CALCITONIN
(calcitonin (salmon))
(calcitonin (rDNA))
Calcimar, Caltine, Miacalcin

**Therapeutic Classifications:**
- Hypocalcemics
- Hormones

**Pregnancy Category:** C

**Indications**
- **IM, Subcut:** Treatment of Paget's disease of bone. Adjunctive therapy for hypercalcemia.
- **IM, Subcut, Intranasal:** Management of postmenopausal osteoporosis.

**Action**
- Inhibits osteoclastic bone resorption and promotes renal excretion of calcium.

**Therapeutic Effects:**
- Decreased rate of bone turnover.
- Lowering of serum calcium.

**Pharmacokinetics**
- **Absorption:** Completely absorbed from IM and subcut sites. Rapidly absorbed from nasal mucosa; absorption is 3% compared with parenteral administration.
- **Distribution:** Unknown.
- **Metabolism and Excretion:** Rapidly metabolized in kidneys, blood, and tissues.
- **Half-life:** 40–90 min.

**TIME/ACTION PROFILE**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM, subcut†</td>
<td>Unknown</td>
<td>2 hr</td>
<td>6–8 hr</td>
</tr>
<tr>
<td>Intranasal‡</td>
<td>rapid</td>
<td>31–39 min</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

†Effects on serum calcium, effects on serum alkaline phosphatase and urinary hydroxyproline in Paget's disease may require 6–24 mo of continuous treatment
‡Serum levels of administered calcitonin

**Contraindications/Precautions**
- **Contraindicated in:** Hypersensitivity to calcitonin, salmon protein or gelatin diluent (in some products), OR, Gestation: Use uncontrolled.
- Use Cautionally in: Pedi: Safety not established.

**Adverse Reactions/Side Effects**
- **CNS:** Headaches (nasal only).
- **EENT:** Rhinitis, epistaxis, nasal irritation (nasal only).
- **GI:** Nausea, vomiting (IM, subcut).
- **GU:** Urinary frequency (IM, subcut).
- **Derm:** Rash.
- **Local:** Injection site reactions.
- **MS:** Arthralgia, back pain.
- **Misc:** Allergic reactions including hemorrhage, facial flushing, swelling.

**Interactions**
- **Drug-Drug:** Previous bisphosphonate therapy, including alendronate, risedronate, etidronate, ibandronate, pamidronate, may ↓ response to calcitonin.
- **Route/Dosage**
  - **Postmenopausal osteoporosis**
    - **IM, Subcut (Adults):** 100 units every other day.
    - **Intranasal (Adults):** 1 spray (200 units) in alternating nostrils.
  - **Paget's disease**
    - **IM, Subcut (Adults):** 100 units/day initially, after titration, maintenance dose is usually 50 units/day or every other day.
  - **Hypercalcemia**
    - **IM, Subcut (Adults):** 4 units/kg q 12 hr; if adequate response not achieved, may ↑ dose after 1–2 days to 8 units/kg q 12 hr, and if necessary after 2 more days may be ↑ to 8 units/kg q 6 h.

**NURSING IMPLICATIONS**
- **Assessment**
  - Observe patient for signs of hypersensitivity (skin rash, fever, hives, anaphylaxis, serum sickness).
  - Keep epinephrine, antihistamines, and oxygen near by in the event of a reaction.
- **Hypercalcemia**
  - Monitor patient for signs of hypercalcemic crisis (nervousness, irritability, paresthesia, muscle twitching, tetanic spasms, seizures) during the first several doses of calcitonin.

- **Drug-Drug:** Previous bisphosphonate therapy (alendronate, risedronate, etidronate, ibandronate, pamidronate) may ↓ response to calcitonin.
calcitonin. Parenteral calcium, such as calcium gluconate, should be available in case of this event.

**Intranasal:**
- Assess nasal mucosa, septum, turbinate, and mucosal blood vessels periodically during therapy. Levels should normalize within a few months of initiation of therapy.
- Nasal hydroxyproline (24 hr) may be monitored periodically in patients with Paget's disease.

**Potential Nursing Diagnoses**

- Acute Pain (Indications)
- Risk for Injury (Indications) (Side Effects)

**Implementation**

- Do not confuse Fortical with Foradil.
- In patients with suspected sensitivity to calcitonin, skin test should be considered before starting therapy. Test dose is prepared in a dilution of 10 units/mL by withdrawing 0.05 mL in a tuberculin syringe and filling to 1 mL with 0.9% NaCl for injection. Mix well and discard 0.05 mL. Administer 0.1 mL intradermally on inner aspect of forearm and observe site for 15 min. More than mild erythema or wheal constitutes positive response.
- Store injection and unopened nasal spray bottle in refrigerator. Nasal spray bottle in use can be stored at room temperature.
- IM, Subcut: Inspect injection site for the appearance of redness, swelling, or pain. Rotate injection sites. Subcut is the preferred route. Use IM route if dose exceeds 2 mL in volume. Use multiple sites to minimize inflammatory reaction.

**Patient/Family Teaching**

- Advise patient in the proper method of self-injection and care and disposal of equipment.
- Advise patient to report signs of hypersensitivity reaction (flushing, hot or cold skin, heart palpitations, wheals, itching, hives) or allergic response promptly.
- Advise patient that flushing and warmth following injection are transient and usually last about 1 hr.
- Explain that nausea following injection tends to decrease even with continued therapy.
- Advise patient to follow low-calcium diet if recommended by health-care professional. Women with postmenopausal osteoporosis should adhere to a diet high in calcium and vitamin D.
- Osteoporosis: Advise patients receiving calcium for the treatment of osteoporosis that exercise has been found to arrest and reverse bone loss. The patient should discuss any exercise limitations with health-care professional before beginning program.
- Intranasal: Instruct patient on correct use of nasal spray. Demonstrate procedure for use. Before first use, prime pump by holding upright and depressing white side arms down toward bottle 5 times until a full spray is emitted. Following activation, place nozzle firmly in nostril with head in an upright position and depress the pump toward the bottle. The pump should NOT be primed before each daily use. Discard bottle 30 days after first use.
- Advise patient to notify health-care professional if significant nasal irritation occurs.

**Evaluation/Desired Outcomes**

- Lowered serum calcium levels.
- Decreased bone pain.

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**Patient/Family Teaching**

- Advise patient to take calcitonin as directed. If dose is missed and medication is scheduled at twice a day, take only if remembered that day. If scheduled for every other day, take when remembered and restart alternate-day schedule. If taking 1 dose 3 times weekly (Mon, Wed, Fri), take missed dose the next day and set each injection back 1 day, resume regular schedule the following week. Do not double doses.

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