ISONIAZID (eye-soe-nye-a-zid)

**Classification**
Antituberculars

**Pregnancy Category C**

**Indications**
First-line therapy of active tuberculosis, in combination with other agents. Prevention of tuberculosis in patients exposed to active disease (latent).

**Action**
Inhibits mycobacterial cell wall synthesis and interferes with metabolism. Therapeutic Effects: Bacteriostatic or bactericidal action against susceptible mycobacteria.

**Pharmacokinetics**
Absorption: Well absorbed following PO or IM administration. Distribution: Widely distributed; readily crosses the blood-brain barrier. Crosses the placenta; enters breast milk in concentrations equal to plasma. Protein Binding: 10–20%. Metabolism and Excretion: 50% metabolized by the liver by N-acetyltransferase (rate of acetylation is genetically determined [slow acetylators have low isoniazid levels and increased risk of toxicity; fast acetylators have high isoniazid levels and increased risk for treatment failure]); 50% excreted unchanged by the kidneys. Half-life: 1–4 hr in patients with normal renal and hepatic function; 0.5–1.6 hr in fast acetylators; 2–5 hr in slow acetylators.

**Contraindications/Precautions**
Contraindicated in: Hypersensitivity; Acute liver disease; Previous hepatitis from isoniazid.

Use Cautiously in: History of liver damage or chronic alcohol ingestion. Black and Hispanic women, women in the postpartum period, or patients ≥70 yr (70% risk of drug-induced hepatitis). Severe renal impairment (dose reduction may be necessary). Malnourished patients, patients with diabetes, or chronic alcoholics (70% risk of neuropathy). OB, Lactation: Although safety is not established, isoniazid has been used with ethambutol to treat tuberculosis in pregnant women without harm to the fetus.

**Adverse Reactions/Side Effects**

**Interactions**
Drug-Drug: Additive CNS toxicity with other antituberculars. BCG vaccine may not be effective during isoniazid therapy. Isoniazid inhibits the metabolism of phenytoin. Aluminum-containing antacids may decrease absorption. Psychotic reactions and coordination difficulties may result with disulfiram. Concurrent administration of prednisone may prevent neuropathy. Risk of hepatotoxicity with other hepatotoxic agents including alcohol, acetaminophen, and rifampin. Isoniazid inhibits the metabolism of clopidogrel. Concurrent use with pyridoxine may prevent neuropathy. DRUG-INDUCED HEPATITIS, jaundice, vomiting.

**Route/Dosage**

<table>
<thead>
<tr>
<th>Route</th>
<th>Initial Dose</th>
<th>Peak</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>300 mg/day</td>
<td>300 mg/day</td>
<td>up to 3 times weekly</td>
</tr>
<tr>
<td>IM</td>
<td>15 mg/kg</td>
<td>15 mg/kg</td>
<td>up to 3 times weekly</td>
</tr>
</tbody>
</table>

**NURSING IMPLICATIONS**

**Assessment**
Mycobacterial studies and susceptibility tests should be performed prior to and periodically throughout therapy to detect possible resistance. About 50% to 65% of patients become bacteriologically negative.

**Implementation**

- Monitor serum levels and renal/hepatic function weekly.
- Monitor LFT weekly.
- Evaluate patient for neurotoxicity weekly.
- Maintain adequate hydration.

**Patient/Family Teaching**

- The need to take this medication as prescribed, even during times of illness, long-term therapy, or when feeling well.
- The importance of reporting symptoms of liver damage, such as nausea, vomiting, and jaundice.
- The importance of reporting symptoms of neuropathy, such as peripheral motor/sensory disturbances, balance difficulties, and coordination problems.

**Evaluation**

- Therapeutic: Clinical and bacteriologic cure of tuberculosis.
of Caucasians, Black, South Indians and Mexicans are slow acetylators at risk for toxicity, while 80 to 90% of Eskimos, Japanese, and Chinese are rapid acetylators at risk for decreased levels and treatment failure.

- **Lab Test Considerations:** Hepatic function should be evaluated prior to and monthly throughout therapy. Increased AST, ALT, and serum bilirubin may indicate drug-induced hepatitis. Black and Hispanic women, postpartum women, and patients >50 yr are at highest risk. The risk is lower in children; therefore, liver function tests are usually ordered less frequently for children.

- **Toxicity and Overdose:** If inadvertent overdose occurs, treatment with pyridoxine (vitamin B) is instituted.

**Potential Nursing Diagnoses**

- Risk for infection (Indications)
- Noncompliance (Patient/Family Teaching)

**Implementation**

- **PO:** May be administered with food or antacids if GI irritation occurs, although antacids containing aluminium should not be taken within 1 hr of administration.
- **IM:** Medication may cause discomfort at injection site. Massage site after administration and rotate injection sites.
- Solution may form crystals at low temperatures; crystals will redissolve upon warming to room temperature.

**Patient/Family Teaching**

- Advise patient to take medication as directed. Take missed doses as soon as possible unless almost time for next dose: do not double up on missed doses. Emphasize the importance of continuing therapy, even after symptoms have subsided.
- Therapy may be continued for 6 mo– 2 yr.
- Advise patient to notify health care professional promptly if signs and symptoms of hepatitis (yellow eyes and skin, nausea, vomiting, anorexia, dark urine, unusual tiredness, or weakness) or peripheral neuropathy (numbness, tingling, paresthesia) occur. Pyridoxine may be used concomitantly to prevent neuropathy. Any changes in usual acuity, eye pain, or blurred vision should also be reported immediately.
- Caution patient to avoid the use of alcohol during this therapy, as this may increase the risk of hepatotoxicity. Ingestion of Swiss or Cheshire cheeses, fish (tuna, skipjack, and sardines), and possibly teratogenic-containing foods should also be avoided, as they may result in redness or itching of the skin, hot feeling, rapid or pounding heartbeat, sweating, chills, cold clammy feeling, headache, or light-headedness.
- Emphasize the importance of regular follow-up physical and ophthalmologic exams to monitor progress and to check for side-effects.

**Evaluation/Desired Outcomes**

- Resolution of signs and symptoms of tuberculosis.
- Negative sputum cultures.
- Prevention of activation of tuberculosis in persons known to have been exposed.

**Why was this drug prescribed for your patient?**