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All feedback and suggestions are welcome. Please forward to: Clinical.Guidelines@ambulance.qld.gov.au

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**Organophosphates** are pesticides that inhibit acetylcholinesterase enzymes, increasing the action of the neurotransmitter acetylcholine. Acetylcholine excess leads to a cholinergic syndrome that may be fatal.[1] Carbamates are similar to organophosphates in toxicity, but the clinical features are typically less severe.[1]

<table>
<thead>
<tr>
<th>Organophosphates:</th>
<th>Chlorpyrifos</th>
<th>Coumaphos</th>
<th>Diazinon</th>
<th>Dichlorvos</th>
<th>Dimethoate</th>
<th>Fenthion</th>
<th>Malathion</th>
<th>Trichlorfon</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Carbamates:</th>
<th>Carbendazim</th>
<th>Oxamyl</th>
<th>Carbofuran</th>
<th>Methomyl</th>
<th>Methiocarb</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Nerve agents:</th>
<th>Sarin</th>
<th>Tabun</th>
<th>Soman</th>
<th>VX</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pharmaceuticals:</th>
<th>Rivastigmine</th>
<th>Pyridostigmine</th>
<th>Pilocarpine</th>
<th>Bethanechol</th>
</tr>
</thead>
</table>

**Clinical features**

Clinical features are of cholinergic excess. The onset can be delayed up to 12 hours with some agents. All patients with suspected exposures should be transported to hospital for assessment.

**Clinical features of Muscarinic excess ‘DUMBBELS’**[2]

- Diarrhoea
- Urination
- Miosis (constricted pupils)
- Bronchorrhoea/bronchospasm
- Bradycardia
- Emesis
- Lacrimation
- Salivation
- Hypotension (a late sign and suggests severe toxicity)

**Clinical features of 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

- Universal precautions are sufficient to prevent contamination of others.[4]
- Atropine is used to block the muscarinic effects of acetylcholine.[5]
- In life-threatening toxicity, large cumulative doses of atropine may be required.
- A chemical pneumonitis can develop if the hydrocarbon solvent is aspirated.[6]
- 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 an agent does not indicate exposure as it is usually the solvent and poses no toxicity risk to ambulance officers or bystanders.[6]

Consider:

- Verbal de-escalation
- QPS assistance
- Physical restraint
- EEA

Manage as per:

CPG: Sedation – Acute behavioural disturbance

Ongoing imminent risk of harm?

Y

EDVENCE OF SERIOUS TOXICITY?

- Hypotension
- Bradycardia
- Bronchospasm
- Paralysis
- Seizures
- Coma

Consider:

- Atropine
- Oxygen
- IPPV
- IV access
- IV fluid

N

DECONTAMINATION

Remove clothing and wash skin (with soap and water if available)

N

Consider:

- Oxygen
- IV access
- Antiemetic

Transport to hospital

Pre-notify as appropriate

Note: Clinicians must only perform procedures for which they have received specific training and authorisation by the QAS.