F to 46°F)
Reconstituted in NS or SWFI: Stable for 5 weeks when frozen at -20°C to -10°C (-4°F to 14°F) Mechanism of Action
Inhibits bacterial cell wall synthesis, leading to the penetration of β-lactam-binding proteins (PBPs) which in turn inhibits peptidoglycan synthesis in bacterial cell walls, thus inhibiting cell wall biosynthesis.

Pharmacodynamics/Toxicology
Penetration: 92% to 93% (concentration dependent) Half-life elimination: Adults: <2 hours; Low birth-weight neonates: 6 to 10 hours
Excretion: Bile (primarily), urine (20% to 30%)
Dosing
Adult
Susceptible infections: IM, IV:
Usual dose: 1 to 2 g every 12 hours.
Severe infections/infecions caused by less sensitive organisms: 6 to 12 g daily in 2 to 4 divided doses (1.6 to 4 g/dose)
Geriatric Refer to adult doing; use caution and initiate therapy on the low end of the dosage range.
Renal Impairment No dosage adjustment necessary with use of usual doses. If higher doses are administered, it is recommended to monitor serum concentrations periodically; decrease dose with drug accumulation. Note: If infection involves concurrent renal and hepatic impairment, maximum dose should not exceed 1 to 2 g/day unless serum levels are being monitored.
Hemodialysis: Administer dose after dialysis.
Hepatic Impairment Maximum dose should not exceed 4 g/day. If higher doses are administered, monitor serum concentrations; decrease dose with drug accumulation. In patients with concurrent hepatic and severe renal impairment, maximum dose should not exceed 1 to 2 g/day unless serum levels are being monitored.

Adverse Effects
Central Nervous System:
Headache, dizziness, malaise, seizures (rare).
Respiratory System:
Mucous membrane disorders, hypoxia, asthma, bronchospasm, urticaria, rash, anaphylaxis.
Gastrointestinal:
Abdominal pain, diarrhea, vomiting, colitis, ileus, pseudomembranous colitis, nasopharyngitis.
Genitourinary:
Nephritis, pyelonephritis, prostatitis.
Metabolic:
Hyperglycemia, hypokalemia, hypomagnesemia, fluid retention.
Cutaneous:
Erythema multiforme, erythema nodosum, toxic epidermal necrolysis, Stevens-Johnson syndrome.
Miscellaneous:
Fever, pyrexia, chills.

Interactions
Cefoperazone may increase the levels/effects of: Alcohol, Cephalosporin Cefoperazone, P. mirabilis species,
Serratia marcescens, Klebsiella Bacteroides fragilis species,
Claforan in D5W [DSC]; Claforan Enterococcus species (including Pseudomonas, and species, and anaerobic cocci (including Proteus vulgaris), Refer to adult doing; use caution and initiate treatment of CNS infections (eg, meningitis, ventriculitis), resulting in the penetration of β-lactam-binding proteins (PBPs) which in turn inhibits peptidoglycan synthesis in bacterial cell walls, thus inhibiting cell wall biosynthesis.

Cefotaxime
Brand Names: US Clcafaron in D5W [DSC]; Clcafaron [DSC]
Brand Names: Canada Cefotaxime Sodium For Injection; Clcafaron
Index Terms Cefotaxime Sodium Pharmacologic Category Antibiotic, Cephalosporin (Third Generation)
Use
Bacteremia/Septicemia: Treatment of bacterial/septi- cemia caused by Escherichia coli, Klebsiella species, and Serratia marcescens, Staphylococcus aureus and Streptococcus species (including Streplococcus pneu- moniae).
Bone and Joint Infections: Treatment of bone or joint infections caused by S. aureus (penicillinase and non- penicillinase producing strains), Streptococcus species (including Streplococcus pyogenes), Pseudomonas species (including Pseudomonas aeruginosa), and Proteus mirabilis.
CNS Infections: Treatment of CNS infections (eg, meningitis, ventriculitis) caused by Neisseria meningitidis, Haemophilus influenzae, S. pneumoniae, Klebsiella pneumoniae, and E. coli.
Genitourinary Infections: Treatment of genitourinary infections, including urinary tract infections (UTIs) caused by Enterococcus species, Staphylococcus epider- midis, S. aureus (penicillinase and nonpenicillinase producing cultures), Citrobacter species, Enterobacter species, E. coli, Klebsiella species, P. mirabilis, Proteus vulgaris, Providencia stuartii, Morganella moragani, Providencia retgerii, S. marcescens, and Pseudomonas species (including P. aeruginosa). Also, uncomplicated gonor- rhea (cervical/urethral and rectal) caused by Neisseria gonorrhoeae, including penicillinase-producing strains.
Note: CDC STD guidelines do not recommend cefotax- ime as a treatment option for uncomplicated gonorrhea. Cefixime is the preferred cephalosporin (CDC [Work- owski 2015]).
Gynecologic Infections: Treatment of gynecologic infec- tions; may be used as an alternative option for uncomplicated endometritis, and pelvic cellulitis, caused by S. epidermidis, Streptococcus species, Enterococcus species, Enterobacter species, Klebsiella species, E. coli, P. mirabilis, Bacillus species (including Bacillus cereus, Bacillus fragilis, Clostridium species, and anaerobic cocci (including Pepsitostreptococcus and Peptococcus species) and Fusobacterium species (including Fusobacterium nucleatum).