Ceftriaxone

Antibiotic Class:
Third-Generation Cephalosporin

Antimicrobial Spectrum:
*Staphylococcus aureus* (methicillin susceptible), Coagulase negative Staphylococci, *Streptococcus pneumoniae* (penicillin susceptible), *Streptococcus* spp., *Haemophilus influenzae*, *Moraxella catarrhalis*, *Neisseria meningitides*, *Neisseria gonorrhoeae*, *Enterobacteriaceae*, *E. coli*

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 bacterical cell autolysins which may contribute to bacterial cell lysis.

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

Pharmacokinetics:
Dose of 1g
Cmax: 123-151mcg/L
Half-life: 8 hours
Volume of distribution: 10.7L
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: 1g, 2g, 250mg, 500mg

Dosing in adults:
Meningitis: 2g IV q24h
Intraabdominal infections: 1-2g IV q12-24h
Pelvic inflammatory disease: 1-2g IV q12-24h
Bone and/or joint infection: 1-2g IV q12-24h
Gonorrhea: 250mg IM x 1 dose

Dosing in pediatrics:
50-100mg/kg divided q12-24h
Table 12
**Disease state based dosing:**
Renal failure: No dosing changes recommended at this time.
Hepatic failure: No dosing changes recommended at this time.

**Dosing during Continuous Renal Replacement Therapy**
CVVH (Continuous venovenous hemofiltration): 2g IV q12-24h
CVVHD (Continuous venovenous hemodialysis): 2g IV q12-24h
CVVHDF (Continuous venovenous hemodiafiltration) 2g IV q12-24h
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:**
Contraindications: Hyperbilirubinemic neonates; increased risk for bilirubin encephalopathy (kernicterus)
Precautions: hypersensitivity to penicillins, history of gastrointestinal disease, particularly colitis, renal impairment

**Drug Interactions:**
Cyclosporine: an increased risk of cyclosporine toxicity (renal dysfunction, cholestasis, paresthesias)
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:** Rocephin®/Roche