

Calcium gluconate is a mineral supplement and medication used to treat or prevent calcium deficiencies. It is commonly administered intravenously in emergencies like hypocalcemia, hyperkalemia, and calcium channel blocker overdose.

🧪 Chemical Composition

- **Active Ingredient:** *Calcium gluconate*
- **Molecular Formula:** $C_{12}H_{22}CaO_{14}$
- **Drug Class:** Calcium salt
- **Formulations:**
 - **Injectable solution:** 10% (100 mg/mL)
 - **Tablets:** 500 mg, 650 mg
 - **Capsules:** 500 mg
 - **Oral powder or syrup** (less common)

💊 Dosage & Administration

- **Route:** Intravenous (IV), oral
- **Typical Adult Dosage:**
 - *IV (10% solution):* 1-2 g (10-20 mL) slowly over 5-10 minutes for acute hypocalcemia
 - *Oral (tablet):* 500-1000 mg elemental calcium per day, divided every 8-12 hours
- **Pediatric Dosage:** Weight-based; used under medical supervision
- **Administration Tips:**
 - IV infusion must be slow to avoid cardiac complications
 - Oral forms should be taken 1-2 hours after meals

🌹 Medical Uses

- **Primary Indications:**
 - *Hypocalcemia* (low blood calcium)
 - *Hyperkalemia* (high potassium) as a membrane stabilizer
 - *Magnesium sulfate overdose*
 - *Calcium channel blocker toxicity*
 - *Osteoporosis* and *osteomalacia* (as a supplement)
- **Mechanism of Action:**
 - Replenishes calcium ions, essential for muscle contraction, nerve function, and blood clotting

⚠ Side Effects

Common:

- Injection site pain or irritation
- Constipation (oral use)
- Nausea

Serious:

- Arrhythmias (especially with rapid IV infusion)
- Hypercalcemia (confusion, fatigue, kidney stones)
- Tissue necrosis (if IV extravasation occurs)
- Hypotension or bradycardia (with IV use)

☈ Risks & Precautions

- **Contraindications:**
 - Hypercalcemia
 - Severe ventricular fibrillation
 - Patients on digoxin (risk of arrhythmia)
- **Pregnancy & Breastfeeding:**
 - Generally considered safe; consult a physician
- **Drug Interactions:**
 - May interact with digoxin, tetracyclines, bisphosphonates, and certain diuretics
- **Monitoring:**
 - Serum calcium levels, ECG, and renal function should be monitored during IV therapy

☺ Patient Feedback & Complaints

Positive Feedback:

- Effective in managing acute calcium deficiencies
- Rapid symptom relief in emergencies
- Oral forms well tolerated for long-term supplementation

Common Complaints:

- Pain or burning during IV administration
- Constipation with oral tablets
- Risk of overdose if not monitored

📊 Summary Table

Category	Details
Drug Name	Calcium Gluconate
Active Ingredient	Calcium gluconate
Use	Hypocalcemia, hyperkalemia, magnesium toxicity, calcium supplementation
Dosage	1-2 g IV (10%); 500-1000 mg orally daily

Common Side Effects	Injection site pain, constipation, nausea
Serious Risks	Arrhythmia, hypercalcemia, tissue necrosis
Patient Feedback	Effective; IV discomfort, constipation, requires monitoring
Contraindications	Hypercalcemia, digoxin use, severe heart conditions

Sources: [DrugBank](<https://go.drugbank.com/drugs/DB11126>),
[RxList](https://www.rxlist.com/calcium_gluconate/generic-drug.htm),
[Medscape](<https://reference.medscape.com/drug/calcium-gluconate-344434>)
