Clinical Practice Guidelines: Toxicology and toxinology/Organophosphate/cholinergic

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<th>Date</th>
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<td>Purpose</td>
<td>To ensure a consistent approach to the management of Organophosphate/cholinergic poisoning.</td>
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<td>Scope</td>
<td>Applies to all QAS clinical staff.</td>
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Organophosphates are pesticides that inhibit acetylcholinesterase enzymes, increasing the action of the neurotransmitter acetylcholine at parasympathetic and presynaptic sympathetic ganglion receptors. Acetylcholine excess leads to a cholinergic syndrome, and may be fatal.[1]

Carbamates are similar to organophosphates in toxicity but the clinical features are typically less severe.[1]

**Organophosphates:** chlorpyrifos, coumaphos, diazinon, dichlorvos, dimethoate, fenthion, malathion, parathion, trichlorfon

**Carbamates:** aldicarb, carbendazole, carbendazim, carbazine

**Nerve agents:** sarin, tabun, soman

**Pharmaceuticals:** neostigmine, pyridostigmine, edrophonium, pilocarpine, bethanechol, carbachol, acetylcholine

**Clinical features**

Clinical features are of cholinergic excess. The onset can be delayed up to 12 hours with some agents.

**Muscarinic excess ‘DUMBBELS’**[2]
- Diarrhoea
- Urination
- Miosis (constricted pupils)
- Bronchorrhoea/bronchospasm
- Bradycardia
- Emesis
- Lacrimation
- Salivation
- Hypotension (is a late sign and suggests severe toxicity)

**Nicotinic excess**
- fasciculations
- tremor
- muscle weakness
- respiratory muscle paralysis

**Central effects**
- agitation
- seizures
- coma
**Risk Assessment**

- Deliberate self poisoning can be life-threatening.\(^3\)

**Additional information**

- Atropine is used to block the muscarinic affects of acetylcholine.\(^4\)
- In life threatening toxicity, large cumulative doses of atropine may be required.
- A chemical pneumonitis can develop if the hydrocarbon solvent is aspirated.\(^1\)
- Universal precautions are sufficient to prevent contamination of others.\(^5\)
- Cholinergic syndrome may also result from nicotinic agents (nicotine patches, tobacco products and plants) and muscarinic agents (mushrooms).
- Inhalational or dermal exposure is rarely life-threatening. The smell of agent does not indicate exposure as it is usually the solvent and poses no toxicity risk to paramedics or bystanders.\(^6\)

**CPG: Paramedic Safety**

**CPG: Standard Cares**

**Decontamination**
- Remove clothes and wash skin with soap and water

**Evidence of serious toxicity?**
- Hypotension
- Bronchospasm
- Paralysis
- Seizure
- Coma

**Consider:**
- Atropine
- Oxygen
- IPPV
- IV access
- IV fluid

**Transport to hospital**
Pre-notify as appropriate

**Note:** Officers are only to perform procedures for which they have received specific training and authorisation by the QAS.