

# Dihydropyridine Calcium Channel Blockers (CCBs)

Overdose is associated with vasoplegia and cardiovascular collapse and is often delayed with modified-release preparations.

## Toxicity / Risk Assessment

**Dihydropyridine CCBs include:** amlodipine, nifedipine, felodipine, lercanidipine, nimodipine

- Cause ↑ degree of vasodilatation, but less myocardial depression/conduction delays compared to verapamil or diltiazem
- Combination with ACEI/ARB or massive ingestions can produce serious CVS toxicity with profound treatment-resistant vasoplegia

**Standard release:** symptoms occur within 1-2 hours

**Modified-release:** symptoms may be delayed up to 12 hrs

**↑ risk:** elderly and children/underlying cardiac disease/  
co-ingestion of other cardiac medications (beta-blockers  
ACEI & ARB, digoxin)

### Clinical features:

- CVS: vasoplegia, ↓BP; may progress to refractory shock and death
- Metabolic: ↑glucose, lactic acidosis
- GI: nausea, vomiting, ileus

## Management

CCB overdose is potentially life-threatening – **consult a Clinical Toxicologist early**

**Decontamination: Activated Charcoal (AC) 50 g:** Alert patient < 2 hours post OD of immediate release preparation, and < 6 hours post OD of modified release preparation. Intubated patients (regardless of time post ingestion) via NG/orogastric tube after confirmation of correct placement

Whole bowel irrigation (WBI) may be appropriate in selected cases (*Discuss with Clinical Toxicologist*)

**Hypotension** (mainly due to profound vasoplegia)

**Fluid:** initially load with 10-20 mL/kg IV crystalloid, further IV fluids may lead to pulmonary oedema

**Catecholamine infusion:** Choice of agent guided by echocardiogram

- Noradrenaline is the vasopressor of choice
- Vasopressin: add vasopressin if hypotension despite noradrenaline

**Calcium:** 30 mL Ca<sup>2+</sup> gluconate (3 grams, 6.6 mmol) bolus IV over 5-15 minutes

- Repeat boluses x 3 in 1<sup>st</sup> 60 minutes; infusion to maintain ionized Ca<sup>2+</sup> concentration 1.5 - 2.0 mmol/L

**High-Dose Insulin Euglycaemia Therapy (HIET): (please discuss with toxicologist)**

- HIET functions primarily as an inotrope, rather than a vasopressor. *HIET may worsen vasoplegia.*

### Treatment of Refractory Hypotension

If vasoplegic shock persists despite noradrenaline & vasopressin, discuss with clinical toxicologist regarding potential benefit of hydroxocobalamin, methylene blue and ECMO

**Disposition:** - Discharge pending mental health assessment if clinically well with normal ECG 6 hours post ingestion of immediate release and 12 hours post ingestion of modified release preparations