

Ertapenem

Antibiotic Class:

Carbapenem

Antimicrobial Spectrum:

Aerobic gram-positive microorganisms: *S. aureus* (methicillin susceptible strains only), *S. pyogenes*, *S. agalactiae*

Aerobic gram-negative microorganisms: *E. coli*, *H. influenzae*, *M. catarrhalis*, *K. pneumoniae*

Anaerobic microorganisms: *Bacteroides fragilis* and other *Bacteroides* species, *C. clostridioforme*, *Peptostreptococcus* species (Table 1)

Mechanism of Action:

Cause rapid bacterial cell death by covalently binding to penicillin-binding proteins (PBPs) involved in the biosynthesis of mucopeptides in bacterial cell walls. Bactericidal effects result through inhibition of cellular growth and division and the loss of cell wall integrity, eventually causing cell wall lysis. The primary target is PBP 2.

Pharmacodynamics:

Carbapenems produce time-dependent killing

Pharmacokinetics:

Cmax: 155mcg/ml; Half-life: 3.8 hours; Volume of distribution: 8.2L; Table 2

Adverse Effects:

Gastrointestinal: Nausea, diarrhea, abdominal pain, vomiting, constipation, GERD

Cardiovascular System: Edema, chest pain, tachycardia

Central Nervous System: Headache, altered mental status (confusion, disorientation, somnolence), seizures

Hematologic: Decreases in hemoglobin and hematocrit, decrease in platelet counts, eosinophilia

Genitourinary: Vaginitis

Renal: Renal insufficiency

Hepatic: Increased serum transaminases and alkaline phosphatase

Respiratory: Dyspnea, cough, pharyngitis, and "respiratory distress"

Dermatologic: Erythema, pruritis, rash; extravasation at injection site, phlebitis, thrombophlebitis

Dosage:

Sterile lyophilized 1 g powder for intravenous infusion or for intramuscular injection

Acute pelvic infection: 1 g IV/IM daily for 3-10 days

Community-acquired pneumonia: 1 g IV/IM daily for 10-14 days

Intra-abdominal infections: 1 g IV/IM daily for 5-14 days

Skin/skin structure infections: 1 g IV/IM daily for 7-14 days

Urinary tract infection: 1 g IV/IM daily for 10-14 days

Disease state based dosing:

Renal Failure: For the patients with creatinine clearance (CrCl) equal to or greater than 30 ml/min, no adjustment is necessary. In patients with CrCl < 30, give 500 mg every 24 hours.

Hepatic failures: Dosage adjustment is not required.

Contraindications/Warnings/Precautions:

Contraindications : Prior anaphylactic reactions to beta-lactams, hypersensitivity to amide-type anesthetics

Precautions: Known or suspected CNS disorders including seizure history (increased risk for seizures)

Drug Interactions:

Probenecid (moderate severity): Probenecid inhibits the renal excretion of ertapenem thereby increasing its plasma concentrations and prolonging its elimination half-life.

Pregnancy:

Category B: No evidence of risk in humans but studies inadequate.

Monitoring Requirements:

Therapeutic: Culture and sensitivity, CBC w/differential, urinalysis, temperature, pulmonary function tests, improvement of clinical signs/symptoms of infection (eg, pulmonary function in pneumonia, pain in UTI)

Toxicity: CBC; Vital signs post-infusion in patients with risk factors for hypersensitivity (eg, history of allergies or sensitivity to cephalosporins) (signs of anaphylaxis); Neurologic evaluation in patients developing focal tremors, myoclonus, or seizures during therapy; Signs/symptoms of toxicity (eg, rash, GI disturbances, mental status changes, seizure activity, local complications (phlebitis))

Brand names/Manufacturer: Invanz/Merck in the following countries: Australia, United Kingdom, Singapore, New Zealand, Germany, Ireland, France, Austria, Sweden, Israel, Finland, and Belgium