

Directions for Use

B. BRAUN MELSUNGEN AG 34209 MELSUNGEN, GERMANY

Calcium Gluconate 10 % B. Braun

Solution for Injection

1 NAME OF THE MEDICINAL PRODUCT

Calcium Gluconate 10 % B. Braun solution for injection

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

1 ml contains 94 mg calcium gluconate for injection as active ingredient equivalent to 0.21 mmol calcium.

10 ml contain 940 mg calcium gluconate for injection as active ingredient, equivalent to 2.10 mmol calcium.

Excipients: The product also contains an amount of the excipient calcium D-saccharate tetrahydrate equivalent to 0.02 mmol calcium per ml (or 0.15 mmol calcium per 10 ml).

Total calcium content: 0.23 mmol per ml (2.25 mmol per 10 ml)

For the full list of excipients, see section 6.1.

3 PHARMACEUTICAL FORM

Solution for injection

Clear, colourless to light brown aqueous solution, practically free from particles

Theoretical osmolarity: 660 mosm/l

pH: 5.5 – 7.5

4 CLINICAL PARTICULARS

4.1 Therapeutic indications

Treatment of acute symptomatic hypocalcaemia

4.2 Posology and method of administration

The normal concentration of calcium in plasma is within the range of 2.25–2.75 mmol or 4.5–5.5 mEq per litre.

Treatment should be aimed at restoring this level. During therapy, serum calcium levels should be monitored closely.

Posology

Adults:

The usual initial dose in adults is 10 ml of Calcium Gluconate 10% B. Braun, corresponding to 2.26 mmol or 4.52 mEq of calcium.

If necessary, the dose may be repeated, depending on the patient's clinical condition. Subsequent doses should be adjusted according to the actual serum calcium level.

Children and adolescents (< 18 years):

The dose and the route of administration depend on the degree of hypocalcaemia and the nature and severity of the symptoms. In the case of mild neuromuscular symptoms oral calcium administration should be preferred.

The following table gives usual initial dosage values for guidance:

Age	Body wt. (kg)	ml	Equiv. to mmol (mEq) calcium
3 mo.	5.5	2-5	0.45-1.13 (0.9-2.26)
6 mo.	7.5	2-5	0.45-1.13 (0.9-2.26)
1 yr.	10	2-5	0.45-1.13 (0.9-2.26)
3 yr.	14	5-10	1.13-2.26 (2.26-4.52)
7.5 yr.	24	5-10	1.13-2.26 (2.26-4.52)
12 yr.	38	5-10	1.13-2.26 (2.26-4.52)
> 12 yr.	> 38		As for adults

This corresponds approximately to:

- 0.4–1 ml/kg body weight (~ 0.09–0.23 mmol [0.18–0.45 mEq] of calcium per kg body weight) for children up to 3 years.
- 0.2–0.5 ml/kg body weight (~0.05–0.1 mmol [0.1–0.2 mEq] of calcium per kg body weight) for children from 4 to 12 years.

For patients above 12 years of age the adult dosages should be applied. In cases of severe symptoms of hypocalcaemia, e.g. cardiac symptoms, higher initial doses (up to 2 ml per kg body weight, ~0.45 mmol [0.9 mEq] calcium per kg body weight) may be necessary for a quick restoration of a normal serum calcium level.

Also, if necessary, the dose may be repeated, depending on the patient's clinical condition. Subsequent doses should be adjusted according to the actual serum calcium level. IV therapy should be followed by oral administration if indicated, e.g. in cases of calciferol deficiency.

Elderly patients:

Although there is no evidence that tolerance of calcium gluconate injection is directly affected by advanced age, factors that may sometimes be associated with ageing, such as impaired renal function and poor diet, may indirectly affect and may require a reduction in dosage.

Method of administration

The patient should be in the lying position and should be closely observed during injection. Monitoring should include heart rate or ECG.

Adults:

Intravenous use or intramuscular use.

Because of the risk of local irritation, deep intramuscular injections should only be performed if slow intravenous injection is not possible. Care should be taken to administer the intramuscular injections sufficiently deep intramuscularly, preferably into the gluteal region (see sections 4.4 and 4.8).

In the case of adipose patients a longer needle will have to be chosen for safe positioning of the injection into the muscle and not into the adipose tissues.

If repeated injections are necessary, the injection site should be changed every time.

The intravenous administration rate should not exceed 2 ml (0.45 mmol of calcium) per minute.

Paediatric patients (< 18 years):

Only slow intravenous injection or intravenous infusion (both after dilution), in order to achieve sufficiently low administration rates and to avoid irritation/necrosis in case of accidental extravasation.

The intravenous administration rate should not exceed 5 ml of a 1:10 dilution per minute (see section 6.6) of Calcium Gluconate 10% B. Braun in children and adolescents.

Intramuscular injections should not be performed in children.

4.3 Contraindications

Calcium Gluconate 10 % B. Braun must not be administered in the following conditions:

- Hypersensitivity to calcium gluconate and to the excipient,
- elevated calcium level in blood (hypercalcaemia), e.g. in patients with hyperparathyroidism, hypervitaminosis D, decalcifying malignancies, renal insufficiency, immobilisation osteoporosis, sarcoidosis, milk-alkali syndrome,
- increased calcium excretion in urine (hypercalciuria),
- intoxication with cardiac glycosides,
- therapy with cardiac glycosides.

The only exception may be that IV calcium administration is imperative for treatment of severe hypocalcaemia symptoms putting the patient at immediate vital risk, if safer therapeutic alternatives are not available and calcium administration via the oral route is not possible

4.4 Special warnings and precautions for use

Special warnings

In the exceptional case of intravenous administration of calcium gluconate to patients receiving cardiac glycosides, adequate cardiac monitoring is mandatory and emergency treatment of cardiac complications such as serious arrhythmias must be available.

Calcium salts should only be used with caution and after careful establishment of the indication in patients with nephrocalcinosis, heart diseases, sarcoidosis (Boeck's disease), in patients receiving epinephrine (see section 4.5), or in the elderly.

Renal impairment may be associated with hypercalcaemia and secondary hyperparathyroidism. Therefore, in patients with renal impairment, parenteral calcium should be administered only after careful assessment of the indication and the calcium-phosphate balance should be monitored.

Precautions for use

Solutions containing calcium should be administered slowly to minimise peripheral vasodilation and cardiac depression.

Intravenous injections should be accompanied by heart rate or ECG control because bradycardia with vasodilatation or arrhythmia can occur when calcium is administered too quickly.

In paediatric patients, Calcium Gluconate 10 % B. Braun should not be injected intramuscularly but only slowly intravenously.

Patients receiving calcium salts should be monitored carefully to ensure maintenance of correct calcium balance without tissue deposition.

Plasma levels and urinary excretion of calcium should be monitored when high-dose parenteral calcium is administered.

Calcium is insoluble in adipose tissue and may therefore cause infiltration and subsequent abscess formation, tissue indurations and necrosis if accidentally injected into the adipose tissue.

After perivascular or superficial intramuscular injection local irritation, possibly followed by skin ablation or tissue necrosis, may occur (see section 4.8). Extravasation must be avoided; the injection site should be monitored carefully.

High Vitamin D intake should be avoided.

Calcium is not suitable in the adipose tissue and can lead there to infiltration with subsequent abscess formation. Calcium gluconate should only be slowly injected intravenously into children and never intramuscularly. In the case of renal impairment with reduced calcium excretion, the serum calcium level must be monitored.

4.5 Interaction with other medicinal products and other forms of interaction

Cardiac glycosides

The effects of digoxin and other cardiac glycosides may be potentiated by calcium, which may result in serious toxicity. Therefore, intravenous administration of calcium preparations to patients under therapy with cardiac glycosides is contraindicated. The only exception may be that intravenous calcium administration is imperative for treatment of severe hypocalcaemia symptoms putting the patient at immediate vital risk, if safer therapeutic alternatives are not available and calcium administration via the oral route is not possible (see sections 4.3 and 4.4).

Epinephrine

Co-administration of calcium and epinephrine may lead to cardiac arrhythmia.

Magnesium

Calcium and magnesium mutually antagonise their effects.

Calcium antagonists

Calcium may antagonise the effect of calcium antagonists (calcium channel blockers).

Thiazide diuretics

Combination with thiazide diuretics may induce hypercalcaemia as these medicinal products reduce renal calcium excretion.

The medicinal product should not be mixed with any other drugs, unless compatibility has been satisfactorily demonstrated.

Calcium salts can form complexes with many drugs and this may result in a precipitate.

Calcium salts are incompatible with oxidizing agents, citrates, soluble carbonates, bicarbonates, oxalates, phosphates, tartrates and sulphates.

Physical incompatibility has also been reported with amphotericin, cephalothin sodium, cephazolin sodium, cephamandole nafate, novobiocin sodium, dobutamine hydrochloride, prochlorperazine and tetracyclines.

Calcium salts reduce the absorption of a number of other drugs such as bisphosphonates, fluoride, some fluoroquinolones, and tetracyclines; doses should be separated by at least 3 hours.

4.6 Fertility, pregnancy and lactation

Pregnancy

Calcium passes across the placental barrier and its concentration in foetal blood is higher than in maternal blood.

Calcium Gluconate 10 % B. Braun should not be used during pregnancy unless clearly necessary. The administered dose should be carefully calculated, and the serum calcium level regularly evaluated in order to avoid hypercalcaemia, which may be deleterious for the foetus.

Breast-feeding

Calcium is excreted in breast milk This should be borne in mind when administering calcium to women who are breast-feeding their infants. A decision must be made whether to discontinue breast-feeding or to discontinue/abstain from Calcium Gluconate 10 % B. Braun therapy taking into account the benefit of breast feeding for the child and the benefit of therapy for the woman.

Fertility

No data available.

4.7 Effects on ability to drive and use machines

Not relevant.

4.8 Undesirable effects

Cardiovascular and other systemic undesirable effects are likely to occur as symptoms of acute hypercalcaemia resulting from intravenous overdose or too rapid intravenous injection. Their occurrence and frequency is directly related to the administration rate and the administered dose. Under the conditions of proper administration, they are rare (< 1:1000).

Cardiac and vascular disorders

Hypotension, bradycardia, cardiac arrhythmia, vasodilatation, vasomotor collapse (possibly fatal), flushing, mainly after too rapid injection.

B | BRAUN

Gastro-intestinal disorders

Nausea, vomiting

General disorders

Heat sensations, sweating

Administration site conditions**Common (< 1:10, ≥ 1:100):**

Intramuscular injection may be accompanied by pain sensations or erythema.

Adverse reactions only occurring with improper administration technique:

If intramuscular injection is not made at adequate depth, infiltration into the adipose tissue may occur with subsequent abscess formation, tissue induration, and necrosis.

Soft tissue calcification, possibly followed by skin ablation and necrosis, due to extravasation, has been reported.

Reddening of skin, burning sensation or pain during intravenous injection may indicate accidental perivascular injection, which may lead to tissue necrosis.

Note:

Patients should inform their doctor or pharmacist if they notice any side effect not mentioned in this leaflet.

4.9 Overdose**Symptoms**

Symptoms of hypercalcaemia may include: anorexia, nausea, vomiting, constipation, abdominal pain, polyuria, polydipsia, dehydration, muscle weakness, renal calcification, drowsiness, confusion, hypertension and, in severe cases, cardiac arrhythmia up to cardiac arrest and coma.

If intravenous injection is too rapid, symptoms of hypercalcaemia may occur as well as a chalky taste, hot flushes and hypotension.

Emergency treatment, antidotes

Treatment should be aimed at lowering the elevated plasma calcium concentration.

Initial management should include rehydration and, in severe hypercalcaemia, it may be necessary to administer isotonic sodium chloride solution by intravenous infusion to expand the extracellular fluid. Calcitonin may be given to lower the elevated serum calcium concentration. Furosemide may be administered to increase calcium excretion but thiazide diuretics should be avoided as they may increase renal absorption of calcium.

Haemodialysis or peritoneal dialysis may be considered where other measures have failed and where the patient remains acutely symptomatic. Serum electrolytes should be carefully monitored throughout treatment of overdose.

5 PHARMACOLOGICAL PROPERTIES**5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: Solutions affecting the electrolyte balance, electrolytes.

ATC-code: B05B B01.

Calcium is the most abundant mineral in the human organism (approx. 1.5 % of the entire body weight). More than 99 % of the body's total calcium are located in bones and teeth, approx. 1 % are dissolved in intra- and extracellular fluid.

Calcium is necessary for the functional integrity of nerves and muscles. It is essential for the muscle contraction, cardiac function and blood coagulation.

The physiological level of the plasma calcium concentration is maintained at 2.25 –2.75 mmol/l. As about 50 % of the plasma calcium is bound to albumin, total plasma calcium is coupled to the plasma protein concentration. The concentration of ionised calcium is between 1.23 and 1.43 mmol/l, regulated by calcitonin and parathormone.

Hypocalcaemia (total calcium below 2.5 mmol/l or ionised calcium below 1.23 mmol/l, respectively) may be caused by renal failure, vitamin D deficiency, magnesium deficiency, massive blood transfusion, osteoblastic malignant tumours, hypoparathyroidism, or intoxication with phosphates, oxalates, fluorides, strontium or radium.

Hypocalcaemia may be accompanied by the following symptoms: increased neuromuscular excitability up to tetany, paraesthesiae, carpal spasm, spasms of smooth muscles e.g. in the form of intestinal colic, muscle weakness, confusion, cerebral convulsive seizures and cardiac symptoms like prolonged QT interval, arrhythmia and even acute myocardial failure.

The therapeutic effect of parenteral calcium substitution is normalisation of pathologically low serum calcium levels and thus relief of the symptoms of hypocalcaemia.

5.2 Pharmacokinetic properties**Distribution**

After injection the administered calcium shows the same distribution behaviour as the endogenous calcium. About 50% of the total plasma calcium is in the physiologically active ionised form, about 50% is bound to proteins, mainly albumin, and 5% is complexed with anions.

Biotransformation

After injection the administered calcium adds to the intravascular calcium pool and is handled by the organism in the same manner as the endogenous calcium.

Elimination

Excretion of calcium occurs in the urine although a large proportion undergoes renal tubular reabsorption.

5.3 Preclinical safety data

Non-clinical data reveal no special hazard for humans based on conventional studies of safety pharmacology, repeated dose toxicity, genotoxicity, carcinogenic potential, toxicity to reproduction and development.

6 PHARMACEUTICAL PARTICULARS**6.1 List of excipients:**

Calcium-D-saccharate 4 H₂O,

Water for injections

6.2 Shelf life

Shelf Life as packaged for sale

3 years

Shelf life after first opening the container

For single dose use only. Any unused solution should be discarded immediately after initial use.

Shelf life after dilution according to directions

When diluted to 10 mg/ml, according to directions, with the recommended infusion fluids (i.e. sodium chloride 9 mg/ml (0.9 %) solution for injection or glucose 50 mg/ml (5 %) solution for injection) physical in-use stability has been demonstrated for 48 hours, when stored at room temperature.

From a microbiological point of view, the diluted product should be used immediately. If not used immediately, in-use storage times and conditions prior to use are the responsibility of the user and would normally not be longer than 24 hours at 2 to 8 °C, unless dilution has taken place in controlled and validated aseptic conditions.

6.3 Special precautions for storage

Do not store above 30 °C

For storage conditions of the diluted medicinal product, see section 6.2.

6.4 Nature and contents of container

10 ml LDPE ampoules

Pack size: 20 ampoules.

Not all pack sizes may be marketed.

6.5 Special precautions for disposal and other handling**Disposal**

No special requirements for disposal.

Handling

The product is intended for single use only. Discard any unused solution.

The medicinal product should be visually inspected for particulate matter, discolouration and the integrity of the container prior to use.

The solution should only be used if it is clear, colourless to light brown aqueous solution, practically free from particles and the container is undamaged.

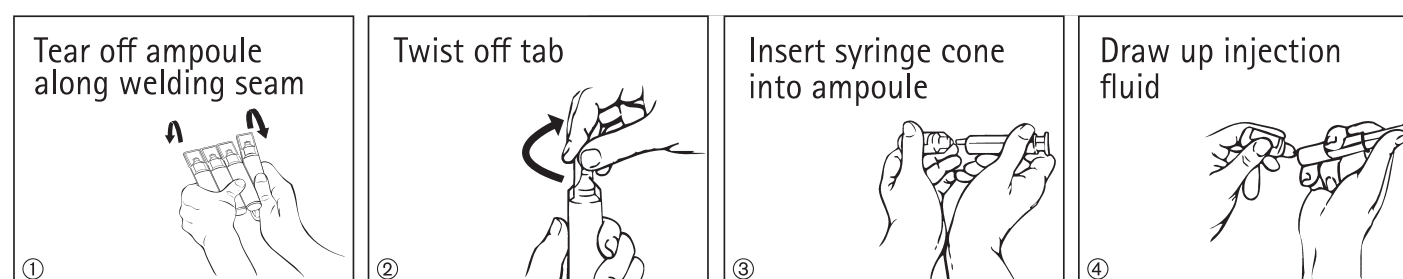
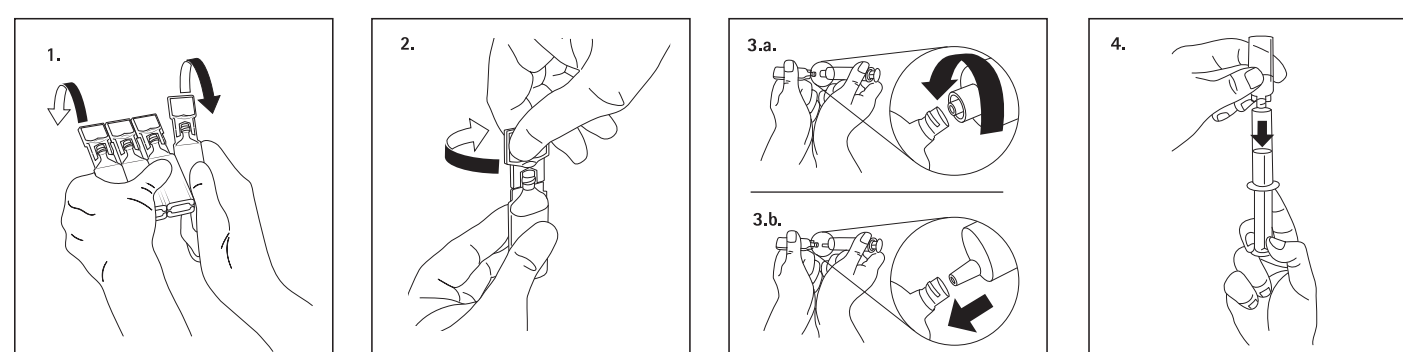
Dilution

For intravenous infusion, Calcium Gluconate 10 % B. Braun may be diluted 1:10 to a concentration of 10 mg/ml with the following two infusion fluids: sodium chloride 9 mg/ml (0.9%) solution for injection or glucose 50 mg/ml (5%) solution for injection. When diluted with these recommended infusion fluids, the resulting solutions are intended for immediate single use. Dilution should be performed under controlled and validated aseptic conditions. After mixing, the container should be gently agitated to ensure homogeneity.

Before using this product together with other solutions via a Y connector or bypass set, the compatibility of these fluids should be checked.

7 DATE OF REVISION OF THE TEXT

May 2019

Mini-Plasco® Handling**Mini-Plasco® Connect Handling****B | BRAUN**

Product Registration Holder:
B. Braun Medical Industries S/B
11900 Bayan Lepas, Penang,
Malaysia

Manufacturer:
B. Braun Melsungen AG
Carl-Braun-Strasse 1,
34212 Melsungen, Germany.

Production site:
B. Braun Melsungen AG
Mistelweg 2-6, 12357 Berlin,
Germany