

Inhalants

Friends, Colleagues, and Parents:

One of the most dangerous substances abused by children and teens may be found in the home. These toxic substances are collectively referred to as inhalants—breathable chemical vapors that produce mind-altering effects. A variety of common products contain substances that can be inhaled. Many people do not think that products such as spray paints, nail polish remover, hair spray, glues, and cleaning fluids present any risk of abuse, because their intoxicating effects are so totally unconnected to their intended uses. Yet, young children and adolescents are among those most likely to abuse them, and do seek them out for this purpose. Adults should store household products carefully to prevent accidental inhalation; they should also remain aware of the temptations that these dangerous substances pose to children in their homes.

National surveys, such as the National Survey on Drug Use and Health (NSDUH) and Monitoring the Future (MTF), indicate that inhalant abuse is particularly prevalent among our Nation's young people. Some young people may abuse inhalants as a substitute for alcohol because they can be obtained easily. Data suggest that inhalant abuse reaches its peak at some point during the seventh through ninth grades. According to MTF, eighth-graders regularly report the highest rates of abuse. In fact, MTF data for 2004 showed a significant increase in lifetime inhalant use among eighth-graders.

In 2002, the Nation's emergency departments reported almost 1,500 mentions of inhalant abuse by patients. Regular abuse of inhalants can cause serious damage to major organs, including the brain, liver, heart, kidneys, and lungs. However, even a single session of repeated inhalations can lead to cardiac arrest and death by altering normal heart rhythms or by preventing enough oxygen from entering the lungs, causing suffocation.

This *Community Drug Alert Bulletin* provides a synopsis of some of the latest scientific findings on inhalants and inhalant abuse. We hope that this information will help alert readers to inhalant abuse and its harmful effects and aid your community's efforts to deal effectively with this problem.

Thank you for taking the time to become better informed about this public health problem.

Sincerely,



Nora D. Volkow, M.D.
Director

What are Inhalants?

Inhalants are volatile substances that produce chemical vapors that can be inhaled to induce psychoactive, or mind-altering, effects. Although other abused substances can be inhaled, the term “inhalants” is used to describe a variety of substances whose main common characteristic is that they are rarely, if ever, taken by any route other than inhalation. Many young people breathe the vapors from these products hoping for a quick high, unaware of the serious health consequences of their actions.

Common household inhalant products:

- nail polish remover
- spray paint and glue
- lighter fluid
- hair and deodorant sprays
- cleaning fluid
- whipped cream canisters

Common medical/industrial inhalant products:

- gasoline
- dry cleaning fluid
- nitrous oxide (laughing gas)
- paint thinner
- paint remover

Types of Inhalants

Volatile Solvents

Volatile solvents are liquids that vaporize at room temperature. They are found in:

- paint thinners and removers, dry cleaning fluids, degreasers, and gasoline
- glues, correction fluids, felt-tip marker fluids, and electronic contact cleaners

Gases

Gases include household or commercial products such as:

- butane (from lighters), propane (gas grills), and cooling system fluids
- medical anesthetic gases, such as ether, chloroform, halothane, and nitrous oxide

Aerosols

Aerosols are sprays that contain propellants and solvents. Some common aerosols include:

- spray paint, hair and deodorant sprays, whipped cream dispensers, fabric protector sprays, and vegetable oil cooking sprays

Nitrites

Nitrites are a special class of inhalants. While other inhalants are used to alter mood, organic nitrites are used primarily as sexual enhancers. Organic nitrites include amyl, butyl, and cyclohexyl nitrites and other related compounds, and are commonly known as “poppers.” Amyl nitrite was used in the past to alleviate chest pain and is sometimes used today for diagnostic purposes in heart examinations. Most poppers contain isobutyl nitrite or butyl nitrite. These nitrites are often sold in small brown bottles and labeled as “video head cleaner,” “room odorizer,” “leather cleaner,” or “liquid aroma.”

How Are Inhalants Abused?

Inhalants can be breathed in through the nose or the mouth in a variety of ways, such as:

- Sniffing or “snorting” fumes from containers
- Spraying aerosols directly into the nose or mouth
- “Bagging,” which involves sniffing or inhaling fumes from substances sprayed or deposited inside a plastic or paper bag
- “Huffing” from an inhalant-soaked rag stuffed in the mouth
- Inhaling from balloons filled with nitrous oxide

Because intoxication lasts only a few minutes, abusers frequently try to prolong the high by continuing to inhale repeatedly over the course of several hours, a very dangerous practice.

What Are the Health Hazards Associated With Inhalants?

Animal and human research show that most inhalants are extremely toxic:

- Chronic exposure can lead to widespread and long-lasting damage to the brain and other parts of the nervous system. Nerve damage can be similar to that seen in individuals with neurological diseases such as multiple sclerosis.
- Chronic exposure can produce significant damage to the heart, lungs, liver, and kidneys.
- Prolonged abuse can negatively affect a person’s cognition, movement, vision, and hearing.
- Highly concentrated amounts of certain inhalants can lead to sudden sniffing death—heart failure and death can occur within minutes of repeated inhalations. Sudden sniffing death is particularly associated with the abuse of butane, propane, and chemicals in aerosols, and can result from a single session of inhalant abuse by an otherwise healthy person.

- High concentrations of inhalants can cause death by:
 - Asphyxiation—vapors displace oxygen in the lungs
 - Suffocation—oxygen is blocked from entering the lungs when inhaling fumes from a plastic bag placed over the head
 - Convulsions or seizures—caused by abnormal electrical discharges in the brain
 - Coma—the brain shuts down all but the most vital functions
 - Choking—from inhaling vomit prompted by inhalant use
 - Fatal injury— from accidents, such as motor vehicle crashes, that occur while intoxicated

What Are the Effects of Inhalant Use?

Most inhalants act directly on the central nervous system (CNS) to produce psychoactive, or mind-altering, effects. They have short-term effects similar to anesthetics, which slow the body's functions.

- Nearly all abused inhalants, other than nitrites, produce a pleasurable effect by depressing the CNS.
- Nitrites make the heart beat faster and produce a sensation of heat and excitement.
- Inhaled chemicals are rapidly absorbed through the lungs into the bloodstream and are quickly distributed to the brain and other organs.
- Within minutes of inhaling, the user experiences intoxication along with other effects similar to those produced by alcohol. Alcohol-like effects include slurred speech, muscle weakness, belligerence, apathy, impaired judgment, euphoria, and dizziness. In addition, users may experience lightheadedness, hallucinations, and delusions.
- Toluene can produce headache, euphoria, giddy feelings, and an inability to coordinate movements. Exposure to high doses can cause confusion and delirium. Nausea and vomiting are other common side effects.
- Successive inhalations may make users feel less inhibited and less in control. Continued use of inhalants in sufficient amounts can produce anesthesia, a loss of sensation, and unconsciousness. After using inhalants heavily, abusers may feel drowsy for several hours and experience a lingering headache.
- Many individuals who abuse inhalants for prolonged periods over many days report a strong need to continue using them. Compulsive use and a mild withdrawal syndrome can occur with long-term inhalant abuse. Long-term inhalant abusers may exhibit other symptoms, including weight loss, muscle weakness, disorientation, inattentiveness, lack of coordination, irritability, and depression.

Even when using aerosols or volatile products for their legitimate purposes, such as painting or cleaning, it is wise to do so in a well-ventilated room or outdoors. The chances of suffocation are greatly increased by inhaling chemicals from a paper or plastic bag or in an enclosed area.

HAZARDS OF CHEMICALS FOUND IN COMMONLY ABUSED INHALANTS

amyl nitrite, butyl nitrite

("poppers," "video head cleaner")

sudden sniffing death syndrome, suppressed immunologic function, injury to red blood cells (interfering with oxygen supply to vital tissues)

benzene *(found in gasoline)*

bone marrow injury, impaired immunologic function, increased risk of leukemia, reproductive system toxicity

butane, propane

(found in lighter fluid, hair and paint sprays) sudden sniffing death syndrome via cardiac effects, serious burn injuries (because of flammability)

freon *(used as a refrigerant and aerosol propellant)*

sudden sniffing death syndrome, respiratory obstruction and death (from sudden cooling/cold injury to airways), liver damage

methylene chloride

(found in paint thinners and removers, degreasers)

reduction of oxygen-carrying capacity of blood, changes to the heart muscle and heartbeat

nitrous oxide *("laughing gas"), hexane*

death from lack of oxygen to the brain, altered perception and motor coordination, loss of sensation, limb spasms, blackouts caused by blood pressure changes, depression of heart muscle functioning

toluene

(found in gasoline, paint thinners and removers, correction fluid)

brain damage (loss of brain tissue mass, impaired cognition, gait disturbance, loss of coordination, loss of equilibrium, limb spasms, hearing and vision loss), liver and kidney damage

trichlorethylene *(found in spot removers, degreasers)*

sudden sniffing death syndrome, cirrhosis of the liver, reproductive complications, hearing and vision damage

Who Abuses Inhalants?

- People who abuse inhalants live in both urban and rural settings. Poverty, a history of physical or sexual abuse, poor grades, and school dropout all are associated with inhalant abuse.
- Most inhalant abusers are younger than age 25. One national survey indicates that about 3 percent of U.S. children have tried inhalants by the time they reach fourth grade.
- Eighth-graders generally abuse at higher rates than 10th- or 12th-graders.
- In 2004, 8th-grade girls reported more inhalant abuse than boys, while 12th-grade boys reported more than girls.

Please visit www.inhalants.drugabuse.gov for more information on the health effects of inhalants.

National Clearinghouse for Alcohol and Drug Information (NCADI): 1-800-729-6686



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HOW CAN INHALANT ABUSE BE RECOGNIZED?

Early identification and intervention are the best ways to stop inhalant abuse before it causes serious health consequences. Parents, educators, family physicians, and other health care practitioners should be alert to the following signs of a serious inhalant abuse problem:

- Chemical odors on breath or clothing
- Paint or other stains on face, hands, or clothes
- Hidden empty spray paint or solvent containers and chemical-soaked rags or clothing
- Drunk or disoriented appearance
- Slurred speech
- Nausea or loss of appetite
- Inattentiveness, lack of coordination, irritability, and depression

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