streptomycin (strep-toe-my-een)

**Classification**
Therapeutic: anti-infective
Pharmacologic: aminoglycosides

**Pregnancy Category D**

**Indications**
In combination with other agents in the management of active tuberculosis. In combination with other agents in the management of serious enterococcal or gram-negative infections.

**Action**
Inhibits protein synthesis in bacteria at level of 30S ribosome. Therapeutic Effects: Bactericidal action. Spectrum: Notable for activity against: Enterococci (synergy with a penicillin is required). Also active against Mycobacterium.

**Pharmacokinetics**
Absorption: Well absorbed after IM and intra-peritoneal administration. Negligible absorption when administered orally.
Distribution: Widely distributed throughout extracellular fluid; crosses the placenta; small amounts enter breast milk. Poor penetration into CSF.
Metabolism and Excretion: Excretion is 90% renal.
Half-life: 2–4 hr (increased in renal impairment).

**TIME/ACTION PROFILE (blood levels†)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>rapid</td>
<td>30–90 min</td>
<td>N/A</td>
</tr>
</tbody>
</table>

†All parenterally administered aminoglycosides

**Contraindications/Precautions**
Contraindicated in: Hypersensitivity; Cross-sensitivity among aminoglycosides may occur.
Use Cautiously in: Renal impairment (dose adjustments necessary); Blood level monitoring useful in preventing ototoxicity and nephrotoxicity; Hearing impairment; Geriatric patients and premature infants (difficulty in assessing auditory and vestibular function, age-related renal impairment); Neuronal diseases such as carcinoid syndrome, pituitary tumors (dosage should be based on ideal body weight); Neonates (increased risk of neurotoxicity; difficulty in assessing auditory and vestibular function, immature renal function); Pregnancy (may cause congenital deafness); Lactation (safety not established).

**Adverse Reactions/Side Effects**

**Interactions**
Drug-Drug: Inactivated by penicillins and cephalosporins when coadministered to patients with renal insufficiency. Possible respiratory paralysis when inhaled anesthetics or neuromuscular blockers are used; increased incidence of ototoxicity with loop diuretics; increased incidence of nephrotoxicity with other nephrotoxic drugs.

**Route/Dosage**
IM (Adults): Tuberculosis—1 g/day initially, decreased to 1 g 2–3 times weekly; other infections—250 mg–1 g q 6 hr or 500 mg–2 g q 12 hr.
IM (Children): Tuberculosis—20 mg/kg q 6 hr (not to exceed 1 g/day); other infections—5–10 mg/kg q 6 hr or 10–20 mg/kg q 12 hr.

**NURSING IMPLICATIONS**

**Assessment**
- Assess patient for infection (trial signs, wound appearance, sputum, urine, stool, WBC) at beginning of and throughout therapy.
- Obtain specimens for culture and sensitivity before initiating therapy. First dose may be given before receiving results.
- Evaluate eighth cranial nerve function by audiometry before and throughout therapy. Hearing loss is usually in the high-frequency range. Prompt recognition and intervention are essential in preventing permanent damage. Also monitor for vom-

- Cardiac drug name
- Genetic Implication
- OPTIMAL indicates more frequent; suboptimal indicates most frequent
**Tibular Dysfunction (Vertigo, Ataxia, Nausea, Vomiting)**: Eighth cranial nerve dysfunction is associated with persistently elevated aminoglycoside levels. Aminoglycosides should be discontinued if tinnitus or subjective hearing loss occurs.

- **Monitor intake and output and daily weight to assess hydration status and renal function.**
- **Assess patient for signs of superinfection (fever, upper respiratory infection, vaginal itching or discharge, increasing malaise, diarrhea). Report to physician or other health care professional.**

**Lab Test Considerations**: Monitor renal function by urinalysis, specific gravity, BUN, creatinine, and CrCl before and throughout therapy.

- **May cause increased BUN, AST, ALT, serum alkaline phosphatase, bilirubin, creatinine, and LDH concentrations.**
- **May cause decreased serum calcium, magnesium, potassium, and sodium concentrations.**

**Hydroxy and Overdose**: Blood levels should be monitored periodically during therapy. Timing of blood levels is important in interpreting results. Draw blood for peak levels 1 hr after IM injection and 30 min after a 30-min IV infusion is completed. Trough levels should be drawn just before next dose. Peak level should not exceed 25 mcg/mL.

**Potential Nursing Diagnoses**
- Risk for infection (Indications)
- Disturbed sensory perception (auditory) (Side Effects)
- Deficient knowledge, related to medication regimen (Patient/Family Teaching)

**Implementation**
- **Keep patient well hydrated (1500–2000 mL/day) during therapy.**
- **IM**: Administration should be deep into a well-developed muscle. Alternate injection sites.

**Patient/Family Teaching**
- **Instruct patient to report signs of hypersensitivity, tinnitus, vertigo, hearing loss, rash, diarrhea, or difficulty urinating.**
- **Advise patient of the importance of drinking plenty of fluids.**

**Evaluation/Desired Outcomes**
- Resolution of the signs and symptoms of infection. If no response is seen within 3–5 days, new cultures should be taken.

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