

What Are Inhalants?

A hand depressing an aerosol of a spray can

Also known as: “laughing gas” (nitrous oxide), “snappers” (amyl nitrite), “poppers” (amyl nitrite and butyl nitrite), “whippets” (fluorinated hydrocarbons), “bold” (nitrites), and “rush” (nitrites)

Inhalants are chemicals found in ordinary household or workplace products that people inhale on purpose to get “high.” Because many inhalants can be found around the house, people often don’t realize that inhaling their fumes, even just once, can be very harmful to the brain and body and can lead to death. In fact, the chemicals found in these products can change the way the brain works and cause other problems in the body.

Although different inhalants cause different effects, they generally fall into one of four categories.

Volatile solvents are liquids that become a gas at room temperature. They are found in:

Paint thinner, nail polish remover, degreaser, dry-cleaning fluid, gasoline, and contact cement
Some art or office supplies, such as correction fluid, felt-tip marker fluid, and electronic contact cleaner

Aerosols are sprays that contain propellants and solvents. They include:

Spray paint, hair spray, deodorant spray, vegetable oil sprays, and fabric protector spray

Gases may be in household or commercial products, or used in the medical field to provide pain relief. They are found in:

Butane lighters, propane tanks, whipped cream dispensers, and refrigerant gases
Anesthesia, including ether, chloroform, halothane, and nitrous oxide (commonly called “laughing gas”).

Nitrites are a class of inhalants used mainly to enhance sexual experiences. Organic nitrites include amyl, butyl, and cyclohexyl nitrites and other related compounds. Amyl nitrite was used in the past by doctors to help with chest pain and is sometimes used today to diagnose heart problems. Nitrites now are prohibited by the Consumer Product Safety Commission but can still be found, sold in small bottles labeled as “video head cleaner,” “room odorizer,” “leather cleaner,” or “liquid aroma.”

How Do Inhalants Affect the Brain?

The lungs absorb inhaled chemicals into the bloodstream very quickly, sending them throughout the brain and body. Nearly all inhalants (except nitrites) produce a pleasurable effect by slowing down brain activity. Nitrites, in contrast, expand and relax blood vessels.

Short-Term Effects

Within seconds, users feel intoxicated and experience effects similar to those of alcohol, such as slurred speech, lack of coordination, euphoria (a feeling of intense happiness), and dizziness. Some users also experience lightheadedness, hallucinations (seeing things that are not really there), and delusions (believing something that is not true). If enough of the chemical is inhaled, nearly all solvents and gases produce anesthesia—a loss of sensation—and can lead to unconsciousness.

The high usually lasts only a few minutes, causing people to continue the high by inhaling repeatedly, which is very dangerous. Repeated use in one session can cause a person to lose consciousness and possibly even die.

With repeated inhaling, many users feel less inhibited and less in control. Some may feel drowsy for several hours and have a headache that lasts a while.

Long-Term Effects

Inhalants often contain more than one chemical. Some chemicals leave the body quickly, but others stay for a long time and get absorbed by fatty tissues in the brain and central nervous system. Over the long term, the chemicals can cause serious problems:

Damage to nerve fibers. Long-term inhalant use can break down the protective sheath around certain nerve fibers in the brain and elsewhere in the body. When this happens, nerve cells are not able to send messages as well, which can cause muscle spasms and tremors or even permanent trouble with basic actions like walking, bending, and talking. These effects are similar to what happens to people with multiple sclerosis.

Damage to brain cells. Inhalants also can damage brain cells by preventing them from getting enough oxygen. The effects of this condition, also known as brain hypoxia, depend on the area of the brain affected. The hippocampus, for example, is responsible for memory, so someone who repeatedly uses inhalants may be unable to learn new things or may have a hard time carrying on simple conversations. If the cerebral cortex is affected, the ability to solve complex problems and plan ahead will be compromised. And, if the cerebellum is affected, it can cause a person to move slowly or be clumsy.

What Are the Other Effects of Inhalants?

Regular use of inhalants can cause serious harm to vital organs and systems besides the brain. Inhalants can cause:

- Heart damage
- Liver failure
- Muscle weakness
- Aplastic anemia—the body produces fewer blood cells
- Nerve damage, which can lead to chronic pain

Damage to these organs is not reversible even when the person stops abusing inhalants.

Effects of Specific Chemicals

Depending on the type of inhalant used, the harmful health effects will differ. The table below lists a few examples.

Inhalant	Examples	Effects
	Amyl nitrite, butyl nitrite	Poppers, video head cleaner

- Sudden sniffing death
- Weakened immune system
- Damage to red blood cells (interfering with oxygen supply to vital tissues)

Benzene Gasoline

- Bone marrow damage
- Weakened immune system
- Increased risk of leukemia (a form of cancer)
- Reproductive system complications

Butane, propane Lighter fluid, hair and pain sprays

- Sudden sniffing death from heart effects
- Serious burn injuries

Freon (difluoroethane substitutes) Refrigerant and aerosol propellant

- Sudden sniffing death
- Breathing problems and death (from sudden cooling of airways)
- Liver damage

Methylene chloride

Paint thinners and removers, degreasers

Poor ability of blood to carry oxygen to the brain and body
Changes to heart muscle and heartbeat

Nitrous oxide, hexane

“Laughing gas”

Death from lack of oxygen to the brain
Altered perception and motor coordination
Loss of sensation
Spasms
Blackouts caused by blood pressure changes
Depression of heart muscle functioning

Toluene Gasoline, paint thinners and removers, correction fluid

Brain damage (loss of brain tissue mass, impaired thinking, loss of coordination, limb spasms, hearing and vision loss)
Liver and kidney damage

Trichloroethylene

Spot removers, degreasers

Sudden sniffing death
Liver disease
Reproductive problems
Hearing and vision loss

Butane gas, found in cigarette lighters and refills, makes the heart extra sensitive to a chemical naturally found in the body that carries messages from the central nervous system to the heart. This chemical, noradrenaline, tells the heart to beat faster when someone is stressed. If the heart becomes too sensitive to noradrenaline, it can affect the heart's rhythm, which can cause death.

Nitrite use has other health risks. Unlike most other inhalants, which act directly on the brain, nitrites make blood vessels bigger, allowing more blood to flow through them. Inhaled nitrites make the heart beat faster and produce a sensation of heat and excitement that can last for several minutes. Nitrites can also cause dizziness and headaches. Nitrites are associated with unsafe sexual practices that can increase the risk for getting and spreading diseases such as HIV and hepatitis.

Signs of Inhalant Use

Sometimes you can see signs that tell you a person is abusing inhalants, such as:

- Chemical odors on breath or clothing
- Paint or other stains on the face, hands, or clothing
- Hidden empty spray paint or solvent containers, or rags or clothing soaked with chemicals
- Drunk or disoriented actions
- Slurred speech
- Nausea (feeling sick) or loss of appetite and weight loss
- Confusion, inattentiveness, lack of coordination, irritability, and depression

Resources

National Institute on Drug Abuse. DrugFacts: Inhalants (<http://www.drugabuse.gov/publications/drugfacts/inhalants>). Bethesda, MD: NIDA, NIH, DHHS. Revised September 2012. Retrieved December 2012.

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