

Policy code	DTP_CAG_0223			
Date	February, 2023			
Purpose	To ensure a consistent procedural approach to calcium gluconate administration.			
Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.			
Health care setting	Pre-hospital assessment and treatment.			
Population	Applies to all ages unless stated otherwise.			
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Author	Clinical Quality & Patient Safety Unit, QAS			
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# Calcium gluconate

#### Drug class<sup>[1]</sup>

Electrolyte

## Pharmacology

Calcium plays an integral role in the muscular and neural systems. It is involved in skeletal muscle contraction, excitation coupling in cardiac and smooth muscle and acts as an intracellular second messenger. These effects combine to exert a positive inotropic effect in the post cardiac arrest patient. It additionally has a role in cardiac membrane stabilisation in hyperkalaemia and as an effective treatment of pain and systemic symptoms associated with hydroflouric acid exposure.<sup>[1,2]</sup>

## Metabolism

Most of the parenterally administered calcium filtered by the renal glomeruli is reabsorbed; the remainder is excreted in urine.<sup>[1]</sup>

#### Indications<sup>[1-8]</sup>

- Suspected hyperkalaemic cardiac arrest
- **Severe hyperkalaemia** (with haemodynamic compromise AND/OR significant cardiac rhythm disturbance)
- Verapamil AND/OR diltiazem toxicity
- **Hypotension** associated with a **magnesium infusion** (that fails to respond to IV fluid therapy)
- Hydrofluoric acid inhalation
- Following pre-hospital blood product transfusion
   (adults every unit/paediatrics every 10 mL/kg OR unit)

#### Contraindications

- Allergy AND/OR Adverse Drug Reaction
- Digoxin (digitalis) overdose

#### recautions

Respiratory acidosis

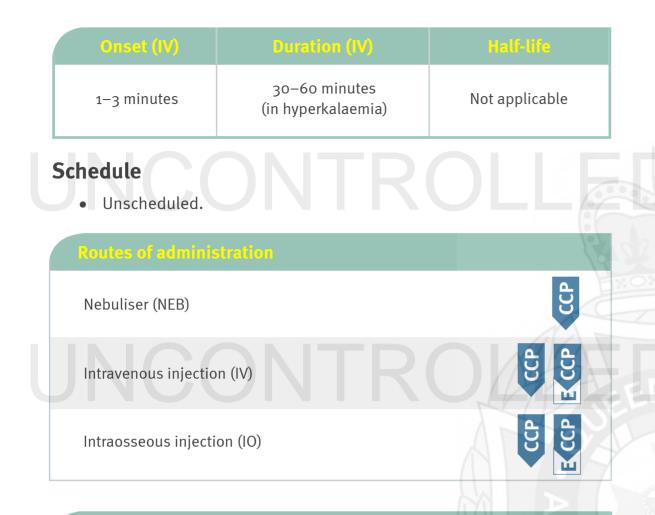
- Syncope
- Hypotension
- Bradycardia
- Cardiac dysrhythmias
- Cardiac arrest

Presentation

- Vial, 2.2 mmol/10 mL calcium gluconate monohydrate 10%
- Injection (pre-filled syringe with graduated markings),
   4.4 mmol/25 mL calcium gluconate 8%

February, 2023

## **Calcium gluconate**



#### Special notes

- Ambulance officers must only administer medications for the listed indications and dosing range. Any consideration for treatment outside the listed scope of practice requires mandatory approval via the *QAS Clinical Consultation and Advice Line*.
- The solution may precipitate, check all vials and discard if cloudy or contains particles.
- Adverse events may be prevented/minimised by reducing the rate of medication delivery.
- The routine administration of calcium for the treatment of vasoselective dihydropyridine channel blockers (e.g. amiodipine, nifedipine, felodipine etc) is not recommended.<sup>[4]</sup>

### Special not

- Calcium gluconate is highly irritant, extravasation may cause significant tissue damage. Monitor the injection site closely.<sup>[1-3]</sup>
- All cannulae and IV lines must be flushed thoroughly with sodium chloride 0.9% following each medication administration.
- All parenteral medications must be prepared in an aseptic manner. The rubber stopper of all vials must be disinfected with an appropriate antimicrobial swab and allowed to dry prior to piercing.

# Adult dosages<sup>[1-8]</sup>



2.2 mmolRepeat once at 10 minutes if required.

Severe hyperkalaemia (with haemodynamic compromise AND/OR significant cardiac rhythm disturbance)

(that fails to respond to IV fluid therapy)



CCP

2.2 mmolSlow push over 2–3 minutes.Repeat once at 10 minutes if required.

#### amil AND/OR diltiazom toxicity

# IV/IO 6.6 mmol

Slow push over 2–3 minutes. Repeat once at **10 minutes** if required.

# Adult dosages (cont.)

	NEB	2 mL of 2.5% concentration Repeat PRN. No maximum dose.	E	IV/IO	<b>o.1 mmol/kg</b> Single dose not to exceed 2.2 mmol. Repeat once at <b>10 minutes</b> if required.
		<b>Nebulised solution preparation:</b> Mix 2.5 mL of calcium gluconate 10% with 7.5 mL of sodium chloride 0.9% in a 10 mL syringe to achieve a final concentration of calcium gluconate 2.5%. Ensure all syringes are appropriately labelled.		OR significa	alaemia (with haemodynamic compromise ant cardiac rhythm disturbance) OR dilliazem toxicity
llow	ing pre-h	espital blood product transfusion (every unit)	- Hypo admi	tension a nistration	ssociated with a magnesium infusion (that fails to respond to IV fluid therapy)
	IV/IO	<ul> <li>2.2 mmol</li> <li>Slow push over 2–3 minutes.</li> <li>Repeat with every unit transfused.</li> <li>Total maximum dose 6.6 mmol.</li> </ul>	SL	IV/IO	<b>o.1 mmol/kg</b> Single dose not to exceed 2.2 mmol. Slow push over 2–3 minutes. Repeat once at <b>10 minutes</b> if required.
		DNTROLESE	Followin (every 10	<mark>g pre-hos</mark> mL/kg OR u	pital blood product transfusion
			E S	IV/IO	o.1 mmol/kg Single dose not to exceed 2.2 mmol. Slow push over 2–3 minutes. Repeat with every unit transfused. Total maximum dose 6.6 mmol.

Paediatric dosages<sup>[1-5,7]</sup>