Package leaflet: Information for the user

Ceftazidime 500 mg Powder for solution for injection

Ceftazidime

Read all of this leaflet carefully before you start using this medicine because it contains important information for you.
- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor.
- If any of the side effects get serious, or if you notice any side effects not listed in this leaflet, please tell your doctor.

In this leaflet:

The name of your medicine is "Ceftazidime powder for solution for injection" (referred to as **Ceftazidime Injection** throughout this leaflet).

1. WHAT CEFTAZIDIME INJECTION IS AND WHAT IT IS USED FOR

Ceftazidime is an antibiotic used in adults and children (including newborn babies). It works by killing bacteria that cause infections. It belongs to a group of medicines called cephalosporins.

Ceftazidime is used to treat severe bacterial infections of:
- the lungs or chest
- the lungs and bronchi in patients suffering from cystic fibrosis
- the brain (meningitis)
- the ear
- the urinary tract
- the skin and soft tissues
- the abdomen and abdominal wall (peritonitis)
- the bones and joints.

Ceftazidime can also be used:
- to prevent infections during prostate surgery in men
- to treat patients with low white blood cell counts (neutropenia) who have a fever due to a bacterial infection.

2. WHAT YOU NEED TO KNOW BEFORE YOU ARE GIVEN CEFTAZIDIME INJECTION

You must not be given Ceftazidime Injection:
- **if you are allergic** (hypersensitive) to **ceftazidime** or the other ingredients of this medicine (see section 6).
- if you have had a **severe allergic reaction** to any **other antibiotic** (penicillins, monobactams and carbapenems) as you may also be allergic to Ceftazidime.

Tell your doctor before you start on Ceftazidime if you think that this applies to you. You must not be given Ceftazidime Injection.

Take special care with Ceftazidime Injection
You must look out for certain symptoms such as allergic reactions, nervous system disorders and gastrointestinal disorders such as diarrhoea while you are being given Ceftazidime. This will reduce the risk of possible problems. See '*Conditions you need to look out for*' in Section 4.

If you have had an allergic reaction to other antibiotics you may also be allergic to Ceftazidime.

If you need a blood or urine test
Ceftazidime can affect the results of urine tests for sugar and a blood test known as the 'Coombs test'. If you are having tests, **tell the person taking the sample** that you have been given Ceftazidime.

Taking other medicines
Tell your doctor if you are taking any other medicines, if you've started taking any recently or you start taking new ones. This includes medicines you can obtain without a prescription.

You shouldn't be given Ceftazidime without talking to your doctor if you are also taking:
• an antibiotic called chloramphenicol
• a type of antibiotic called aminoglycosides e.g. gentamicin, tobramycin
• water tablets called furosemide
Tell your doctor if this applies to you.

Pregnancy and breast-feeding
Tell your doctor before you are given Ceftazidime:
• If you are pregnant, think you might be pregnant or are planning to become pregnant
• If you are breastfeeding
Your doctor will consider the benefit of treating you with Ceftazidime against the risk to your baby.

Driving and using machines
Ceftazidime can cause side effects that affect your ability to drive, such as dizziness.
Don't drive or use machines unless you are sure you're not affected.

Important information about some of the ingredients of Ceftazidime Injection
Ceftazidime Injection 500 mg contains 26 mg sodium per vial;
You need to take this into account if you are on a controlled sodium diet.

3. HOW CEFTAZIDIME INJECTION IS GIVEN

Ceftazidime Injection is usually given by a doctor or nurse. It can be given as a **drip** (intravenous infusion) or as an **injection** directly into a vein or into a muscle.

Ceftazidime Injection is made up by the doctor, pharmacist or nurse using water for injections or a suitable infusion fluid.

The usual dose
The correct dose of Ceftazidime for you will be decided by your doctor and depends on: the severity and type of infection; whether you are on any other antibiotics; your weight and age; how well your kidneys are working.

Newborn babies (0-2 months):
For every 1 kg the baby weighs, they'll be given 25 to 60 mg Ceftazidime per day divided in two doses.

Babies (over 2 months) and children who weigh less than 40 kg
For every 1 kg the baby or child weighs, they'll be given 100 to 150 mg of Ceftazidime per day divided in three doses. Maximum 6 g per day.
Adults and adolescents who weigh 40 kg or more
1 to 2 g of Ceftazidime three times daily. Maximum of 9 g per day.

Patients over 65
The daily dose should not normally exceed 3 g per day, especially if you are over 80 years of age.

Patients with kidney problems
You may be given a different dose to the usual dose. The doctor or nurse will decide how much Ceftazidime you will need, depending on the severity of the kidney disease. Your doctor will check you closely and you may have more regular kidney function tests.

If you are given more Ceftazidime than you should
If you accidentally use more than your prescribed dose, contact your doctor or nearest hospital straight away.

If you forget to use Ceftazidime
If you miss an injection, you should have it as soon as possible. However, if it is almost time for your next injection, skip the missed injection. Don't take a double dose (two injections at the same time) to make up for a missed dose.

If you stop using Ceftazidime
Don't stop taking Ceftazidime unless your doctor tells you to.

If you have any questions ask your doctor or nurse.

4. POSSIBLE SIDE EFFECTS

Like all medicines, Ceftazidime can cause side effects, although not everybody gets them.

Conditions you need to look out for
The following serious side effects have occurred in a small number of people but their exact frequency is unknown:
- **severe allergic reaction**. Signs include **raised and itchy rash**, **swelling**, sometimes of the face or mouth causing **difficulty in breathing**.
- **skin rash,** which may **blister**, and looks like **small targets** (central dark spot surrounded by a paler area, with a dark ring around the edge).
- a **widespread rash** with **blisters** and **peeling skin.** (These may be signs of 'Stevens-Johnson syndrome' or 'toxic epidermal necrolysis').
- **nervous system disorders**: tremors, fits and, in some cases coma. These have occurred in people when the dose they are given is too high, particularly in people with kidney disease.

Contact a doctor or nurse immediately if you get any of these symptoms.

Common side effects
These may affect **up to 1 in 10** people:
- diarrhoea
- swelling and redness along a vein
- red raised skin rash which may be itchy
- pain, burning, swelling or inflammation at the injection site.

Tell your doctor if any of these are troubling you.

Common side effects that may show up in blood tests:
- an increase in a type of white blood cell (eosinophilia)
- an increase in the number of cells that help the blood to clot
- an increase in liver enzymes.

Uncommon side effects
These may affect **up to 1 in 100** people:
- inflammation of the gut which can cause pain or diarrhoea which may contain blood
- thrush - fungal infections in the mouth or vagina

• headache
• dizziness
• stomach ache
• feeling sick or being sick
• fever and chills.
Tell **your doctor** if you get any of these.

Uncommon side effects that may show up in blood tests:
• a decrease in the number of white blood cells
• a decrease in the number of blood platelets (cells that help the blood to clot)
• an increase in the level of urea, urea nitrogen or serum creatinine in the blood.

Other side effects
Other side effects have occurred in a small number of people but their exact frequency is unknown:
• inflammation or failure of the kidneys
• pins and needles
• unpleasant taste in the mouth
• yellowing of the whites of the eyes or skin.

Other side effects that may show up in blood tests:
• red blood cells destroyed too quickly
• an increase in a certain type of white blood cells
• severe decrease in the number of white blood cells.

Reporting of side effects
If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via the Yellow Card Scheme at: www.mhra.gov.uk/yellowcard or search for MHRA Yellow Card in the Google Play or Apple App Store.
By reporting side effects you can help provide more information on the safety of this medicine.

5. HOW TO STORE CEFTAZIDIME INJECTION

Keep out of the sight and reach of children.
Do not use Ceftazidime Injection after the expiry date which is printed on the label and carton.
Store the vial in the outer carton to protect from light.

6. FURTHER INFORMATION

What Ceftazidime Injection contains
Each vial contains 500mg Ceftazidime (as pentahydrate).
The other ingredient is sodium carbonate anhydrous (E500)

What Ceftazidime Injection looks like and contents of the pack
Ceftazidime Injection is a white to cream-coloured powder in a glass vial.
Each carton contains 1, 5, 10, 20 or 50 vials.
Not all pack sizes may be marketed.

Marketing Authorisation Holder
Istituto Biochimico Italiano G. Lorenzini SpA, via Fossignano 2, 04011 Aprilia (LT), Italy

Manufacturer
ACS DOBFAR SpA, 64100 Teramo, Italy

ACS Dobfar S.p.A – via A. Fleming. 2 – 37135 Verona – Italy

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INFORMATION FOR THE HEALTHCARE PROFESSIONAL
The following information is intended for medical or healthcare professionals.
Please refer to the Summary of Product Characteristics for further information.

Instructions for reconstitution
See table for addition volumes and solution concentrations, which may be useful when fractional doses are required.

Route	Amount of diluent to be added (ml)	Approximate availabe volume (ml)	Approximate Concentration (mg/ml)
intramuscular	1.5 ml	1.7 ml	294
intravenous bolus	5 ml	5.2 ml	96

Solutions range in colour from light yellow to amber depending on concentration, diluent and storage conditions used. Within the stated recommendations, product potency is not adversely affected by such colour variations.

Ceftazidime at concentrations between 1 mg/ml and 40 mg/ml is compatible with:
• sodium chloride 9 mg/ml (0.9%) solution for injection
• M/6 sodium lactate injection
• compound sodium lactate injection (Hartmann's solution)
• 5% dextrose injection
• 0.225% sodium chloride and 5% dextrose injection
• 0.45% sodium chloride and 5% dextrose injection
• 0.9% sodium chloride and 5% dextrose injection
• 0.18% sodium chloride and 4% dextrose injection
• 10% dextrose Injection
• Dextran 40 injection 10% in 0.9% sodium chloride injection
• Dextran 40 injection 10% in 5% dextrose Injection
• Dextran 70 injection 6% in 0.9% sodium chloride injection
• Dextran 70 injection 6% in 5% dextrose injection.

Ceftazidime at concentrations between 0.05 mg/ml and 0.25 mg/ml is compatible with Intra-peritoneal Dialysis Fluid (Lactate).

Ceftazidime may be reconstituted for intramuscular use with 0.5% or 1% Lidocaine Hydrochloride Injection.

The contents of a 500 mg vial of ceftazidime for injection, reconstituted with 1.5 ml water for injections, may be added to metronidazole injection (500 mg in 100 ml) and both retain their activity.

Preparation of solutions for bolus injection
1. Insert the syringe needle through the vial closure and inject the recommended volume of diluent. Remove the syringe needle.
2. Shake to dissolve: carbon dioxide is released and a clear solution will be obtained in about 1 to 2 minutes.
3. Invert the vial. With the syringe plunger fully depressed, insert the needle through the vial closure and withdraw the total volume of solution into the syringe (the pressure in the vial may aid withdrawal). Ensure that the needle remains within the solution and does not enter the head space. The withdrawn solution may contain small bubbles of carbon dioxide; they may be disregarded.

These solutions may be given directly into the vein or introduced into the tubing of a giving set if the patient is receiving parenteral fluids. Ceftazidime is compatible with the most commonly used intravenous fluids.

Preparation of solutions for iv infusion

Prepare using a total of 50 ml of compatible diluent, added in TWO stages as below.
1. Introduce the syringe needle through the vial closure and inject 10 ml of diluent.
2. Withdraw the needle and shake the vial to give a clear solution.
3. Do not insert a gas relief needle until the product has dissolved. Insert a gas relief needle through the vial closure to relieve the internal pressure.
4. Transfer the reconstituted solution to final delivery vehicle (e.g. mini-bag or burette-type set) making up a total volume of at least 50 ml, and administer by intravenous infusion over 15 to 30 min.

Note: To preserve product sterility, it is important that the gas relief needle is not inserted through the vial closure before the product has dissolved.

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

Posology
Adults and children ≥ 40 kg

Intermittent Administration	
Infection	***Dose to be administered***
Broncho-pulmonary infections in cystic fibrosis	100 to 150 mg/kg/day every 8 h, maximum 9 g per day[1]
Febrile neutropenia	2 g every 8 h
Nosocomial pneumonia	
Bacterial meningitis	
Bacteraemia*	
Bone and joint infections	1-2 g every 8 h
Complicated skin and soft tissue infections	
Complicated intra-abdominal infections	
Peritonitis associated with dialysis in patients on CAPD	
Complicated urinary tract infections	1-2 g every 8 h or 12 h
Peri-operative prophylaxis for transuretheral resection of prostate (TURP)	1 g at induction of anaesthesia, and a second dose at catheter removal
Chronic suppurative otitis media	1 g to 2 g every 8h
Malignant otitis externa	
Continuous infusion	
Infection	***Dose to be administered***
Febrile neutropenia	Loading dose of 2 g followed by a continuous infusion of 4 to 6 g every 24 h[1]
Nosocomial pneumonia	
Broncho-pulmonary infections in cystic fibrosis	
Bacterial meningitis	
Bacteraemia*	
Bone and joint infections	
Complicated skin and soft tissue infections	
Complicated intra-abdominal infections	
Peritonitis associated with dialysis in patients on CAPD	

[1] In adults with normal renal function 9 g/day has been used without adverse effects. * When associated with, or suspected to be associated with, any of the infections listed in section 4.1 of the SPC.

Children < 40 kg

Infants and toddlers > 2 months and children < 40 kg

Intermittent Administration	
Infection	***Usual dose***
Complicated urinary tract infections	100-150 mg/kg/day in three divided doses, maximum 6 g/day
Chronic suppurative otitis media	
Malignant otitis externa	
Neutropenic children	150 mg/kg/day in three divided doses, maximum 6 g/day
Broncho-pulmonary infections in cystic fibrosis	
Bacterial meningitis	
Bacteraemia*	
Bone and joint infections	100-150 mg/kg/day in three divided doses, maximum 6 g/day
Complicated skin and soft tissue infections	
Complicated intra-abdominal infections	
Peritonitis associated with dialysis in patients on CAPD	
Continuous infusion	
Febrile neutropenia	Loading dose of 60-100 mg/kg followed by a continuous infusion 100-200 mg/kg/day, maximum 6 g/day
Nosocomial pneumonia	
Broncho-pulmonary infections in cystic fibrosis	
Bacterial meningitis	
Bacteraemia*	
Bone and joint infections	
Complicated skin and soft tissue infections	
Complicated intra-abdominal infections	
Peritonitis associated with dialysis in patients on CAPD	
* Where associated with, or suspected to be associated with, any of the infections listed in section 4.1 of the SPC.	

Neonates and infants ≤ 2 months

Intermittent Administration	
Most infections	25-60 mg/kg/day in two divided doses[1]
[1] In neonates and infants ≤ 2 months, the serum half life of ceftazidime can be three to four times that in adults.	

Elderly: The daily dose should not normally exceed 3 g in those over 80 years of age.

Hepatic impairment: Close clinical monitoring for safety and efficacy is advised.

Renal impairment: Dosage should be reduced. An initial loading dose of 1 g should be given. Maintenance doses should be based on creatinine clearance:

Recommended maintenance doses in renal impairment – intermittent infusion

Adults and children > 40 kg

Creatinine clearance (ml/min)	Approx. serum creatinine µmol/l (mg/dl)	Recommended unit dose of ceftazidime (g)	Frequency of dosing (hourly)
50-31	150-200 (1.7-2.3)	1	12
30-16	200-350 (2.3-4.0)	1	24
15-6	350-500 (4.0-5.6)	0.5	24
<5	>500 (>5.6)	0.5	48

Children < 40 kg

Creatinine clearance (ml/min)**	Approx. serum creatinine* µmol/l (mg/dl)	Recommended individual dose (mg/kg body weight)	Frequency of dosing (hourly)
50-31	150-200 (1.7-2.3)	25	12
30-16	200-350 (2.3-4.0)	25	24
15-6	350-500 (4.0-5.6)	12.5	24
<5	>500 (>5.6)	12.5	48
* Guideline values ** Estimated based on body surface area, or measured.			

Close clinical monitoring is advised.

Recommended maintenance doses in renal impairment –continuous infusion

Adults and children ≥ 40 kg

Creatinine clearance (ml/min)**	Approx. serum creatinine µmol/l (mg/dl)	Frequency of dosing (hourly)
50 – 31	150-200 (1.7-2.3)	Loading dose of 2g followed by 1g to 3g/24 hours
30 – 16	200-350 (2.3-4.0)	Loading dose of 2g followed by 1g /24 hours
≤ 15	> 350 (>4.0)	Not evaluated
** Estimated based on body surface area, or measured.		

Caution is advised in dose selection. Close clinical monitoring is advised.

Children < 40 kg
If continuous infusion is used in children with renal impairment, the creatinine clearance should be adjusted for body surface area or lean body mass. Close clinical monitoring is advised.

Haemodialysis
The serum half-life during haemodialysis ranges from 3 to 5 h.
Following each haemodialysis period, the maintenance dose of ceftazidime recommended in the below table should be repeated.

Peritoneal dialysis

Ceftazidime may be used in peritoneal dialysis and continuous ambulatory peritoneal dialysis (CAPD).

In addition to intravenous use, ceftazidime can be incorporated into the dialysis fluid (usually 125 to 250 mg for 2 litres of dialysis solution).

For patients in renal failure on continuous arterio-venous haemodialysis or high-flux haemofiltration in intensive therapy units: 1 g daily either as a single dose or in divided doses. For low-flux haemofiltration, follow the dose recommended under renal impairment.

For patients on veno-venous haemofiltration and veno-venous haemodialysis, follow the dosage recommendations in the tables below.

Continuous veno-venous haemofiltration dose guidelines

Residual renal function (creatinine clearance ml/min)	Maintenance dose (mg) for an ultrafiltration rate (ml/min) of [1]:			
	5	16.7	33.3	50
0	250	250	500	500
5	250	250	500	500
10	250	500	500	750
15	250	500	500	750
20	500	500	500	750
[1] Maintenance dose to be administered every 12h				

Continuous veno-venous haemodialysis dose guidelines

Residual renal function (creatinine clearance ml/min)	Maintenance dose (mg) for a dialysate in flow rate of [1]					
	1.0 litre/h			2.0 litre/h		
	Ultrafiltration rate (litres/h)			Ultrafiltration rate (litres/h)		
	0.5	1.0	2.0	0.5	1.0	2.0
0	500	500	500	500	500	750
5	500	500	750	500	500	750
10	500	500	750	500	750	1000
15	500	750	750	750	750	1000
20	750	750	1000	750	750	1000
[1] Maintenance dose to be administered every 12h						