EMERGENCY MANAGEMENT OF

ORGANOPHOSPHATE/CARBAMATE POISONING

or Acetylcholinesterase inhibitors (AChEIs) poisoning

RESUSCITATION COUNCIL OF SOUTHERN AFRICA

2026

EMSSA

History

Typically accidental or intentional ingestion of agricultural pesticides, can also be via skin exposure or vapour inhalation. Bioterrorism / Biological Warfare: Sarin / VX -nerve agent / Novichok

Classic features: miosis / diaphoresis / respiratory distress and a garlic or solvent odour

Clinical presentation of

Muscarinic Effects

(Mnemonic: DDUMBBBELLS)

(*Killer B's- Need Immediate intervention)

Cholinergic toxidrome

Diaphoresis
Defaecation
Urination
Miosis
Bronchorrhoea*
Bradycardia*
Bronchospasm*
Emesis
Lacrimation
Low blood pressure
Salivation

Nicotinic Effects

(Mnemonic: Weekdays)

Mydriasis
Tachycardia
Weakness
Hyper**T**ension
Fasciculations

Footnote: Clinical presentation
OPP is a spectrum illness, a mixed clinical presentation may be present depending on the agent, dose, timing and any treatment already provided.

CNS effects

(Mnemonic: Craze)

Confusion/**C**oma
Restlessness
Agitation
Sei**Z**ures
Emotional lability

Any disturbance to the brain causes a variety of CNS abnormalities not specific to one diagnosis

Decontamination

Perform early, avoid delaying antidote treatment

Healthcare Providers PPE: Standard precautions are sufficient for oral ingestion. Target decontamination for agent exposure to dermal and ocular exposures: Gloves (nitrile or neoprene), gowns, eye protection
Remove exposure or remove the patient from the exposure
Skin contact: Remove all clothing and wash patient thoroughly with soap and water.
Eye contact: Flush with water or saline for at least 15 min

Antidote

Treat early if clinical suspicion and cholinergic toxidrome apparent

Atropine

Indications (Killer B's): Pulmonary compromise (bronchorrhoea, bronchospasm, hypoxia)
Bradycardia **with** haemodynamic instability
(Hypotension, Altered LOC, poor peripheral perfusion or signs of shock)

Dose for adults and paeds:
0.05mg/kg IV/IO
Start with 2-4mg for an adult
Dose should be doubled every 3-5min until initial atropinisation

Atropinisation

A clinical state when life-threatening muscarinic effects have been adequately treated

The signs of adequate atropinisation:

- Resolution of Bronchospasm and -secretions with improved ventilation/oxygenation
- Haemodynamic stability with adequate perfusion

Heart rate, pupil size and skin dryness should not be used as primary targets for atropinisation

Atropine Infusion

Indicated after atropinisation to maintain control of clinically significant muscarinic toxicity

Start infusion: 10-20% of the cumulative atropinisation dose in 200ml NS, per hour to maintain atropinisation. Titrate to response
If pulmonary and haemodynamic instability re-occurs: Provide IV bolus Atropine then recalculate infusion dose

(If pt needed 20mg Atropine in escalation bolus doses to reach atropinisation, starting infusion rate will be 2-4mg/hour)

Resuscitation and Monitoring

Airway

Open, maintain and intubate if needed
(avoid using Succinylcholine)
Suction secretions regularly

Breathing

Oxygenate with high flow oxygen, aim for SpO2 of >94%
Optimize oxygenation to prevent hypoxia and arrhythmias

Circulation

IV or IO access
Provide balanced crystalloid fluids as needed aim for a MAP of ≥ 65mmHg or SBP≥ 90mmHg
Escalate if hypotension persists,
if hypotension is refractory, provide early vasopressor support

Adjunctive Treatment

- Seizure control: Diazepam 5-10mg IV bolus (0.2mg/kg in paed)
  Other Benzodiazepines can be used
- Consider co-ingestion of other drugs or toxins
- Poison Info Centre: 0861 555 777

Atropine Toxicity

Tachyarrhythmia, Hyperthermia, Mydriasis

- Reduce or temporarily pause atropine infusion with close reassessment of recurrence of muscarinic effects
- Adequate rehydration with IV fluids
- Benzodiazepine for agitation