

Cefepime

Antibiotic Class:

Fourth-Generation Cephalosporin

Antimicrobial Spectrum:

Methicillin-susceptible Staphylococcus aureus (MSSA), Coagulase negative Staphylococci, Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, Neisseria meningitides, Neisseria gonorrhoeae, E. Coli, P. aeruginosa

Mechanism of Action:

Cephalosporins exert bactericidal activity by interfering with bacterial cell wall synthesis and inhibiting cross-linking of the peptidoglycan. The cephalosporins are also thought to play a role in the activation of bacterial cell autolysins which may contribute to bacterial cell lysis.

Pharmacodynamics

Cephalosporins exhibit time-dependent killing ($T > MIC$)

Pharmacokinetics:

Dose of 1g

C_{max}: 66-82 mcg/L

Half-life: 2-2.3 hours

Volume of distribution: 20.5L

Table 11

Adverse Reactions:

Hypersensitivity: Maculopapular rash, Urticaria, Pruritis, Anaphylaxis/angioedema, eosinophilia

Hematologic: Hypoprothrombinemia, Neutropenia, Leukopenia, Thrombocytopenia

GI: Diarrhea, *C. difficile* disease

Renal: Interstitial nephritis

Table 14

Dosage:

IV: 500mg, 1g, 2g

Dosing in adults:

Febrile neutropenia: 2g IV q8h x 7 days or until resolution of neutropenia

Intra-abdominal infection: 2g IV q12h x 7-10 days

Pneumonia: 1-2 g IV q12h x 10 days

Meningitis: 2g IV q12h

UTI: 0.5-1g IV/IM q12h x 7-10 days

Dosing in pediatrics:

See Table 12

Disease state based dosing:

Renal failure: CrCl > 60mL/min: standard dosing
CrCl 30-60mL/min: 1-2g q24h
CrCl 11-29mL/min: 0.5-1g q24h
CrCl < 10mL/min: 0.25-0.5g q24h

Hepatic failure: No dosing changes recommended at this time.

Dosing during Continuous Renal Replacement Therapy

CVVH (Continuous venovenous hemofiltration): 1-2g IV q12h

CVVHD (Continuous venovenous hemodialysis): 2g IV q12h

CVVHDF (Continuous venovenous hemodiafiltration) 2g IV q12h

Note: CVVH is mainly for fluid removal alone. Many institutions will employ more CVVHD or CVVHDF which combine dialysis with fluid removal.

Contraindications/Warnings/Precautions:

Precautions: hypersensitivity to penicillins, history of gastrointestinal disease, particularly colitis, renal impairment, risk factors for altered prothrombin time (renal or hepatic impairment, poor nutritional status, prolonged course of antibiotic therapy)

Drug Interactions:

Chloramphenicol: decreased ceftazidime effectiveness

Live Typhoid Vaccine: decreased immunological response to the typhoid vaccine

Pregnancy Risk Factor:

B

Monitoring parameters:

Therapeutic: Culture and sensitivities, serum levels, signs and symptoms of infection, white blood cell count

Toxic: Urinalysis, BUN, SCr, AST and ALT, skin rash, Neutropenia and leukopenia, Prothrombin time in patients with renal or hepatic impairment or poor nutritional state, as well as patients receiving a protracted course of antimicrobial therapy, and patients previously stabilized on anticoagulant therapy.

Brand names/Manufacturer: Maxpime®/Bristol-Myers Squibb