

Summary of Product Characteristics for Pharmaceutical Products

1. NAME OF THE MEDICINAL PRODUCT

Cef-OD Suspension 100mg/5ml

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each 5ml of reconstituted suspension contains:

Cefixime (as Cefixime trihydrate) 100 mg

For the full list of excipients, see section 6.1

3. PHARMACEUTICAL FORM:

White to yellow powder for suspension

4. CLINICAL PARTICULARS:

4.1 Therapeutic Indications:

Cefixime Suspension is an orally active cephalosporin antibiotic which has marked in vitro bactericidal activity against a wide variety of Gram-positive and Gram-negative organisms.

It is indicated for the treatment of the following acute infections when caused by susceptible micro-organisms:

Upper Respiratory Tract Infections (URTI): e.g. otitis media; and other URTI where the causative organism is known or suspected to be resistant to other commonly used antibiotics, or where treatment failure may carry significant risk.

Lower Respiratory Tract Infection: e.g. bronchitis.

Urinary Tract Infections: e.g. cystitis, cystourethritis, uncomplicated pyelonephritis. Clinical efficacy has been demonstrated in infections caused by commonly occurring pathogens including *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella species*, *Haemophilus influenzae* (beta-lactamase positive and negative), *Branhamella catarrhalis* (beta-lactamase positive and negative) and *Enterobacter species*. Cefixime Suspension is highly stable in the presence of betalactamase enzymes.

Most strains of enterococci (*Streptococcus faecalis*, group D Streptococci) and Staphylococci (including coagulase positive and negative strains and meticillin-resistant strains) are resistant to Cefixime Suspension. In addition, most strains of *Pseudomonas*, *Bacteriodes fragalis*, *Listeria monocytogenes* and *Clostridia* are resistant to Cefixime Suspension.

4.2 Posology and method of administration:

Route of Administration: Oral

Absorption of Cefixime is not significantly modified by the presence of food. The usual course of treatment is 7 days. This may be continued for up to 14 days if required.

Posology

Adults and Children over 10 Years or weighing more than 50 kg: The recommended adult dosage is 200-400 mg daily according to the severity of infection, given either as a single dose or in two divided doses.

The Elderly: Elderly patients may be given the same dose as recommended for adults. Renal function should be assessed and dosage should be adjusted in severe renal Impairment

Children (Use Paediatric Oral Suspension): The recommended dosage for children is 8mg/kg/ are suggested:

6 months up to 1 year:	3.75 ml daily
Children 1-4 years	5 ml daily
Children 5-10 years	10ml daily

Children weighing more than 50 kg or older than 10 years should be treated with the recommended adult dose (200 - 400 mg daily depending on the severity of infection). The safety and efficacy of cefixime has not been established in children less than 6 Months.

Dosage in Renal Impairment: Cefixime may be administered in the presence of impaired renal function. Normal dose and schedule may be given in patients with creatinine clearances of 20 ml/min or greater. In patients whose creatinine clearance is less than 20 ml/min, it is recommended that a dose of 200 mg once daily should not be exceeded. The dose and regimen for patients who are maintained on chronic ambulatory peritoneal dialysis or hemodialysis should follow the same recommendation as that for patients with creatinine clearances of less than 20 ml/min.

4.3 Contraindications:

Patients with known hypersensitivity to cephalosporin antibiotics or any other components of the product.

4.4 Special warning and precautions**for use: Encephalopathy**

Beta-lactams, including cefixime, predispose the patient to encephalopathy risk (which may include convulsions, confusion, impairment of consciousness, movement disorders), particularly in case of overdose or renal impairment. Severe cutaneous adverse reactions (SCARS) including toxic epidermal necrolysis (TEN), Stevens-Johnson syndrome (SJS) drug rash with eosinophilia and systemic symptoms (DRESS), and acute generalised exanthematous pustulosis (AGEP) have been reported in association with cefixime. Patients should be informed about the signs and symptoms of serious skin manifestations and monitored closely. Treatment should be discontinued at the first appearance of skin rash, mucosal lesions, or any other sign of skin hypersensitivity. Cefixime dry syrup should be given with caution to patients who have shown hypersensitivity to other drugs.

Hypersensitivity to penicillins

As with other cephalosporins, cefixime should be given with caution to patients with a history of hypersensitivity to penicillin, as there is some evidence of partial cross-allergenicity between the penicillins and cephalosporins. Patients have had severe reactions (including anaphylaxis) to both classes of drugs. If an allergic effect occurs with Cefixime dry syrup the drug should be discontinued and the patient treated with appropriate agents if necessary.

Renal failure acute

As with other cephalosporins, cefixime may cause acute renal failure including tubulointerstitial nephritis as an underlying pathological condition. When acute renal failure occurs, cefixime should be discontinued and appropriate therapy and/or measures should be taken.

Renal impairment

Cefixime should be administered with caution in patients with markedly impaired renal function.

Paediatric use

Safety of cefixime in premature or newborn infant has not been established.

Antibiotic-associated colitis

Treatment with broad spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is a primary cause of antibiotic-associated diarrhoea. Pseudomembranous colitis is associated with the use of broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, lincosamides and cephalosporins); it is therefore important to consider its diagnosis in patients who develop diarrhoea in association with the use of antibiotics. Symptoms of pseudomembranous colitis may occur during or after antibiotic treatment.

Management of pseudomembranous colitis should include sigmoidoscopy, appropriate bacteriologic studies, fluids, electrolytes and protein supplementation. If the colitis does not improve after the drug has been discontinued, or if the symptoms are severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be excluded.

4.5 Interaction with other medicinal products, other forms of**interactions: Anticoagulants**

In common with other cephalosporins, increases in prothrombin times have been noted in a few patients. Care should therefore be taken in patients receiving anticoagulation therapy.

Cefixime should be administered with caution to patients receiving coumarin-type anticoagulants, e.g. warfarin potassium. Since cefixime may enhance effects of the anticoagulants, prolonged prothrombin time with or without bleeding may occur.

Other forms of interaction

A false positive reaction for glucose in the urine may occur with Benedict's or Fehling's solutions or with copper sulphate test, but not with tests based on enzymatic glucose oxidase reactions.

A false positive direct Coombs test has been reported during treatment with cephalosporin antibiotics; therefore, it should be recognised that a positive Coombs test may be due to the drug.

4.6 Fertility, pregnancy and lactation:

Reproduction studies have been performed in mice and rats at doses up to 400 times the human dose and have revealed no evidence of impaired fertility or harm to the foetus due to cefixime. In the rabbit, at doses up to 4 times the human dose, there was no evidence of a teratogenic effect; there was a high incidence of abortion and maternal death which is an expected consequence of the known sensitivity of rabbits to antibiotic-induced changes in the population of the microflora of the intestine. There are no adequate and well-controlled studies in pregnant women. Cefixime should therefore not be used in pregnancy or in nursing mothers unless considered essential by the physician.

4.7 Effects on ability to drive and operate machine:

Cefixime has no or negligible influence on the ability to drive and use machines.

4.8 Undesirable effects:

Cefixime Suspension is generally well tolerated. The majority of adverse reactions observed in clinical trials were mild and self-limiting in nature. The following adverse reaction (Preferred term# or equivalent) will be considered listed:

Blood and lymphatic system disorders:	Eosinophilia Hypereosinophilia Agranulocytosis Leucopenia Neutropenia Granulocytopenia Haemolytic anaemia Thrombocytopenia Thrombocytosis
Gastrointestinal:	Abdominal pain Diarrhoea* Dyspepsia Nausea Vomiting Flatulence
Hepatobiliary disorders:	Jaundice
Infections and infestations:	Pseudomembranous colitis
Investigations:	Aspartate aminotransferase increased Alanine aminotransferase increased Blood bilirubin increased Blood urea increased Blood creatinine increased

Nervous system disorders:	Dizziness
	Headache
Respiratory, thoracic and mediastinal disorders:	Dyspnoea
Renal and urinary disorders:	Renal failure acute including tubulointerstitial nephritis as an underlying pathological condition
Immune System disorders, administrative site conditions, skin and subcutaneous tissue disorders:	Anaphylactic reaction Serum sickness-like reaction Drug rash with eosinophilia and systemic symptoms (DRESS) Pruritus Rash Drug Fever Arthralgia Erythema multiforme Stevens-Johnson syndrome Toxic epidermal necrolysis Angio-oedema Urticaria Pyrexia Face oedema Genital pruritus Vaginitis

Diarrhea has been more commonly associated with higher doses. Some cases of moderate to severe diarrhea have been reported; this has occasionally warranted cessation of therapy. Cefixime should be discontinued if marked diarrhea occurs.

Reporting of suspected adverse reactions: Healthcare professionals are requested to report any suspected adverse reactions to report any suspected adverse reactions to the National Regulatory Authority.

4.9 Overdose:

There is no experience with overdoses with Cefixime. Adverse reactions seen at dose levels up to 2 g Cefixime in normal subjects did not differ from the profile seen in patients treated at the recommended doses. Cefixime is not removed from the circulation in significant quantities by dialysis.

No specific antidote exists. General supportive measures are recommended.

5 PHARMACOLOGICAL PROPERTIES:

5.1 Pharmacodynamic properties:

Cefixime is an oral third generation cephalosporin which has marked in vitro bactericidal activity against a wide variety of Gram-positive and Gram-negative organisms. Clinical efficacy has been demonstrated in infections caused by commonly occurring pathogens including Streptococcus

pneumoniae, *Streptococcus pyogenes*, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella* species, *Haemophilus influenzae* (beta-lactamase positive and negative), *Branhamella catarrhalis* (beta-lactamase positive and negative) and *Enterobacter* species. It is highly stable in the presence of beta-lactamase enzymes. Most strains of enterococci (*Streptococcus faecalis*, group D *Streptococci*) and *Staphylococci* (including coagulase positive and negative strains and methicillin-resistant strains) are resistant to cefixime. In addition, most strains of *Pseudomonas*, *Bacteroides fragilis*, *Listeria monocytogenes* and *Clostridia* are resistant to cefixime.

Pharmacotherapeutic group: Third-generation cephalosporins, ATC code: J01DD08

Mechanism of action

Cefixime is an antibacterial agent of the cephalosporin class. Like other cephalosporins, cefixime exerts antibacterial activity by binding to and inhibiting the action of penicillin-binding proteins involved in the synthesis of bacterial cell walls. This leads to bacterial cell lysis and cell death.

Pharmacokinetic/pharmacodynamic relationship

The time that the plasma concentration of cefixime exceeds the MIC of the infecting organism has been shown to best correlate with efficacy in pharmacokinetic/pharmacodynamic studies. **Mechanisms of resistance**

Bacterial resistance to cefixime may be due to one or more of the following mechanisms:

- Hydrolysis by extended-spectrum beta-lactamases and / or by chromosomally-encoded (AmpC) enzymes that may be induced or de-repressed in certain aerobic gram-negative bacterial species
 - Reduced affinity of penicillin-binding proteins
 - Reduced permeability of the outer membrane of certain gram-negative organisms restricting access to penicillin-binding proteins
 - Drug efflux pumps
- More than one of these mechanisms of resistance may co-exist in a single bacterial cell. Depending on the mechanism(s) present, bacteria may express cross-resistance to several or all other beta-lactams and/or antibacterial drugs of other classes.

5.2 Pharmacokinetic properties:

Absorption

The absolute oral bioavailability of cefixime is in the range of 40-50%. Absorption is not significantly modified by the presence of food. Cefixime may therefore be given without regard to meals. Following oral administration of cefixime to healthy volunteers, peak serum concentrations are generally attained in 3 to 4 hours. After a single oral dose of 50, 100 and 200 mg mean peak serum concentrations were 1.02, 1.46 and 2.63 mg/L respectively in 12 healthy volunteers of Western origin and 0.69, 1.13 and 1.95 mg/L respectively in 12 healthy Japanese volunteers. Over a dose range of 200 to 2000 mg, there is a less than proportional increase in AUC and C_{max} with increasing dose. Between 200 and 400 mg there was an almost dose-proportional increase in AUC and C_{max} (1.7-fold increase with 2-fold increase in dose). **Distribution**

Serum protein binding is well characterised for human and animal sera; cefixime is almost exclusively bound to the albumin fraction, the mean free fraction being approximately 30%. Protein binding of cefixime is only

concentration dependent in human serum at very high concentrations which are not seen following clinical dosing. Cefixime is distributed to target organs/tissues such as tonsils, maxillary sinus mucosal tissue, lung tissue and gallbladder tissue. From in vitro studies, serum or urine concentrations of 1 mcg/ml or greater were considered to be adequate for most common pathogens against which cefixime is active. Typically, the peak serum levels following the recommended adult or paediatric doses are between 1.5 and 3 mcg/ml. Little or no accumulation of cefixime occurs following multiple dosing.

Biotransformation and elimination

No biologically active metabolites of cefixime were identified in plasma or urine following oral administration to healthy volunteers. Around 20% of a 200 mg dose of cefixime is recovered unchanged over 24 hours in the urine of healthy volunteers. The elimination half-life is 2-4 hours.

Special populations

Elderly

The pharmacokinetics of cefixime in healthy elderly (age > 64 years) and young volunteers (18-35) was compared when administering 400 mg doses once daily for 5 days. Mean C_{max} and AUC values were slightly greater in the elderly. Elderly patients may be given the same dose as the general population (see section 4.2).

Paediatric Population

Following a single oral dose of 1.5, 3.0 and 6.0 mg/kg of cefixime in Japanese paediatric patients, maximum serum concentrations at around 3 to 4 hours were 1.14, 2.01 and 3.97 mg/L, respectively.

Renal Impairment:

Studies in patients with various degrees of renal dysfunction administered single 400 mg oral doses of cefixime indicated that elimination half-life, oral clearance (CL/F), renal clearance and AUC were altered in patients with severe renal dysfunction (creatinine clearance < 20 mL/min) and in those on hemodialysis or continuous ambulatory peritoneal dialysis (CAPD), as compared with healthy subjects.

5.3 Pre-clinical safety data:

There are no findings from chronic toxicity investigations suggesting that any side effects unknown to date could occur in humans. Furthermore, in vivo and in vitro studies did not yield any indication of a potential to cause mutagenicity. Long-term studies on carcinogenicity have not been conducted. Reproduction studies have been performed in mice and rats at doses up to 400 times the human dose and have revealed no evidence of impaired fertility or harm to the fetus due to cefixime. In the rabbit, at doses up to 4 times the human dose, there was no evidence of a teratogenic effect; there was a high incidence of abortion and maternal death, which is an expected consequence of the known sensitivity of rabbits to antibiotic-induced changes in the population of the microflora of the intestine. Transfer of ¹⁴C-labelled cefixime from lactating rats to their nursing offspring through breast milk was quantitatively small (approximately 1.5% of the mothers' body content of cefixime in the pup). Placental transfer of cefixime was small in pregnant rats dosed with labelled cefixime.

6. PHARMACEUTICAL PARTICULARS

6.1. List of excipients:

- Aspartame
- Pineapple Flavor
- Sodium Citrate Dihydrate
- Sodium Benzoate
- Xanthan Gum
- Aerosil 200
- CMC Sodium
- Sucrose

6.2. Incompatibilities:

Not applicable.

6.3. Shelf-life:

2 years

6.4. Special precautions for storage:

- Keep away from heat, moisture, light and children;
- Stored in room conditions below 30°C

6.5. Nature and contents of container:

30ml in HDPE bottle and PLASTIC spoon long 5ml with imported sheet and water for reconstitution, in bleach board unit carton along with leaflet.

6.6 Special precautions for disposal:

Not applicable.

7. Marketing authorization holder

CCL Pharmaceuticals (Pvt.) Ltd.
62-Industrial Estate, Kot Lakhpat,
Lahore-54770, Pakistan.

8. Marketing authorization number

H2018/CTD4148/268ER

9. Date of first registration / renewal of the registration

2026 May 11

10. Date of revision of the text:

10-12-2025