Clinical Practice Guidelines:
Toxicology and toxinology/Calcium channel blocker

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Date	July, 2022
Purpose	To ensure a consistent approach to the management of calcium channel blocker poisoning.
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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Calcium channel blocker

July, 2022

Calcium channel blockers (CCBs) are commonly prescribed medications used in the treatment of hypertension, angina pectoris and cardiac arrhythmia.[1] In overdose they can cause severe cardiovascular toxicity.

Examples:

- Verapamil
- Diltiazem
- Amlodipine
- Nifedipine
- Felodipine
- Lercanidipine

Most CCBs in therapeutic doses act to decrease blood pressure through vasodilation. In overdose this can lead to hypotension and vasodilatory shock.

Verapamil and diltiazem are particularly toxic as they also act on calcium channels in the heart to slow the heart rate and decrease myocardial contractility. In overdose they can cause bradycardia and cardiogenic shock.

Many CCBs are available as slow release preparations. Therefore, there can be a delay of many hours from time of ingestion before the onset of toxicity.

Calcium can ameliorate toxicity and is part of the treatment approach to severe poisoning.[2]

Clinical features

Cardiovascular effects

- Bradycardia
- Heart block
- Hypotension
- Cardiogenic shock

Systemic effects

- Seizures
- Coma
- Hyperglycaemia
- Metabolic acidosis

Risk assessment

- CCB toxicity is potentially life-threatening, particularly if verapamil or diltiazem is taken which are more cardio selective.
- Older persons and those with underlying cardiovascular disease are more at risk of severe toxicity.
- Co-ingestion of other cardiac medication such as ACE inhibitors, beta blockers or digoxin can cause severe toxicity.[3,4]

CPG: Clinician safety
CPG: Standard cares

Ongoing imminent risk of harm?

Y

Consider:

- Verbal de-escalation
- QPS assistance
- Physical restraint
- EEA

Manage as per:

CPG: Sedation – Acute behavioural disturbance

N

Perform:

- 12-Lead ECG
- BGL

Consider:

- Oxygen
- IV Access

Bradycardia or hypotension?

Y

Consider:[3,4]

- IV fluid
- Calcium gluconate (verapamil and/or diltiazem toxicity only)
- Atropine
- Adrenaline
- Transcutaneous pacing

N

Transport to hospital
Pre-notify as appropriate

Note: *Clinicians must only perform procedures for which they have received specific training and authorisation bv the QAS.*