

## Summary of Product Characteristics

**Abacus Tablet**

**Abacus Suspension**



# Abacus<sup>®</sup>

(Cefpodoxime Proxetil)

## 1. NAME OF THE PRODUCT

**Abacus<sup>®</sup>** (Cefpodoxime Proxetil) 100mg Tablets

**Abacus<sup>®</sup>** (Cefpodoxime Proxetil) 200mg Tablets

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

### **Abacus<sup>®</sup> 100mg Tablets**

Each film coated tablet contains:

Cefpodoxime Proxetil equivalent to

Cefpodoxime.....100mg

### **Abacus<sup>®</sup> 200mg Tablets**

Each film coated tablet contains:

Cefpodoxime Proxetil equivalent to

Cefpodoxime.....200mg

## 3. PHARMACEUTICAL FORM

Film-coated tablet

### **Appearance:**

**Abacus<sup>®</sup> 100mg Tablets:** Light purple to dark purple colored oblong film coated tablet, engraved H on one side while other side having bisection line.

**Abacus<sup>®</sup> 200mg Tablets:** Light peach to peach colored oblong film coated tablet, engraved H on one side while other side having bisection line.

## 4. CLINICAL PARTICULARS

### 4.1. THERAPEUTIC INDICATIONS:

**Abacus<sup>®</sup>** is indicated for the treatment of the following infections when caused by susceptible organisms.

- Sinusitis
- Tonsillitis and pharyngitis

In the above indications, **Abacus<sup>®</sup>** should be reserved for recurrent or chronic infections, or for infections where the causative organism is known or suspected to be resistant to commonly used antibiotics or in case the commonly used antibiotic cannot be used for any reason.

- Acute bronchitis
- Exacerbation of chronic bronchitis
- Bacterial pneumonia



**Abacus<sup>®</sup>** is not the preferred antibiotic for the treatment of Staphylococcal pneumonia and should not be used in the treatment of atypical pneumonia caused by organisms such as Legionella, Mycoplasma and Chlamydia. Consideration should be given to official guidance on the appropriate use of antibacterial agents.

#### 4.2. POSOLOGY AND METHOD OF ADMINISTRATION:

##### Posology:

##### Adults and adolescents with normal renal function:

Sinusitis: 200mg twice daily.

Tonsillitis and pharyngitis: 100mg twice daily

Acute bronchitis, exacerbation of chronic bronchitis and bacterial pneumonia: 100-200mg twice daily, dependent on the severity of the infection.

**Elderly:** It is not necessary to modify the dose in elderly patients with normal renal function.

**Patients with renal impairment:** The dose of cefpodoxime does not require modification if creatinine clearance exceeds 40ml/min. Below this value, pharmacokinetic studies indicate an increase in plasma elimination half-life. Therefore, the dose should be adjusted appropriately.

CREATININE CLEARANCE (ML/MIN)	
39-10	Unit dose administered as a single dose every 24 hours.
<10	Unit dose administered as a single dose every 48 hours.
Haemodialysis patients	Unit dose administered after each dialysis session.

NOTE: The unit dose is either 100mg or 200mg, depending on the type of infection as stated above.

**Patients with hepatic impairment:** The dose does not require modification in cases of hepatic impairment.

**Duration:** The duration of therapy depends on the patient, the indication and the causative pathogen(s).

##### Method of administration:

For oral use only. The tablets should be taken with food for optimum absorption.

#### 4.3. CONTRAINDICATIONS:

- Hypersensitivity with the active substance, to any the cephalosporins or to any of the excipients.
- Previous immediate and/or severe hypersensitivity reaction to a penicillin or to any other type of beta-lactam drug.



#### 4.4. SPECIAL WARNINGS AND PRECAUTIONS FOR USE:

**Hypersensitivity reactions:** Before therapy with cefpodoxime is instituted, careful inquiry should be made to determine whether the patient has had any previous hypersensitivity reactions to cefpodoxime, cephalosporins, penicillins, or other beta-lactam drugs. Cefpodoxime is contraindicated in patients who have had a previous hypersensitivity reaction to any cephalosporin. It is also contraindicated in patients who have had a previous immediate and / or any severe hypersensitivity reaction to any penicillin or to any other beta-lactam drug. Cefpodoxime should be given with caution to patients who have had any other type of hypersensitivity reaction to a penicillin or any other beta-lactam drug. Hypersensitivity reactions (anaphylaxis) observed with beta-lactam antibiotics can be serious and occasionally fatal. The onset of any manifestation of hypersensitivity indicates that treatment should be stopped.

**Renal Insufficiency:** In cases of severe renal insufficiency, it may be necessary to reduce the dosage regimen dependent on the creatinine clearance.

**Gastrointestinal disease:** Cefpodoxime should always be used with caution in patients with a history of gastrointestinal disease, particularly colitis. Antibiotic associated diarrhoea, colitis and pseudomembranous colitis have been reported with the use of cefpodoxime. These diagnoses should be considered in any patient who develops diarrhoea during or shortly after treatment. Cefpodoxime should be discontinued if severe and/or bloody diarrhoea occurs during treatment and appropriate therapy instituted.

**Blood monitoring:** As with all beta-lactam antibiotics, neutropaenia and more rarely agranulocytosis may develop particularly during extended treatment. For cases of treatment lasting longer than 10 days, the blood count should be monitored and treatment discontinued if neutropaenia is found. Cephalosporins may be absorbed onto the surface of red cell membranes and react with antibodies directed against the drug. This can produce a positive Coomb's test and very rarely, haemolytic anaemia. Cross-reactivity may occur with penicillin for this reaction.

**Renal function:** Changes in renal function have been observed with cephalosporin antibiotics, particularly when given concurrently with potentially nephrotoxic drugs such as aminoglycosides and/or potent diuretics. In such cases, renal function should be monitored.

**Prolonged use:** As with other antibiotics, the prolonged use of cefpodoxime proxetil may result in the overgrowth of non-susceptible organisms. With oral antibiotics the normal colonic flora may be altered, allowing overgrowth by clostridia with consequent pseudomembranous colitis. Repeated evaluation of the patient is essential and if superinfection occurs during therapy, appropriate measures should be taken.

**Neurotoxicity:** Beta-Lactam antibiotics, including cefpodoxime, predispose patients to encephalopathy (which can include seizure, confusion,



consciousness disorders or abnormal movements), particularly if they have had an overdose or if they have impaired renal function.

This medicinal product contains less than 1mmol sodium (23mg) per tablet, that is to say essentially 'sodium-free'.

#### **4.5. INTERACTION WITH OTHER MEDICINAL PRODUCTS AND OTHER FORM OF INTERACTIONS:**

No clinically significant drug interactions have been reported during the course of clinical studies.

Histamine H<sub>2</sub>-antagonists and antacids reduce the bioavailability of cefpodoxime. Probenecid reduces the excretion of cephalosporins. Cephalosporins potentially enhance the anticoagulant effect of coumarins.

**Antacids and H<sub>2</sub> blockers:** Studies have shown that bioavailability is decreased by approximately 30% when cefpodoxime is administered with drugs which neutralize gastric pH or inhibit acid secretions. Therefore, such drugs as antacids of the mineral type and H<sub>2</sub> blockers such as ranitidine, which can cause an increase in gastric pH, should be taken 2 to 3 hours after cefpodoxime administration.

**Influence on laboratory diagnostic tests:** A false positive reaction for glucose in the urine may occur with Benedict's or Fehling's solution or with copper sulphate test tablets, but not with tests based on enzymatic glucose oxidase reactions.

#### **4.6. FERTILITY, PREGNANCY AND LACTATION:**

**Pregnancy:** For cefpodoxime proxetil no clinical data on exposed pregnancies are available. Caution should be exercised when prescribing to pregnant women. The safety of cefpodoxime proxetil in pregnancy has not been established. It should be administered with caution during the early months of pregnancy.

**Breast-feeding:** Cefpodoxime is excreted in human milk. Mothers should stop breast-feeding during treatment with cefpodoxime.

#### **4.7. EFFECTS ON ABILITY TO DRIVE AND USE MACHINES:**

Cefpodoxime proxetil has minor or moderate influence on the ability to drive and use machines. Dizziness has been reported during treatment with cefpodoxime and may affect patients' ability to drive or operate machinery.

#### **4.8. UNDESIRABLE EFFECTS:**

In this section undesirable effects are defined as follows: Very common ( $\geq 1/10$ ), Common ( $\geq 1/100$  to  $< 1/10$ ), Uncommon ( $\geq 1/1,000$  to  $< 1/100$ ), Rare ( $\geq 1/10,000$  to  $< 1/1,000$ ), Very rare ( $< 1/10,000$ ), Not known (cannot be estimated from the available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

**Infections and Infestations:**

**Not Known:** There can be multiplication of non-sensitive microorganisms.

**Blood and lymphatic system disorders:**

**Rare:** Haematological disorders, such as reduction in haemoglobin, thrombocytosis, thrombocytopaenia, leucopaenia and eosinophilia.

**Very rare:** Haemolytic anaemia.

**Immune system disorders:**

Hypersensitivity reactions of all degrees of severity have been observed.

**Uncommon:** Allergic reactions, such as mucocutaneous reactions, skin rashes, urticaria and pruritus.

**Very rare:** Dermal reactions with blistering (erythema multiforme, Stevens-Johnson syndrome, Lyell syndrome). The medication should be terminated if such symptoms occur. As with other cephalosporins, there have been very rare reports of anaphylactic reactions, bronchospasm, purpura and angioedema.

**Metabolism and nutrition disorders:**

**Common:** Loss of appetite.

**Nervous system disorders:**

**Uncommon:** Headaches, paraesthesiae, dizziness.

**Not known:** Neurotoxicity.

**Ear and labyrinth disorders:**

**Uncommon:** Tinnitus.

**Gastrointestinal disorders:**

**Common:** Gastric pressure, nausea, vomiting, abdominal pain, flatulence, diarrhoea.

**Rare:** Bloody diarrhoea can occur as a symptom of enterocolitis, The possibility of pseudomembranous enterocolitis should be considered if severe or persistent diarrhoea occurs during or after treatment.

**Renal and urinary disorders:**

**Very rare:** Slight increases in blood urea and creatinine.

**General disorders and administration site conditions:**

**Uncommon:** Asthenia or malaise.

**Hepatobiliary disorders:**

**Rare:** Transient moderate elevations of ASAT, ALAT and alkaline phosphatase and/or bilirubin. These laboratory abnormalities which may be explained by the infection, may rarely exceed twice the upper limit of the named range and elicit a pattern of liver injury, usually cholestatic and most often asymptomatic.

**Very rare:** Liver damage.

**4.9. OVERDOSE:**

In the event of overdose with cefpodoxime proxetil, supportive and symptomatic therapy is indicated. In cases of overdose, particularly in patients with renal insufficiency, encephalopathy may occur. The encephalopathy is usually reversible once cefpodoxime plasma levels have fallen.



## 5. PHARMACOLOGICAL PROPERTIES

### 5.1. PHARMACODYNAMIC PROPERTIES:

**Pharmacotherapeutic group:**  $\beta$ -lactam antibiotic, 3<sup>rd</sup> generation cephalosporines  
**ATC code:** J01DD13.

**Mechanism of action:** Like other beta-lactam drugs, cefpodoxime exerts antibacterial activity by binding to and inhibiting the action of certain bacterial cell wall synthetic enzymes, namely the penicillin binding proteins. This results in the interruption of cell wall (peptidoglycan) biosynthesis, which leads to bacterial cell lysis and death.

**Mechanisms of Resistance:** Bacterial resistance to cefpodoxime may be due to one or more of the following mechanisms:

- Hydrolysis by beta-lactamases. Cefpodoxime may be efficiently hydrolysed by certain of the extended-spectrum beta-lactamases (ESBLs) and by the chromosomally-encoded (AmpC) enzyme that may be induced or stably derepressed in certain aerobic gram-negative bacterial species
- Reduced affinity of penicillin-binding proteins for cefpodoxime
- Outer membrane impermeability, which restricts access of cefpodoxime to penicillin binding proteins in gram-negative organisms
- Drug efflux pumps

### 5.2. PHARMACOKINETICS PROPERTIES:

**Absorption:** When cefpodoxime proxetil is administered orally to fasting subjects as a tablet corresponding to 100mg of cefpodoxime, 51.1% is absorbed and absorption is increased by food intake.

**Distribution:** The volume of distribution is 32.3L and peak levels of cefpodoxime occur 2 to 3 hrs after dosing. The maximum plasma concentration is 1.2mg/l and 2.5mg/l after doses of 100mg and 200mg respectively. Following administration of 100mg and 200mg twice daily over 14.5 days, the plasma pharmacokinetic parameters of cefpodoxime remain unchanged. Serum protein binding of cefpodoxime, 40% principally to albumin. This binding is non saturable in type. Concentration of cefpodoxime in excess of the minimum inhibitory levels (MIC) for common pathogens can be achieved in lung parenchyma, bronchial mucosa, pleural fluid, tonsils, interstitial fluid and prostate tissue.

**Metabolism:** Cefpodoxime proxetil is taken up in the intestine and is hydrolysed to the active metabolite cefpodoxime.

**Elimination:** The main route of excretion is renal, 80% is excreted unchanged in the urine, with an elimination half-life of approx. 2.4 hours.

### 5.3. PRECLINICAL SAFETY DATA:

Adverse reactions not observed in clinical studies, but seen in animals at exposure levels similar to clinical exposure levels and with possible relevance to clinical use were as follows:



**Acute Toxicity:** The median lethal dose in mice and rats was above 8g/kg and 4g/kg bodyweight, respectively. In Fisher rats doses of 1g/kg body weight and higher influenced stool consistency and weight gain. Single doses of 800mg/kg body weight were non-toxic in dogs.

**Repeat-dose toxicity:** Chronic toxicity studies were carried out over 12 months in rats and 6 months in dogs. Maximum daily doses (1000mg/kg body weight orally in rats and 400mg/kg orally in dogs) were considerably higher than recommended therapeutic doses (3-8mg/kg body weight). No mortality was observed in rats receiving 250, 500 or 1000mg/kg for 12 months. Only at 1000 mg/kg, effects on the GI-tract, softened stools and dilatation of the caecum were observed. Intestinal side effects, which were more pronounced in Fisher rats, are due to the change in intestinal flora caused by the pronounced antibacterial effect of cefpodoxime. Daily administration of 0, 25, 100, and 400mg/kg body weight to dogs did not reveal mortality. Unchanged cefpodoxime was detected in faeces.

**Reproduction toxicity:** Embryotoxicity studies in rats and rabbits have not revealed any signs of teratogenic potential. Cefpodoxime had no adverse effects on fertility and peri-/postnatal toxicity studies in rats. Cefpodoxime or its metabolites cross the placenta and are excreted in breast milk in rats. No experience is available on the use of cefpodoxime during pregnancy and lactation in humans.

**Mutagenicity:** Extensive mutagenicity testing in different testing models was negative.

## 6. PHARMACEUTICAL PARTICULARS

### 6.1. LIST OF EXCIPIENTS:

#### **Abacus<sup>®</sup> 100mg Tablets:**

- Calcium CMC
- HPC
- Polyplasdone Type B
- Sodium Lauryl Sulphate
- Magnesium Stearate
- Silicon Dioxide Fumed
- Lactose Monohydrate
- Avicel PH
- Maize Starch
- Methocel
- Talcum Powder
- Polyethylene Glycol
- Poly Vinyl Pyrrolidone
- Titanium Dioxide
- Isopropyl Alcohol
- Amaranth Lake Color



**Abacus<sup>®</sup> 200mg Tablets:**

- Calcium CMC
- HPC
- Polyplasdone Type B
- Sodium Lauryl Sulphate
- Magnesium Stearate
- Silicon Dioxide Fumed
- Lactose Monohydrate
- Avicel PH
- Maize Starch
- Methocel
- Talcum Powder
- Polyethylene Glycol
- Poly Vinyl Pyrrolidone
- Titanium Dioxide
- Isopropyl Alcohol
- Sunset Yellow Lake Color

**6.2. INCOMPATIBILITIES:**

Not applicable.

**6.3. SHELF LIFE:**

See expiry on the pack.

**6.4. SPECIAL PRECAUTIONS FOR STORAGE:**

Do not store over 30°C, and protect from heat and moisture.  
Improper storage may deteriorate the medicine.  
Keep out of reach of children.

**6.5. NATURE AND CONTENTS OF CONTAINER:**

**Abacus<sup>®</sup> 100mg Tablets:** Alu/Alu blister, pack size is 10's.

**Abacus<sup>®</sup> 200mg Tablets:** Alu/Alu blister, pack size is 10's.

**6.6. SPECIAL PRECAUTIONS FOR DISPOSAL AND OTHER HANDLING:**

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

**6.7. DRUG PRODUCT SPECIFICATION:**


**Abacus<sup>®</sup> 100mg Tablets:** USP Specs.

**Abacus<sup>®</sup> 200mg Tablets:** USP Specs.



## 7. REGISTRATION / MARKETING AUTHORISATION HOLDER

Manufactured by:

 **ealthtek (Pvt.) Limited**  
Plot No. 14, Sector 19, Korangi  
Industrial Area Karachi - Pakistan



Associate of:

**SAMI Pharmaceuticals (Pvt.) Ltd.**  
Karachi-Pakistan  
www.samipharma.com

## 8. REGISTRATION / MARKETING AUTHORISATION NUMBER(S)

Abacus<sup>®</sup> 100mg Tablets: 047018

Abacus<sup>®</sup> 200mg Tablets: 047019

## 9. DATE OF FIRST AUTHORISATION / RENEWAL OF THE AUTHORISATION

Abacus<sup>®</sup> 100mg Tablets: 04<sup>th</sup> September, 2007

Abacus<sup>®</sup> 200mg Tablets: 04<sup>th</sup> September, 2007

## 10. DATE OF REVISION OF THE TEXT

**ابیکس<sup>®</sup> ٹیبلٹ**  
(سینفیوڈ وکسیم پروکسیٹل)

**ہدایات:**

خوراک ڈاکٹر کی ہدایت کے مطابق استعمال کریں۔  
صرف رجسٹرڈ ڈاکٹر کے نسخے کے مطابق فروخت کریں۔  
بچوں کی پہنچ سے دور رکھیں۔

دوا کو ۳۰ ڈگری سینٹی گریڈ سے زیادہ درجہ حرارت پر نہ رکھیں،  
گرمی اور نمی سے محفوظ رکھیں ورنہ دوا خراب ہو جائیگی۔

R.N-01/QC/12/2025\_SmPC



# Abacus<sup>®</sup>

(Cefpodoxime Proxetil)

## 1. NAME OF THE PRODUCT

**Abacus<sup>®</sup>** (Cefpodoxime Proxetil) 40mg/5ml Suspension

**Abacus<sup>®</sup>** (Cefpodoxime Proxetil) 100mg/5ml Suspension

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

### **Abacus<sup>®</sup> 40mg/5ml Suspension**

After reconstitution each 5ml suspension contains:

Cefpodoxime Proxetil equivalent to

Cefpodoxime.....40mg

### **Abacus<sup>®</sup> 100mg/5ml Suspension**

Each 5ml contains (reconstituted):

Cefpodoxime Proxetil equivalent to

Cefpodoxime.....100mg

## 3. PHARMACEUTICAL FORM

Powder for oral suspension

### **Appearance:**

**Abacus<sup>®</sup> 40mg/5ml Suspension:** Light purple to dark purple colored granular free flowing powder with white to pale yellow back having characteristic odor of blood orange.

**Abacus<sup>®</sup> 100mg/5ml Suspension:** Light orange to orange brown colored free flowing powder having no lumps & foreign particle with characteristic odor of blood orange.

## 4. CLINICAL PARTICULARS

### 4.1. THERAPEUTIC INDICATIONS:

**Abacus<sup>®</sup>** Suspension is indicated for the treatment of the following infections when caused by susceptible organisms.

- Acute otitis media
- Sinusitis
- Tonsillitis and pharyngitis

In the above indications, cefpodoxime should be reserved for recurrent or chronic infections, or for infections where the causative organism is known or suspected to be resistant to commonly used antibiotics or in case the commonly used antibiotic cannot be used for any reason.

- Acute bronchitis
- Bacterial pneumonia



**Abacus<sup>®</sup>** is not the preferred antibiotic for the treatment of staphylococcal pneumonia and should not be used in the treatment of atypical pneumonia caused by organisms such as Legionella, Mycoplasma and Chlamydia. Consideration should be given to official guidance on the appropriate use of antibacterial agents.

#### 4.2. POSOLOGY AND METHOD OF ADMINISTRATION:

##### Posology:

##### Paediatric population:

**Children (up to 11 years):** The recommended dose for children is 8mg/kg/day administered in two divided doses at 12-hour intervals.

##### Note that:

5ml of suspension contains the equivalent of 40mg cefpodoxime.

1ml of suspension contains the equivalent of 8mg cefpodoxime.

The following table provides a guide to prescribing:

Body weight in KG	Cefpodoxime dose in mg to be given twice daily	Cefpodoxime dose in ml of suspension to be given twice daily
5	20mg	2.5ml
10	40mg	5ml
15	60mg	7.5ml
20	80mg	10ml
25	100mg	12.5ml

Children who weigh at least 25kg may receive 12.5ml twice daily or may choose to receive a 100mg tablet twice daily. Cefpodoxime should not be used in infants less than 15 days old as there is no experience in this age group.

**Patients with renal impairment:** The dose of Cefpodoxime does not require modification if creatinine clearance exceeds 40ml.min<sup>-1</sup>/1.73m<sup>2</sup>.

Below this value, pharmacokinetic studies indicate an increase in plasma elimination half-life. Therefore, the dose should be adjusted appropriately as shown in the table below.

CREATININE CLEARANCE (ML/MIN)	
39 – 10	4mg/kg should be administered once every 24 hours.
< 10	4mg/kg should be administered once every 48 hours.
Haemodialysis Patients	4mg/kg should be administered after each dialysis session.



**Patients with hepatic impairment:** The dose does not require modification in cases of hepatic impairment.

**Duration:** The duration of therapy depends on the patient, the indication and the causative pathogen(s).

**Method of administration:**

The suspension is for oral administration only. Doses should be taken during meals for optimal absorption.

**4.3. CONTRAINDICATIONS:**

- Hypersensitivity to the active substance to any of the cephalosporins or to any of the suspension excipients.
- Previous immediate and/or severe hypersensitivity reaction to a penicillin or to any other type of beta-lactam drug.

**4.4. SPECIAL WARNINGS AND PRECAUTIONS FOR USE:**

**Hypersensitivity reactions:** Before therapy with cefpodoxime is instituted, careful inquiry should be made to determine whether the patient has had any previous hypersensitivity reactions to cefpodoxime, cephalosporins, penicillins, or other beta-lactam drugs. Cefpodoxime is contraindicated in patients who have had a previous hypersensitivity reaction to any cephalosporin. It is also contraindicated in patients who have had a previous immediate and /or any severe hypersensitivity reaction to any penicillin or to any other beta-lactam drug. Hypersensitivity reactions (anaphylaxis) observed with beta-lactam antibiotics can be serious and occasionally fatal. The onset of any manifestation of hypersensitivity indicates that treatment should be stopped.

**Renal Insufficiency:** In cases of severe renal insufficiency, it may be necessary to reduce the dosage regimen dependent on the creatinine clearance.

**Gastrointestinal disease:** Cefpodoxime should always be used with caution in patients with a history of gastrointestinal disease, particularly colitis. Antibiotic associated diarrhoea, colitis and pseudomembranous colitis have been reported with the use of cefpodoxime. These diagnoses should be considered in any patients who develops diarrhoea during or shortly after treatment. Cefpodoxime should be discontinued if severe and/or bloody diarrhoea occurs during treatment and appropriate therapy instituted.

**Blood monitoring:** As with all beta-lactam antibiotics, neutropaenia, and more rarely agranulocytosis may develop, particularly during extended treatment. For cases of treatment lasting longer than 10 days, the blood count should be monitored and treatment discontinued if neutropaenia is found. Cephalosporins may be absorbed onto the surface of red cell membranes and react with antibodies directed against the drug. This can produce a positive Coomb's test



and very rarely, haemolytic anaemia. Cross-reactivity may occur with penicillin for this reaction.

**Renal function:** Changes in renal function have been observed with cephalosporin antibiotics, particularly when given concurrently with potentially nephrotoxic drugs such as aminoglycosides and/or potent diuretics. In such cases, renal function should be monitored.

**Prolonged use:** As with other antibiotics, the prolonged use of cefpodoxime proxetil may result in the overgrowth of non-susceptible organisms. With oral antibiotics the normal colonic flora may be altered, allowing overgrowth by clostridia with consequent pseudomembranous colitis. Repeated evaluation of the patient is essential and if superinfection occurs during therapy, appropriate measures should be taken.

**Severe cutaneous adverse reactions (SCARs):** Severe cutaneous adverse reactions (SCARs) including Stevens-Johnson syndrome (SJS), toxic epidermal necrolysis (TEN), drug reaction with eosinophilia and systemic symptoms (DRESS), and acute generalized exanthematous pustulosis (AGEP), which can be life-threatening or fatal, have been reported with unknown frequency in association with cefpodoxime treatment. Patients should be advised of the signs and symptoms and monitored closely for skin reactions. If signs and symptoms suggestive of these reactions appear, cefpodoxime should be withdrawn immediately, and an alternative treatment considered.

**Paediatric population:** The product should not be used in infants less than 15 days old.

**Neurotoxicity:** Beta-lactam antibiotics, including cefpodoxime, predispose patients to encephalopathy (which can include seizure, confusion, consciousness disorders or abnormal movements), particularly if they have had an overdose or if they have impaired renal function.

This medicinal product contains less than 1mmol (23mg) sodium in each 5ml, that is to say essentially sodium free.

This medicinal product contains 3.016g sucrose in each 5ml. Patients with rare hereditary problems of fructose intolerance, glucose-galactose malabsorption or sucrase-isomaltase insufficiency should not take this medicinal product.

#### 4.5. INTERACTION WITH OTHER MEDICINAL PRODUCTS AND OTHER FORM OF INTERACTIONS:

No clinically significant drug interactions have been reported during the course. Histamine H<sub>2</sub>-antagonists and antacids reduce the bioavailability of cefpodoxime. Probenecid reduces the excretion of cephalosporins. Cephalosporins potentially enhance the anticoagulant effect of coumarins.

**Antacids and H<sub>2</sub> blockers:** Bioavailability is decreased by approximately 30% when cefpodoxime is administered with drugs which neutralize gastric pH or inhibit acid secretions. Therefore, such drugs as antacids of the mineral type



and H<sub>2</sub> blockers such as ranitidine, which can cause an increase in gastric pH, should be taken 2 to 3 hours after cefpodoxime administration.

**Influence on laboratory diagnostic tests:** A false positive reaction for glucose in the urine may occur with Benedict's or Fehling's solution or with copper sulphate test tablets, but not with tests based on enzymatic glucose oxidase reactions.

**Special INR imbalance issues:** Numerous cases of increased oral anticoagulant activity have been reported in patients receiving antibiotics. The severity of the infection or inflammation, age and general health status of the patient appear to be risk factors. Under these circumstances, it seems difficult to determine to what extent the infection itself or its treatment play a role in the INR imbalance. However, certain classes of antibiotics are more involved, particularly fluoroquinolones, macrolides, cyclines, cotrimoxazole and certain cephalosporins.

#### 4.6. FERTILITY, PREGNANCY AND LACTATION:

**Pregnancy:** The safety of cefpodoxime proxetil in pregnancy has not been established and, as with all drugs, it should be administered with caution during the early months of pregnancy.

**Breast-feeding:** Cefpodoxime is excreted in human milk. Mothers should stop breast-feeding during treatment with cefpodoxime.

#### 4.7. EFFECTS ON ABILITY TO DRIVE AND USE MACHINES:

Cefpodoxime proxetil has minor or moderate influence on the ability to drive and use machines. Dizziness has been reported during treatment with cefpodoxime and may affect patients' ability to drive or operate machinery.

#### 4.8. UNDESIRABLE EFFECTS:

In this section undesirable effects are defined as very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ), rare ( $\geq 1/10,000$  to  $< 1/1,000$ ), very rare ( $< 1/10,000$ ), not known (cannot be estimated from the available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

##### **Infections and Infestations:**

**Not known:** There can be multiplication of non-sensitive microorganisms

##### **Blood and lymphatic system disorders:**

**Rare:** Haematological disorders, such as reduction in haemoglobin, thrombocytosis, thrombocytopenia, leucopenia and eosinophilia.

**Very rare:** Haemolytic anaemia

##### **Immune system disorders:**

Hypersensitivity reactions of all degrees of severity have been observed

**Uncommon:** Allergic reactions, such as mucocutaneous reactions, skin rashes, urticaria and pruritus.



**Very rare:** Dermal reactions with blistering (erythema multiforme, Stevens-Johnson syndrome, Lyell syndrome). The medication should be terminated if such symptoms occur. As with other cephalosporins, there have been very rare reports of anaphylactic reactions, bronchospasm, purpura and angioedema.

**Metabolism and nutrition disorders:**

**Common:** Loss of appetite.

**Nervous system disorders:**

**Uncommon:** Headaches, paraesthesiae, dizziness.

**Not known:** Neurotoxicity.

**Ear and labyrinth disorders:**

**Uncommon:** Tinnitus

**Gastrointestinal disorders:**

**Common:** Gastric pressure, nausea, vomiting, abdominal pain, flatulence, diarrhoea.

**Rare:** Bloody diarrhoea can occur as a symptom of enterocolitis. The possibility of pseudomembranous enterocolitis should be considered if severe or persistent diarrhoea occurs during or after treatment

**Hepatobiliary disorders:**

**Rare:** Transient moderate elevations of ASAT, ALAT and alkaline phosphatase and/or bilirubin. These laboratory abnormalities which may be explained by the infection, may rarely exceed twice the upper limit of the named range and elicit a pattern of liver injury, usually cholestatic and most often asymptomatic.

**Very rare:** Liver damage

**Skin and subcutaneous tissue disorders:**

**Not known:** Acute generalized exanthematous pustulosis (AGEP), drug reaction with eosinophilia and systemic symptoms (DRESS).

**Renal and urinary disorders:**

**Very rare:** Slight increases in blood urea and creatinine

**General disorders and administration site conditions:**

**Uncommon:** Asthenia or malaise.

**4.9. OVERDOSE:**

In the event of overdose with cefpodoxime proxetil, supportive and symptomatic therapy is indicated. In cases of overdose, particularly in patients with renal insufficiency, encephalopathy may occur. The encephalopathy is usually reversible once cefpodoxime plasma levels have fallen.

**5. PHARMACOLOGICAL PROPERTIES:**

**5.1. PHARMACODYNAMIC PROPERTIES:**

**Pharmacotherapeutic group:**  $\beta$ -lactam antibiotic, 3<sup>rd</sup> generation cephalosporines.

**ATC code:** J01D D13.



Cefpodoxime proxetil is a semi-synthetic beta-lactam antibiotic, belonging to the class of 3rd generation oral cephalosporins. It is the prodrug of cefpodoxime. Orally-administered cefpodoxime proxetil is absorbed from the gastrointestinal tract and rapidly hydrolyzed by non-specific esterase into cefpodoxime, a bactericidal antibiotic.

**Mechanism of action:** Like other  $\beta$ -lactam drugs, cefpodoxime exerts antibacterial activity by binding to and inhibiting the action of certain bacterial cell wall synthetic enzymes, namely the penicillin binding proteins. This results in the interruption of cell wall (peptidoglycan) biosynthesis, which leads to bacterial cell lysis and death.

**Mechanisms of Resistance:** Bacterial resistance to cefpodoxime may be due to one or more of the following mechanisms:

- Hydrolysis by beta-lactamases. Cefpodoxime may be efficiently hydrolysed by certain of the extended-spectrum beta-lactamases (ESBLs) and by the chromosomally-encoded (AmpC) enzyme that may be induced or stably derepressed in certain aerobic gram-negative bacterial species
- Reduced affinity of penicillin-binding proteins for cefpodoxime
- Outer membrane impermeability, which restricts access of cefpodoxime to penicillin binding proteins in gram-negative organisms
- Drug efflux pumps

## 5.2. PHARMACOKINETICS PROPERTIES:

**Absorption:** Cefpodoxime proxetil is administered orally to fasting patients, 51.1% is absorbed and absorption is increased by food intake.

**Distribution:** The volume of distribution is 32.3L and peak levels of cefpodoxime occur 2 to 3 hrs after dosing. Serum protein binding of cefpodoxime, 40% principally to albumin. This binding is non saturable. Concentration of cefpodoxime in excess of the minimum inhibitory levels (MIC) for common pathogens can be achieved in lung parenchyma, bronchial mucosa, pleural fluid, tonsils, interstitial fluid and prostate tissue.

**Metabolism:** Cefpodoxime proxetil is taken up in the intestine and is hydrolysed to the active metabolite cefpodoxime.

**Elimination:** The main route of excretion is renal, 80% is excreted unchanged in the urine, with an elimination half-life of approx. 2.4 hours.

**Children:** The maximum plasma concentration occurs approximately 2-4 hours after dosing. A single 5mg/kg dose in 4-12 years olds produced a maximum concentration similar to that in adults given a 200mg dose. In patients below 2 years receiving repeated doses of 5mg/kg 12 hourly, the average plasma concentrations, 2hrs post dose, are between 2.7mg/l (1-6 months) and 2.0mg/l (7 months - 2 years). In patients between 1 month and 12 years receiving repeated doses of 5mg/kg 12 hourly, the residual plasma concentration at steady state are between 0.2-0.3mg/l (1 month - 2 years) and 0.1mg/l (2-12 years).



### 5.3. PRECLINICAL SAFETY DATA:

Adverse reactions not observed in clinical studies, but seen in animals at exposure levels similar to clinical exposure levels and with possible relevance to clinical use were as follows:

**Acute Toxicity:** The median lethal dose in mice and rats was above 8g/kg and 4 g/kg bodyweight, respectively. In Fisher rats doses of 1g/kg body weight and higher influenced stool consistency and weight gain. Single doses of 800mg/kg body weight were non-toxic in dogs.

**Repeat-dose toxicity:** Chronic toxicity studies were carried out over 12 months in rats and 6 months in dogs. Maximum daily doses (1000mg/kg body weight orally in rats and 400mg/kg orally in dogs) were considerably higher than recommended therapeutic doses (3-8mg/kg body weight). No mortality was observed in rats receiving 250, 500 or 1000mg/kg for 12 months. Only at 1000mg/kg, effects on the GI-tract, softened stools and dilatation of the caecum were observed. Intestinal side effects, which were more pronounced in Fisher rats, are due to the change in intestinal flora caused by the pronounced antibacterial effect of cefpodoxime. Daily administration of 0, 25, 100, and 400mg/kg body weight to dogs did not reveal mortality. Unchanged cefpodoxime was detected in faeces.

**Reproduction toxicity:** Embryotoxicity studies in rats and rabbits have not revealed any signs of teratogenic potential. Cefpodoxime had no adverse effects on fertility and peri-/postnatal toxicity studies in rats. Cefpodoxime or its metabolites cross the placenta and are excreted in breast milk in rats. No experience is available on the use of cefpodoxime during pregnancy and lactation in humans.

**Mutagenicity:** Extensive mutagenicity testing in different testing models was negative.

## 6. PHARMACEUTICAL PARTICULARS

### 6.1. LIST OF EXCIPIENTS:

#### **Abacus<sup>®</sup> 40mg/5ml Suspension:**

- Sucrose
- Metolose
- Xanthan Gum
- MCC & CMC
- Sodium Lauryl Sulphate/Texapon
- Simethicone LVA/Simethicone Antifoam
- Monoammonium Glycyrrhizinate/Megna Sweet
- Sucralose
- Blood Orange Flavour
- Amaranth Lake Color



**Abacus<sup>®</sup> 100mg/5ml Suspension:**

- Sucrose
- Metolose
- Xanthan Gum
- MCC & CMC
- Sodium Lauryl Sulphate/Texapon
- Simethicone LVA/Simethicone Antifoam
- Monoammonium Glycyrrhizinate/Megna Sweet
- Sucralose
- Blood Orange Flavour
- Sunset Yellow Lake Color

**6.2. INCOMPATIBILITIES:**

Not applicable

**6.3. SHELF LIFE:**

See expiry on the pack.

**6.4. SPECIAL PRECAUTIONS FOR STORAGE:**

Do not store over 30°C, and protect from heat and moisture.  
Improper storage may deteriorate the medicine.  
Keep out of reach of children.

**6.5. NATURE AND CONTENTS OF CONTAINER:**

**Abacus<sup>®</sup> 40mg/5ml Suspension:** Amber glass bottle with tamper-proof aluminium cap with conical plug, contains 5ml measuring spoon, bottle size 90ml for pack size 50ml respectively.

**Abacus<sup>®</sup> 100mg/5ml Suspension:** Amber glass bottle with tamper-proof aluminium cap with conical plug, contains 5ml measuring spoon, bottle size 90ml for pack size 50ml respectively.

**6.6. SPECIAL PRECAUTIONS FOR DISPOSAL AND OTHER HANDLING:**

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

**6.7. DRUG PRODUCT SPECIFICATION:**


**Abacus<sup>®</sup> 40mg/5ml Suspension:** USP Specs.

**Abacus<sup>®</sup> 100mg/5ml Suspension:** USP Specs.



## 7. REGISTRATION / MARKETING AUTHORISATION HOLDER

Manufactured by:

 **ealthtek (Pvt.) Limited**  
Plot No. 14, Sector 19, Korangi  
Industrial Area Karachi - Pakistan



Associate of:

**SAMI Pharmaceuticals (Pvt.) Ltd.**  
Karachi-Pakistan  
www.samipharma.com

## 8. REGISTRATION / MARKETING AUTHORISATION NUMBER(S)

Abacus<sup>®</sup> 40mg/5ml Suspension: 047007

Abacus<sup>®</sup> 100mg/5ml Suspension: 093010

## 9. DATE OF FIRST AUTHORISATION / RENEWAL OF THE AUTHORISATION

Abacus<sup>®</sup> 40mg/5ml Suspension: 4<sup>th</sup> September, 2007

Abacus<sup>®</sup> 100mg/5ml Suspension: 31<sup>st</sup> December, 2018

## 10. DATE OF REVISION OF THE TEXT

**ابیکس<sup>®</sup> سسپینشن**  
(سینفپوڈ و کسیم پروکسیٹیل)

ہدایات:

خوراک ڈاکٹر کی ہدایت کے مطابق استعمال کریں۔

صرف رجسٹرڈ ڈاکٹر کے نسخے کے مطابق فروخت کریں۔

بچوں کی پہنچ سے دور رکھیں۔

دوا کو ۳۰ ڈگری سینٹی گریڈ سے زیادہ درجہ حرارت پر نہ رکھیں،

گرمی اور نمی سے محفوظ رکھیں ورنہ دوا خراب ہو جائیگی۔

تیار شدہ سسپینشن کو ۲ سے ۸ ڈگری سینٹی گریڈ پر رکھیں

تا کہ دوا کی تاثیر برقرار رہے اور ۱۰ یوم کے اندر استعمال کر لیں۔

R.N-01/QC/12/2025\_SmPC