methazolamide (meth-a-zole-a-mide)

**Classification**
Therapeutic: Diuretics
Pharmacologic: carbonic anhydrase inhibitors

**Pregnancy Category C**

**Indications**
Lowering of intraocular pressure in the treatment of glaucoma.

**Action**
Inhibition of carbonic anhydrase in the eye results in decreased secretion of aqueous humor. Inhibit renal carbonic anhydrase, resulting in self-limiting urinary excretion of sodium, potassium, bicarbonate, and water.

**Therapeutic Effects:** Lowering of intraocular pressure.

**Pharmacokinetics**

- **Absorption:** Well absorbed after oral administration.
- **Distribution:** Crosses the placenta.
- **Metabolism and Excretion:** 15–30% excreted unchanged in urine.
- **Half-life:** 14 hr.

**TIME/ACTION PROFILE (intraocular pressure)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>2–4 hr</td>
<td>6–8 hr</td>
<td>10–18 hr</td>
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</table>

**Contraindications/Precautions**
- **Contraindicated in:** Hypersensitivity or cross-reactivity with sulfonamides may occur; GI: Avoid during first trimester of pregnancy. Concerned use of oral and topical eye preparations; carbonic anhydrase inhibitors is not recommended.
- **Use Cautiously in:** Chronic respiratory disease; Electrolyte abnormalities; Renal or hepatic disease; Diabetes mellitus; OB, Lactation: Second or third trimester of pregnancy or lactation (safety not established).

**Adverse Reactions/Side Effects**

- **CNS:** Deafness, fatigue, weakness, dizziness, E N E D, transient neurotoxicity.
- **GI:** Nausea, vomiting, gastroenteritis, constipation, diarrhea.
- **GU:** Nephrolithiasis, renal calculi.
- **Derm:** Rash, Eruptions, photosensitivity, dermatitis.
- **Endo:** Hyperkalemia, hypocalcemia.
- **Hemat:** Anemia, leukopenia, thrombocytopenia, ecchymosis, bleeding.
- **Ophth:** Corneal edema, conjunctivitis, iritis, uveitis.
- **Otic:** Ototoxicity.
- **Resp:** Cough, dyspnea, respiratory depression.

**Interactions**

- **Drug-Drug:** May increase effect of other carbonic anhydrase inhibitors, aspirin, and lithium and lead to hypokalemia. May increase effect of amphetamines, quinidine, procainamide, cyclosporine, and possibly tricyclic antidepressants and local anesthetics.

**Route/Dosage**

**PO (Adults):** 50–100 mg 2–3 times daily.

**NURSING IMPLICATIONS**

- **Assessment:**
  - Assess for eye discomfort or decrease in visual acuity.
  - Observe for signs of hypokalemia (muscle weakness, malaise, fatigue, ECG changes, vomiting).
  - Assess for allergy to sulfonamides.
  - Lab Test Considerations: Evaluate serum electrolytes, CBC, and platelet counts initially and periodically during prolonged therapy. May cause ↑ potassium, bicarbonate, WBC, and Hgb. May cause ↓ serum chloride.
  - Use caution with concurrent use of potassium-sparing diuretics.
  - May cause ↑ in serum and urine glucose; monitor serum and urine glucose carefully in patients with diabetes.
  - May cause false positive results for urine protein and 17-hydroxy steroids.
  - May cause ↑ blood ammonia, bilirubin, urea, uric acid, creatinine, and calcium. May ↓ urine citrate.

**Potential Nursing Diagnoses**

- Disturbed sensory perception (visual) (Indications)

**Implementation**

- Encourage fluid intake of 2000–3000 mL/day, unless contraindicated, to prevent crystalluria and stone formation.
- A potassium supplement without chloride should be administered concurrently with carbonic anhydrase inhibitors.
- PO: Give with food to minimize GI irritation. Tablets may be crushed and mixed with fruit-flavored syrup to minimize bitter taste for patients with difficulty swallowing.
Patient/Family Teaching

- Instruct patient to take as directed. Take missed doses as soon as possible unless almost time for next dose. Do not double doses.
- Advise patient of the need for periodic ophthalmologic exams; loss of vision may be gradual and painless.
- Advise patient to report numbness or tingling of extremities, weakness, rash, sore throat, unusual bleeding or bruising, or fever to health care professional. If hematopoietic reactions, fever, rash, or renal problems occur, carbonic anhydrase inhibitor therapy should be discontinued.
- May occasionally cause dermatitis. Caution patient to avoid driving and other activities that require alertness until response to the drug is known.
- Caution patient to use sunscreen and wear protective clothing to prevent photosensitivity reactions.

Evaluation/Desired Outcomes

- Decrease in intraocular pressure when used for glaucoma. If therapy is not effective or patient is unable to tolerate one carbonic anhydrase inhibitor, using another may be effective and more tolerable.

Why was this drug prescribed for your patient?