



American College of Medical Toxicology

Physicians Specializing in the Care of Poisoned Patients

What is nicotine and what forms of nicotine are available?

Nicotine is derived from the tobacco plant. The primary products that contain nicotine are tobacco-containing products such as cigarettes, cigars, pipe tobacco, and chewing tobacco. There are some nicotine containing smoking cessation products such as patches and gums. In addition, electronic cigarettes or “E-cigarettes”, contain purified nicotine and not tobacco and are increasing in popularity. Unlike tobacco products and the smoking cessation aids, liquid nicotine is not regulated by FDA or another federal agency (although some states have regulations).

Cigarettes: The amount of nicotine contained in a single cigarette varies. Only a fraction of the nicotine is inhaled since most of it goes off as side-stream smoke in the typical smoker. Nicotine toxicity from smoking is further limited because the effects of inhaled nicotine occur rapidly (within seconds), limiting further intake. Nicotine toxicity can occur through the ingestion of cigarettes or butts, typically eaten by young children, in which case a large amount of nicotine can be absorbed.

Chewing tobacco: Chewing tobacco is also called smokeless tobacco, or “dip.” The nicotine is absorbed through the oral surface. The nicotine content can be as high as that of “low nicotine cigarettes.” Chewing tobacco is associated with a very high risk of cancers in the mouth and throat.

Nicotine gum: Nicotine gums are used as an aide to smoking cessation. Gum contains a small amount of nicotine and raises the nicotine concentration in the body slower than cigarette smoking. Excess use of the gum is limited by adverse effects.

Nicotine patches: These patches contain a large amount of nicotine in order to allow the drug to be delivered continuously for many hours daily. If the patch is bitten and ingested, nicotine may leak and severe toxicity may occur.

E-cigarettes: This is a battery-powered device that vaporizes liquid nicotine, sometimes called “e-liquid” or “e-juice.” The nicotine in these preparations is often highly concentrated, and may be mixed with a flavoring agent such as blueberry, bubble gum, or vanilla. The containers range from the size of an eye-drop bottle to a gallon container, and often have designs that are appealing to a child, leading to concerns that children will be poisoned by these products. In addition, there are concerns that the simplicity and easy availability of these products may be a pathway to nicotine addiction for non-smokers. Its role in smoking cessation is currently unclear but likely could be beneficial.

What happens if my child accidentally eats nicotine?

Exposures to low doses of nicotine, well less than a cigarette or a few drops of e-liquid, causes nausea, tremor, rapid heart rate, and high blood pressure. Severe nicotine poisoning causes vomiting, confusion, irregular heart rate, seizures, and respiratory failure. Death may occur.

What happens if I take too much nicotine?

Nicotine poisoning can occur in children and adults. Symptoms of nicotine toxicity from tobacco products usually begin within 15 minutes of exposure, depending on the route of administration. If you develop only minor symptoms, recovery is relatively quick.

What treatments are available for nicotine poisoning?

There is no specific antidote for nicotine toxicity, so treatment can be complicated and is focused on treating the symptoms that occur individually with medications.

Sources of nicotine	
Source	Content (mg)
1 whole cigarette*	10-30
1 cigarette butt	5-7
1 cigar*	15-40
1 gram chewing tobacco	6-8
1 piece nicotine gum	2-4
1 nicotine patch**	8-100
1 vial (5ml) e-juice	0-100

*when used properly only a fraction (5-20%) of the nicotine is absorbed

**nicotine is slowly absorbed through the skin, and much of it remains in the patch at the end of use.

Ingestion of a toxic dose of nicotine			
		Onset	Symptoms
Dose	Low toxic dose (one tenth of a cigarette in children, Half to 1 whole cigarette in adults)	15-90 min	Tremor, nausea, increase in heart rate/blood pressure/respiratory rate, mental alertness, euphoria
		Within minutes- 1 hour	Nausea/vomiting/diarrhea, increase in heart rate/blood pressure/respiratory rate, headache, dizziness, confusion, seizures.
	High toxic dose (one third -1 whole cigarette in children, 1-3 whole cigarettes in adults)	30 min to 4 hours	Low blood pressure, slow heart rate, lethargy, weakness, paralysis