

Ethambutol (EMB)

Antibiotic Class: N-substituted ethylenediamine

Antimicrobial Spectrum: *M. tuberculosis* and other mycobacteria, including *M. avium*

Mechanism of Action:

Ethambutol inhibits arabinotransferases involved in the biosynthetic pathway of mycobacterial cell wall

Pharmacodynamics:

EMB generally is bacteriostatic at the doses that can be achieved in humans. As such, keeping the serum concentrations above the MIC for the entire dosing interval would be desirable from a theoretical standpoint.

Pharmacokinetics:

Cmax: 2-6 mg/L; Tmax: about 2-3 hours; Bioavailability: at least 50%, possibly higher; not directly measured against IV dosage form. Protein binding: 20-30%

Adverse Effects:

Optic neuritis is dose and concentration-dependent, being uncommon at 25 mg per kg daily, more common at higher daily doses, and more common if standard doses are given to patients with renal dysfunction. Patients should be questioned regarding visual problems, and color vision tested using Ishihara plates. Renal clearance of urates is decreased by ethambutol.

Dosage:

PO: 400 mg tablets

Usual dose: 25 mg per kg daily, 50 mg per kg in twice-weekly regimens

Disease State Based Dosing:

Hepatic failure: No specific recommendations, but EMB is partially metabolized so patients should be followed for possible visual changes

Renal failure: Adjustment is required for patients in renal failure or on hemodialysis. The usual daily dose should be given only 3 times weekly.

Contraindications/Warnings/Precautions: Caution in renal failure

Drug Interactions: None clearly established

Pregnancy: Generally considered safe.

Monitoring Requirements:

Toxic: baseline visual acuity and red-green color discrimination

Brand Names/Manufacturer: Myambutol (Wyeth), generics