

TB Medications: Key Side Effects and Toxicities

Side Effects	vs.	Toxicity
<p>Unpleasant reactions</p> <p>Not damaging to health</p> <p>May require changes in therapy</p>	vs.	<p>Severe reactions</p> <p>May require treatment and/or hospitalization</p> <p>Requires changes to treatment regimen</p>

Mild reactions can usually be managed with treatment directed at controlling the symptoms; severe reactions usually require the offending drug(s) to be discontinued.

Management of serious reactions requires expert consultation.

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Reference: International Council of Nurses and Curry International Tuberculosis Center. Nursing guide for managing side effects to drug-resistant TB treatment. Geneva. 2018.

At a Glance: Adverse Drug Reactions

Drug	GI	Hepato	Muscu	Neuro	Hema	Renal	Endo	Cardiac
Amikacin (AM)	-	-	-	✓	-	✓	-	-
Bedaquiline (BDQ)	✓	✓	✓	-	-	-	-	✓
Clofazamine (CFZ)	✓	✓	-	-	-	-	-	-
Cycloserine (CS)	✓	-	-	✓	-	-	-	-
Delamanid (DLM)	✓	-	-	-	-	-	-	✓
Ethambutol (EMB)	✓	-	-	✓	-	-	-	-
Ethionamide (ETA)	✓	✓	✓	-	✓	-	✓	-
Imipenem (IMP)	✓	-	-	-	-	-	-	-
Isoniazid (INH)	✓	✓	-	✓	✓	-	-	-
Levofloxacin (LFX)	✓	-	✓	-	-	-	-	✓
Linezolid (LZD)	✓	-	-	✓	✓	-	-	-
Meropenem (MPM)	✓	-	-	-	✓	-	-	-
Moxifloxacin (MFX)	✓	-	✓	-	-	-	-	✓
Pyrazinamide (PZA)	✓	✓	✓	-	-	-	-	-
Rifabutin (RFB)	✓	✓	-	-	✓	-	-	-
Rifampin (RIF)	✓	✓	-	-	✓	-	-	-
Rifapentine (RPT)	✓	✓	-	-	✓	-	-	-
Streptomycin (SM)	-	-	-	✓	-	✓	-	-

Side Effects/Toxicities with Causitive Agents

GASTROINTESTINAL (GI)

ETA, PZA – Nausea, vomiting, bloating, discomfort, and/or metallic taste.

Less common: BDQ, CFZ, CS, DLM, EMB, IMP, INH, LFX/MFX, LZD, MPM, RFB, RIF, RPT

ETA - Frequent and/or loose stool and/or abdominal cramping.

Less common: LFX/MFX, LZD

Monitor for signs of hepatitis, GI bleeding, and dehydration.

HEPATOTOXICITY (HEPATO)

BDQ, CFZ, ETA, INH, PZA, RFB, RIF, RPT - Nausea, vomiting **with** abdominal pain, fatigue, and loss of appetite; later stages may include fever, rash and/or jaundice.

Monitor for signs/symptoms of hepatitis.

MUSCULOSKELETAL (MUSCU)

BDQ, ETA, LFX/MFX, PZA - Pain and tenderness of the muscles and joints and/or tendon inflammation. *Monitor for signs of acute swelling, erythema, and warmth at the site of muscle or joint pain.*

NEUROLOGICAL (NEURO)

EMB, LZD - Optic Neuritis - Vision changes of color and acuity and/or pain around the eye or with eye movement. *Monitor for temporary vision loss and/or acute vision changes. RFB used in high doses can cause redness and/or eye pain.* Less common: ETA

AM, SM - Vestibular/Ototoxicity - Combination of hearing loss, ringing in the ears, dizziness, and/or loss of balance. *Monitor for abnormal gait such as weaving and staggering. Monitor audiograms.*

LZD, INH, CS - Peripheral Neuropathy - Tingling, prickling, burning or numbness sensation in toes, balls of feet, fingers or hands. *Monitor for changes in sensation in lower extremities.* Less common: EMB, ETA, LFX/MFX

CS - Depression - Mood changes, agitation, irritability, feelings of hopelessness, sleep disturbances, suicidal thoughts, nightmares, delusions, hallucinations, and/or severe mood swings. *Monitor for signs of mental health changes including depression and psychosis.* Less common: ETA, INH, LFX/MFX (usually with high dose)

CS, INH - Seizure - Tonic-clonic movements, convulsions, and/or altered mental status. *Monitor serum electrolytes and creatinine and observe for signs of seizure.* Less common: IMP, LFX/MFX, LZD, MPM

HEMATOLOGICAL (HEMA)

LZD, RFB, RIF - Anemia - Fatigue, shortness of breath, and/or developing or worsening pallor. *Monitor for signs of exertion, hemoptysis, and/or changes in pallor including pale conjunctiva.* Less common: MPM

LZD, RIF, RFB, RPT - Thrombocytopenia - Easy bruising and/or nose bleeds. *Monitor for bruises, bleeding gums, and/or petechiae.* Less common: ETA

RENAL TOXICITY (RENAL)

AM, SM - Acute Renal Failure - Decreased production of urine, lower limb edema, mental status changes, and/or shortness of breath. *Monitor for changes in pattern of urination, pitting edema in the feet, ankles and calves, impaired mental status, and shortness of breath.*

AM, SM - Electrolyte Disturbances - Fatigue, weakness, muscle aches/spasms, change in mental status, nausea/vomiting, and/or confusion. *Monitor for signs of confusion, fatigue, and/or extreme weakness.*

ENDOCRINE (ENDO)

ETA - Hypothyroidism - Fatigue, sleepiness, unexplained weight gain, dry skin, constipation, muscle aches, hair loss/dryness, impaired memory, slow heart rate, decreased libido, depression, and/or feeling cold even in warm environments. *Monitor for signs of goiter.*

CARDIAC

BDQ, DLM, LFX/MFX - QTc Prolongation - Change in heartbeat, dizziness, fainting, and/or palpitations. *Monitor for signs and symptoms of cardiac toxicity including tachycardia, syncope, and/or weakness and dizziness.*

Other Adverse Drug Reactions

HYPERSENSITIVITY

Any anti-TB drug - Anaphylaxis - Rapid onset of rash, swelling of airway, hypotension, and/or gastrointestinal symptoms. *Monitor for symptoms and refer for immediate medical attention.*

Any anti-TB drug - Rash - Skin rash and/or itching. *Monitor for fever, urticaria, blistering of the skin, and/or swelling of the lips, eyes, face, hands, feet, or throat and signs of serious allergic reaction. Other serious reactions are Drug Rash with Eosinophilia and Systemic Symptoms (DRESS), Steven's Johnsons Syndrome, and Toxic Epidural Necrolysis (TEN).*

HYPERSALIVATION

Any anti-TB drug, ETA (most common) - Excessive saliva production. *Monitor for other conditions that may cause excessive salivation. Usually anticipatory CNS response to anticipated side effects of TB medications.*