

# Ampicillin

## Antibiotic Class:

Penicillin (aminopenicillin)

## Antimicrobial Spectrum:

Gram-positive: *Streptococcus spp.*, *Enterococcus spp.*, *Listeria monocytogenes*

Gram-negative: *H. influenzae*, *E. coli*, *Proteus mirabilis*, *Salmonella spp.*, *Shigella spp.*

## Mechanism of Action:

Exerts bactericidal activity via inhibition of bacterial cell wall synthesis by binding one or more of the penicillin binding proteins (PBPs). Exerts bacterial autolytic effect by inhibition of certain PBPs related to the activation of a bacterial autolytic process.

## Pharmacodynamics:

Penicillins produce time-dependent killing

## Pharmacokinetics:

Cmax: 40mcg/ml; Half-life: 1-1.3h; Table 6

## Adverse Effects:

Hematologic: anemia, thrombocytopenia, neutropenia, agranulocytosis

CNS: seizures

Renal: nephrotoxicity, interstitial nephritis

Hepatic: transient increases in transaminases

Other: Jarisch-Herxheimer Reaction (fever, chills, sweating, tachycardia, hyperventilation, flushing, and myalgia)

## Dosage:

Adult: 250-500mg po q6h

1-2g IV q4h

Pediatric:  $\geq 1$  month and  $< 40$  kg: 50-200 mg/kg day IV in 4-6 divided doses

$< 1$  week: 25 mg/kg IV/IM q 8-12h

$\geq 1$  week and  $< 1$  month: 25 mg/kg IV/IM q6-8h

$> 40$  kg: usual adult dose

Disease state based dosing:

Renal failure: CrCL 10-50 mL/min: Extend dosing interval to q 6-12h

CrCL  $< 10$  mL/min: Extend dosing interval to q8-16h

## Contraindications/Warnings/Precautions:

Contraindications: hypersensitivity to ampicillin or other penicillins

Precautions:

- Cephalosporin hypersensitivity
- Patients with mononucleosis are more likely to develop a skin rash

**Drug Interactions:**

Allopurinol – higher probability of ampicillin rash; Atenolol – decreased atenolol effectiveness; Contraceptives - decreased contraceptive effectiveness; Lansoprazole – loss of ampicillin efficacy; Live Typhoid Vaccine - decreased immunological response to the typhoid vaccine; Omeprazole – loss of ampicillin efficacy; Pantoprazole – loss of ampicillin efficacy; Probenecid - increased ampicillin levels; Rabeprazole – loss of ampicillin efficacy

**Pregnancy:**

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

**Monitoring Requirements:**

Therapeutic: Culture and sensitivities, signs and symptoms of infection

Toxic: Periodic CBC, urinalysis, BUN, Creatinine, AST and ALT, diarrhea, skin rash

**Brand names/Manufacturer:**

Available by many names and manufacturers