Cardiovascular collapse which may be delayed is main issue with verapamil or diltiazem, other CCBs not associated with severe toxicity.

Toxic mechanism

Block opening of L-type Ca^{2+} channels → vascular dilatation, slowing of cardiac conduction and reduced cardiac contraction force. Also inhibit insulin release.

Toxicokinetics

Rapid abs with peak levels @ 1-2hr with std preps and 6-12hr for XR preps. Though these times may be ~6hr & ≥24hr in OD. High Vd, protein bound. 1st pass hepatic metabolism. Both verapamil and diltiazem have active metabolites.

Clinical features

CVS: ↓HR, 1st degree block, ↓BP are early signs. Progression to refractory shock & death. Myocardial/mesenteric ischaemia or stroke may occur.
CNS: coma & seizures are rare.
Metabolic: ↑BSL, metabolic/lactic acidosis occur in severe OD.

Investigations

Screening: ECG, paracetamol, BSL
Specific bloods: CMP (serial Ca^{2+}), UEC, ABG+lactate, CK/Trop
Other: serial ECGs, ICU monitoring of cardiac output & SVR & PAWP.

Risk assessment

Life-threatening toxicity likely with OD of >10 tablets of verapamil or diltiazem XR.
Symptoms may be delayed considerably by XR prep.
Co-ingestion of BB or digoxin, elderly, co-morbidities all ↑↑risk of serious toxicity.

Management

Resus & Supportive Care:

- Time critical emergency: refractory ↓BP, cardiac dysrhythmia & arrest may occur.
- O_2. **Early** intubation for life-threatening toxicity (if sBP<90mmHg after fluid bolus)
- Invasive monitoring advised incl. arterial line for BP measurement.
- Fluids for ↓BP initially – 10-20ml/kg Normal saline boluses
- Early use of antidotes (below)
- Catecholamine infusion: **dopamine**, **adrenaline** or **NA** for refractory shock
- Cardiac pacing, ECMO & inta-aortic balloon pump may be req in sev refractory cases.

Decontamination: PO charcoal if <1hr (std) or <4hr (XR prep). NG to all tubed patients. WBI if co-operative & without established toxicity if <4h post OD>10tabs. Controversial if tubed.
Antidote (see Antidotes):

- **Atropine** 600mcg IV rpt up to 3mg for ↓HR
- **Calcium gluconate 10%** 60ml or **calcium chloride 10%** 20ml IV over 15min then start infusion to keep Ca^{2+}>2.0mmol/L
- **High dose insulin-dextrose** and possibly **IV lipid emulsion**
- **Sodium bicarbonate** for severe metabolic acidosis.

Disposition

If asymptomatic with normal ECG at 4h (16h if XR) can be d/c else admit HDU/ICU.