



# Poison HOTLINE

1-800-222-1222

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## Did you know .....

The nicotine cartridges used in electronic cigarettes contain varying concentrations of nicotine. While some may be as low as 0.6% (6 mg/mL), others may be as high as 3.6% (36 mg/mL).

Ingestion of as little as 1 or 2 drops of higher concentration products could produce significant symptoms in young children and as noted in the main article, symptoms can develop quickly.

It is important to identify the type of product being used in electronic cigarettes. While many may contain nicotine, other commonly used drugs (e.g. cannabis) may be used or "hacked" into the cartridge and can produce their own toxicity.

Call **1-800-222-1222** for treatment recommendations related to these or any agents.

## Nicotine

Nicotine is commonly found in tobacco products like cigarettes, cigars, and chewing tobacco, as well as in nicotine replacement therapies such as gum, patches, nasal sprays, e-cigarettes, and vaping devices. It is naturally present in the tobacco plant (*Nicotiana tabacum*) and several other plant species. Additionally, nicotine can be present in high concentrations in certain insecticides.

Nicotine binds to the nicotinic acetylcholine receptors that are found throughout the body, mainly in the autonomic nervous system, brain, and neuromuscular junction. Nicotine poisoning follows a characteristic two-phase pattern:

- **Phase 1:** Initial stimulation of nicotinic receptors in the sympathetic and parasympathetic ganglia and neuromuscular junctions.
- **Phase 2:** Inhibitory phase in which transmission in the autonomic ganglia and neuromuscular junction are blocked.

The toxic effects of nicotine are dose-dependent. Initial symptoms usually develop within 30-90 minutes of an acute exposure and include nausea, vomiting, salivation, dizziness, restlessness, confusion, diaphoresis, hypertension, tachycardia, and tachypnea. Patients can rapidly progress to more serious symptoms including muscle twitching, weakness, seizures, hypotension, bradycardia, respiratory depression, coma, and paralysis. The duration of clinical effects is typically 1-2 hours in minor poisonings and up to 24 hours in severe poisonings. Death may occur as early as one hour post-ingestion and is usually the result of respiratory failure.

There is no specific antidote for nicotine poisoning and treatment is primarily symptomatic and supportive care. Benzodiazepines are usually effective for treating seizures. Hypotension should be treated with IV fluids initially and vasopressors if needed. Atropine can be considered for the treatment of clinically significant cholinergic symptoms (e.g. salivation, bronchorrhea) or bradycardia. Respiratory depression may require intubation and mechanical ventilation. A minimum observation time of 4-6 hours after oral exposures should be considered, although ingestions involving intact nicotine patches may require longer observation periods. For treatment advice concerning nicotine, contact the Iowa Poison Control Center at 1-800-222-1222.

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