pralidoxime  (pra-li-dox-eem)

**Drug Classifications:**
- Antiparasitic: anticholinesterase reactivators
- Therapeutic: antidotes

**Pharmacologic Classifications:**
- Cholinesterase reactivators

**Pregnancy Category:** C

**Indications**
Early (first 24–36 hr) treatment of organophosphate anticholinesterase insecticide poisoning, usually with atropine and supportive measures, including mechanical ventilation, if necessary. Management of anticholinesterase (neostigmine, pyridostigmine, edrophonium) poisoning. Discontinued.

**Action**
Inhibits cholinesterase after poisoning with anticholinesterase agents. May also directly reactivate organophosphates. Therapeutic Effects: Reversal of muscle paralysis after organophosphate poisoning.

**Pharmacokinetics**
- **Absorption:** IV administration results in complete bioavailability.
- **Distribution:** Widely distributed throughout extracellular water. Does not appear to enter the CNS.
- **Metabolism and Excretion:** 80–90% excreted unchanged by the kidneys.
- **Half-life:** 0.8–2.7 hr.

**TIME/ACTION PROFILE (plasma levels)**

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<th>ROUTE</th>
<th>ONSET</th>
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<tr>
<td>IV</td>
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**Contraindications/Precautions**
- **Contraindicated in:** Hypersensitivity.
- **Use Cautiously in:** Myasthenia gravis (may precipitate myasthenic crisis); Renal impairment (dose q required); Efficacy in carbamate insecticide poisoning is not known (may precipitate toxicity); OB, Lactation: Safety not established.

**Adverse Reactions/Side Effects**

| CNS | **CNS:** | dizziness, drowsiness, headache. |
| EENT | **EENT:** | blurred vision, diplopia, impaired accommodation. |
| Resp | **Resp:** | LARYNGOSPASM, hyperventilation. |
| CV | **CV:** | tachycardia. |
| GI | **GI:** | nausea. |
| Derm | **Derm:** | rash. |
| Local | **Local:** | pain at injection site. |
| MS | **MS:** | muscle rigidity, muscle weakness, neuromuscular blockade. |

**Interactions**
- **Drug-Drug:** Avoid concurrent use with succinylcholine, morphine, amino-phylline, theophylline, reserpine, and respiratory depressants, including barbiturates, opioid analgesics, and sedative/hypnotics, in patients with anticholinesterase poisoning.

**Route/Dosage**
- **IV route is preferred.** In organophosphate poisoning, atropine 2–4 mg IV is given concurrently after hypoxemia is improved. Atropine is repeated q5–10 min until toxicity is encountered and is then continued for at least 6 hr.

**Organophosphate Poisoning**

- **(Adults):** 1–2 g can be repeated in 1 hr if muscle paralysis is still present. Additional doses may be given q10–12 hr if muscle weakness persists. IV route is preferred. Dose available may be given q6 hr or hourly.
- **(Children <16 yr):** Mild symptoms—600 mg; if mild symptoms persist after 15 min, given another 600 mg; if mild symptoms persist after 15 min, given another 600 mg; if symptoms continue to persist after 1 hr of last 600–mg dose, may repeat dosing regimen of three 600–mg doses given 15 min apart. Severe symptoms—Administer three 600–mg doses in rapid succession (total of 1800 mg), if symptoms continue to persist after 1 hr of last 600–mg dose, may repeat dosing regimen of three 600–mg doses given in rapid succession.
- **(Children ≥16 yr):** Give loading dose of 20–50 mg/kg over 15–30 min, after loading dose, may give another 20–50 mg/kg over 15–30 min in 1 hr (muscle paralysis is still present) (can repeat dose q10–12 hr as needed) or initiate continuous infusion of 10–20 mg/kg/hr. IV route is preferred, if not available, may be given IM or subcut.

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over symptoms—Administer three 15 mg/kg doses in rapid succession; if symptoms continue to persist after 1 hr of last 15 mg/kg dose, may repeat dosing regimen of three 15 mg/kg doses given in rapid succession.

Anticholinesterase Overdose

**IV (Adults):** 1– 2 g, followed by increments of 250 mg q 5 min as needed.

**NURSING IMPLICATIONS**

**Assessment**
- Determine type of insecticide and time of patient’s exposure. Therapy should begin as soon as possible within 24 hr. Contact poison control center for complete information on the specific insecticide.
- Monitor neurotoxicity status before and periodically throughout therapy. Document skeletal muscle strength, tidal volume, and vital capacity. Note presence of nicotinic effects of anticholinesterases (twitching, muscle cramps, fasciculations, weakness, pallor, tachycardia, increased BP).

**NURSING IMPLICATIONS**

- Closely monitor respirations, pulse, and BP. Rapid IV infusion rate may cause tachycardia, laryngospasm, muscle rigidity, and hypertension. If hypertension occurs, infusion rate may be decreased or infusion discontinued. Phentolamine may be required to control BP.
- Lab Test Considerations:
  - May cause AST, ALT, and CPK levels. These usually return to normal in 2 wk.

**Potential Nursing Diagnoses**

- Risk for injury (Indications)
- Ineffective airway clearance (Indications)

**Implementation**

- Concurrent atropine and supportive measures (suctioning, intubation, and ventilation) may be ordered. Atropine 2– 6 mg IV in adults (50– 100 mcg/kg in children) is given concurrently. If patient is cyanotic, give atropine IM while improving ventilatory status. Atropine is repeated every 5– 60 min until toxicity is encountered and is then continued for at least 4 hr. Atropine is used to reverse muscarinic effects (bronchoconstriction, droopy, cough, increased bronchial secretions, nausea, vomiting, abdominal cramps, diarrhea, increased sweating, salivation, lacrimation, bradycardia, decreased BP, miosis, blurred vision, tachycardia, increased sweating, increased BP, increased pulse).
- Pralidoxime is effective only against nicotinic effects.
- Dose may need to be repeated every 5– 8 hr if insecticide was ingested; absorption from bowel may continue.
- Emergency kit containing pralidoxime, sterile water for injection, 20-mL syringe, needle, and alcohol rinse is commercially available for subcut, IM, or IV injection.
- If dermal exposure has occurred, remove clothing and thoroughly wash hair and skin first in sodium bicarbonate, then with alcohol as soon as possible. Health care workers should wear gloves to prevent self-exposure. Carefully dispose of clothing to prevent contamination of others.
- IM Subcut: May be administered IM or subcut in patients unable to tolerate IV infusion. Reconstitute by adding 5.3 mL of sterile Water for Injection to the 1000 mg vial for a concentration of 300 mg/mL. Do not administer solutions that are discolored or contain particulate matter.
- IV Administration
  - Direct IV: Diluent: Reconstitute vial containing 1 g of powdered pralidoxime with 20 mL of sterile water for injection. May be administered without further dilution to patients who cannot tolerate IV infusion (for example, pulmonary edema). Concentration: Concentration will be 50 mg/mL. Rate: Administer over at least 5 min, not to exceed 250 mg/min.
  - Intermediant Infusion: Diluent: Dilute reconstituted pralidoxime in 100 mL of 0.9% NaCl. Rate: Infuse over 15– 30 min.

**Patient/Family Teaching**

- Explain purpose of medication to patient.

**Evaluation/Desired Outcomes**

- Reversal of respiratory and skeletal muscle weakness caused by exposure to organophosphate anticholinesterase insecticides or anticholinesterase overdose.

*Why was this drug prescribed for your patient?*