zinc sulfate (zink-sul-fate)

**Classification**
Therapeutic: mineral and electrolyte replacements/supplements
Pharmacologic: trace metals

**Pregnancy Category C (parenteral)**

**Indications**
Replacement and supplementation therapy in patients who are at risk for zinc deficiency, including patients on long-term parenteral nutrition. **Unlabeled Use**—Management of impaired wound healing due to zinc deficiency.

**Action**
Serves as a cofactor for many enzymatic reactions. Required for normal growth and tissue repair, wound healing, and senses of taste and smell. **Therapeutic Effects**—Replacement in deficiency states.

**Pharmacokinetics**

- **Absorption:** Poorly absorbed from the GI tract (20–30%).
- **Distribution:** Widely distributed. Concentrates in muscle, bone, skin, kidney, liver, prostate, retina, pancreas, blood, and WBCs.
- **Metabolism and Excretion:** 90% excreted in feces, remainder lost in urine and sweat.
- **Half-life:** Unknown.

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

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<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tbody>
<tr>
<td>PO</td>
<td>unknown</td>
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<td>IV</td>
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**Contraindications/Precautions**

- Hypersensitivity or allergy to any components in formulation; Pregnancy or lactation (supplemental amounts > RDA for pregnant or lactating patients); Preparations containing alcohol should not be used in neonates.

**Use Cautiously in:**
Renal failure.

**Adverse Reactions/Side Effects**

- **GI:** gastric irritation (oral use only), nausea, vomiting.

**Interactions**

- **Drug-Drug:** Oral zinc may ↓ absorption of tetracyclines or fluoroquinolones.
- **Drug-Food:** Coffee, dairy products, and bran may ↓ absorption of orally administered zinc.

**Route/Dosage**

- **RDA**—15 mg. Doses expressed in mg of elemental zinc unless otherwise noted. Zinc sulfate contains 23% zinc.

- **Deficiency**
  - **PO (Adults):** Prevention of deficiency—15–19 mg/day; treatment of deficiency—must be individualized; based on degree of deficiency.
  - **IV Nutritional Supplementation—Metabolically Stable Patients**
    - **IV (Adults):** 2.5–4 mg/day; up to 12 mg/day in patients with excessive losses.
    - **IV (Infants and Children <5 yr):** 100 mcg/kg/day.
    - **IV (Infants up to 3 kg):** 300 mcg/kg/day.

**NURSING IMPLICATIONS**

- **Assessment**
  - Monitor progression of zinc deficiency symptoms (impaired wound healing, growth retardation, decreased sense of taste, decreased sense of smell) during therapy.
  - **Lab Test Considerations:** Serum zinc levels may not accurately reflect zinc deficiency.
  - **Long-term high-dose zinc therapy may cause ↓ serum copper concentrations.
  - **Monitor** serum alkaline phosphatase concentrations monthly; may ↑ with zinc therapy.
  - **Monitor** HDL concentrations monthly in patients on long-term high-dose zinc therapy. Serum concentrations may be ↓.

- **Potential Nursing Diagnoses**
Inadequate nutrition: less than body requirements (indications)
Implementation

- **PO:** Administer oral doses with food to decrease gastric irritation. Administration with caffeine, dairy products, or beer may impair absorption.

- **IV:** Zinc is often included as a trace mineral in total parenteral nutrition solution prepared by pharmacist.

Patient/Family Teaching

- Encourage patient to comply with diet recommendations of health care professional. Explain that the best source of vitamin is a well-balanced diet with foods from the four basic food groups. Foods high in zinc include seafood, organ meats, and whole grains.

- Patients self-medicating with vitamin supplements should be cautioned not to exceed RDA. The effectiveness of megadoses for treatment of various medical conditions is unproved and may cause side effects.

- Instruct patients receiving oral zinc to notify health care professional if severe nausea, vomiting, abdominal pain, or tarry stools occur.

- Emphasize the importance of follow-up exams to evaluate progress.

Evaluation/Desired Outcomes

- Improved wound healing.

- Improved senses of taste or smell. 6–8 wk of therapy may be required before full effects are seen.

Why was this drug prescribed for your patient?