Organophosphate and carbamate poisoning: Rapid overview of emergency management

To obtain emergency consultation with a medical toxicologist, in the United States, call 1-800-222-1222 for the nearest regional poison control center. Contact information for poison control centers around the world is available at the WHO website and in the UpToDate topic on regional poison control centers (society guideline links).
Clinical syndromes
Acute toxicity
Generally manifests in minutes to hours
Evidence of cholinergic excess
SLUDGE = Salivation, Lacrimation, Urination, Defecation, Gastric Emptying
BBB = Bradycardia, Bronchorrhea, Bronchospasm
Respiratory insufficiency can result from muscle weakness, decreased central drive, increased secretions, and bronchospasm
Intermediate syndrome
Occurs 24-96 hours after exposure
Bulbar, respiratory, and proximal muscle weakness are prominent features
Generally resolves in 1-3 weeks
Organophosphorus Agent-Induced Delayed Peripheral Neuropathy (OPIDN)
Usually occurs several weeks after exposure
Primarily motor involvement
May resolve spontaneously, but can result in permanent neurologic dysfunction
Diagnostic evaluation of acute toxicity
Atropine challenge if diagnosis is in doubt (1 mg IV in adults, 0.01 to 0.02 mg/kg in children)
Absence of anticholinergic signs (tachycardia, mydriasis, decreased bowel sounds, dry skin) strongly suggests poisoning with organophosphate or carbamate
Draw blood sample for measurement of RBC acetylcholinesterase activity to confirm diagnosis

Treatment of acute toxicity
Deliver 100% oxygen via facemask; early intubation often required; avoid succinylcholine
Decontamination if ingestion within 1 hour give single dose activated charcoal, adult 50 g (1 g/kg in children) unless airway not protected or other contraindication. Aggressive dermal and ocular irrigation as needed. Bag/discard clothing.
Atropine 2 to 5 mg IV/IM/IO bolus (0.05 mg/kg IV in children)
Escalate (double) dose every 3-5 minutes until bronchial secretions and wheezing stop
TACHYCARDIA AND MYDRIASIS ARE NOT CONTRAINDICATIONS TO ATROPINE USE
Hundreds of milligrams may be needed over several days in severe poisonings
Inhaled ipratropium 0.5 mg with parenteral atropine may be helpful for bronchospasm; may repeat
Pralidoxime (2-PAM) 2 g (25 mg/kg in children) IV over 30 minutes; may repeat after 30 minutes or give continuous infusion if severe
Continuous infusion at 8 mg/kg/hour in adults (10 mg/kg/hour in children)
If no IV access, give pralidoxime 600 mg IM (15 mg/kg in children <40 kg). Rapidly repeat as needed to total of 1800 mg or 45 mg/kg in children.
Pralidoxime is given with atropine
Benzodiazepine therapy
Diazepam 10 mg IV (0.1 to 0.2 mg/kg in children), repeat as necessary if seizures occur. Do not give phenytoin.

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