

Significant TCA OD produces rapid onset of cardiovascular and neurological toxicity. Sodium Bicarbonate (NaHCO_3) is the antidote and is often life-saving

Toxicity / Risk Assessment

Clinical toxicity is dose dependent:

5-10 mg/kg – mild toxicity (worse in children)

>10 mg/kg – moderate toxicity

>20 mg/kg – severe toxicity

One tablet in a child may produce significant toxicity

Onset of effects in significant OD occurs in 1-2 hours

Clinical features:

- ↑HR and CNS depression are the most common manifestations of early toxicity
- Anticholinergic: ↑HR, agitated delirium, mydriasis, urinary retention, warm dry skin, seizures
- α receptor antagonism: hypotension
- Na^+ channel blockade: myocardial dysfunction
- ECG manifestations: ↑QRS (>100 ms predictive of seizures and >160 ms predictive of ventricular arrhythmias), tall R-wave in aVR (R/S ratio>0.7)

Management

Patients with ↓GCS + ↑HR and history of TCA exposure require early intubation

Decontamination: Activated charcoal 50 g via NGT post intubation (or <1 hour post ingestion alert patients)

Antidote: NaHCO_3 (1 ml 8.4% solution = 1 mmol NaHCO_3)

- Indications: seizures, arrhythmias, ↑QRS, hypotension
- Bolus dose – 1 mL/kg 8.4% NaHCO_3 solution as slow (2 minutes) IV push
- Repeat bolus doses q5 minutes to rapidly acquire pH in 7.50-7.55 range.
- Infusion **NOT** indicated to maintain pH. Maintain with hyperventilation. Repeat boluses if deterioration.

Seizures (in the setting of acute toxicity <6 hours)

- Bolus NaHCO_3 solution as above. Diazepam 5 mg IV if seizure continues. Prepare for intubation.

Hypotension

- Initial 30 ml/kg crystalloid with **CONCURRENT** administration of 8.4% NaHCO_3 (as above)
- Norepinephrine for resistant hypotension **AFTER** IV fluid + correction of acidosis + Rx of arrhythmias

Ventricular arrhythmias/ Na^+ channel blockade

- 1 mL/kg 8.4% solution NaHCO_3 slow IV push, repeat q5 minutes until resolution of arrhythmia (avoid pH >7.55)
- Resistant arrhythmia with pH >7.55: Lidocaine 100 mg as an IV push (discuss with Clinical Toxicologist)
- Avoid β -blockers or amiodarone. Consider 3% hypertonic saline (100 mL) for resistant toxicity.

Disposition

- Discharge pending mental health assessment if clinically well (not tachycardic and normal conscious state) with normal ECG at 6 hours post exposure