

## Inhalants

Inhalants are breathable chemical vapors that produce psychoactive (mind-altering) effects. A variety of products commonplace in the home and in the workplace contain substances that can be inhaled. Many people do not think of these products, such as spray paints, glues, and cleaning fluids, as drugs because they were never meant to be used to achieve an intoxicating effect. Yet, young children and adolescents can easily obtain them and are among those most likely to abuse these extremely toxic substances. Parents should monitor household products closely to prevent accidental inhalation by very young children. Inhalants fall into the following categories:

### **Solvents**

- Industrial or household solvents or solvent-containing products, including paint thinners or removers, degreasers, dry-cleaning fluids, gasoline, and glue
- Art or office supply solvents, including correction fluids, felt-tip-marker fluid, and electronic contact cleaners

### **Gases**

- Gases used in household or commercial products, including butane lighters

and propane tanks, whipping cream aerosols or dispensers (whippets), and refrigerant gases

- Household aerosol propellants and associated solvents in items such as spray paints, hair or deodorant sprays, and fabric protector sprays
- Medical anesthetic gases, such as ether, chloroform, halothane, and nitrous oxide ("laughing gas")

### **Nitrites**

- Aliphatic nitrites, including cyclohexyl nitrite, an ingredient found in room odorizers; amyl nitrite, which is used for medical purposes; and butyl nitrite (previously used to manufacture perfumes and antifreeze), which is now an illegal substance

### **Health Hazards** ———

Although they differ in makeup, nearly all abused inhalants produce short-term effects similar to anesthetics, which act to slow down the body's functions. When inhaled via the nose or mouth into the lungs in sufficient concentrations, inhalants can cause intoxicating effects. Intoxication usually lasts only a few minutes.

However, sometimes users extend this effect for several hours by breathing in inhalants repeatedly. Initially, users may feel slightly stimulated. Successive inhalations make them feel less inhibited and less in control. If use continues, users can lose consciousness.

Sniffing highly concentrated amounts of the chemicals in solvents or aerosol sprays can directly induce heart failure and death within minutes of a session of prolonged use. This syndrome, known as “sudden sniffing death,” can result from a single session of inhalant use by an otherwise healthy young person. Sudden sniffing death is particularly associated with the abuse of butane, propane, and chemicals in aerosols.

High concentrations of inhalants also can cause death from suffocation by displacing oxygen in the lungs and then in the central nervous system so that breathing ceases. Deliberately inhaling from an attached paper or plastic bag or in a closed area greatly increases the chances of suffocation. Even when using aerosols or volatile products for their legitimate purposes (i.e., painting, cleaning), it is wise to do so in a well-ventilated room or outdoors.

Chronic abuse of solvents can cause severe, long-term damage to the brain, the liver, and the kidneys.

Harmful irreversible effects that may be caused by abuse of specific solvents include:

- Hearing loss—toluene (spray paints, glues, dewaxers) and trichloroethylene (cleaning fluids, correction fluids)
- Peripheral neuropathies, or limb spasms—hexane (glues, gasoline) and nitrous oxide (whipping cream, gas cylinders)
- Central nervous system or brain damage—toluene (spray paints, glues, dewaxers)
- Bone marrow damage—benzene (gasoline)

Serious but potentially reversible effects include:

- Liver and kidney damage—toluene-containing substances and chlorinated hydrocarbons (correction fluids, dry-cleaning fluids)
- Blood oxygen depletion—aliphatic nitrites (known on the street as poppers, bold, and rush) and methylene chloride (varnish removers, paint thinners)

Abuse of amyl and butyl nitrites has been associated with Kaposi’s sarcoma (KS), the most common cancer reported among AIDS patients. Early studies of KS showed that many people with KS had used volatile nitrites. Researchers are continuing

to explore the hypothesis of nitrites as a factor contributing to the development of KS in HIV-infected people.

## **Extent of Use** —————

Initial use of inhalants often starts early. Some young people may use inhalants as a cheap, accessible substitute for alcohol. Research suggests that chronic or long-term inhalant abusers are among the most difficult drug abuse patients to treat. Many suffer from cognitive impairment and other neurological dysfunction and may experience multiple psychological and social problems.

### **2002 Monitoring the Future Study (MTF)\***

NIDA's nationwide annual survey of drug use among the Nation's 8th-, 10th-, and 12th-graders indicates that inhalant use for 8th- and 10th-graders appears to have peaked in 1995, and in 1990 for 12th-graders, and has declined since then. In 2002, lifetime, past-year, and past-month inhalant use among 8th- and 10th-graders was the lowest seen in the history of the survey and the lowest in about 20 years for high school seniors.

In 2002, a pattern of higher rates of use by younger children continued as more 8th-graders than 10th- or 12th-graders said they used inhalants. However, the

percentage of 8th-graders who said they had ever used inhalants decreased from 17.1 percent in 2001 to 15.2 percent in 2002. This represents a substantial decline from the peak year of 1995 when 21.6 percent of 8th-graders said they had used inhalants during their lifetimes.

### **2002 Drug Abuse Warning Network (DAWN)\*\***

Emergency department mentions of inhalants increased 187 percent, from 522 in 2001 to 1,496 in 2002, returning to the approximate level observed in 2000.

### **2002 National Survey on Drug Use and Health (NSDUH)\*\*\***

Among youths age 12 to 17, 11.6 percent were current illicit drug users in 2002, and 1.2 percent were current inhalant users. Among 12- or 13-year-olds, 1.4 percent used inhalants. In 2002, 71 percent of inhalant users were age 12 to 25.

The number of new inhalant users increased from 627,000 new users in 1994 to 1.2 million in 2000. During this period, more males initiated inhalant use than females. The number of new inhalant users in 2001 was similar to the number in 2000 (1.1 million). Inhalant initiates in 2001, as well as in prior years, were predominantly under age 18 (71 percent in 2001).

## Other Information Sources ———

For additional information on inhalants, please refer to the following sources on

NIDA's Web site, [www.drugabuse.gov](http://www.drugabuse.gov):

Inhalant Abuse—*Research Report Series*  
Various issues of *NIDA NOTES* (search by "inhalants" or "solvents")

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\*Conducted annually since 1975, MTF assesses drug use and attitudes among 8th-, 10th-, and 12th-graders, college students, and young adults nationwide. The survey is conducted by the University of Michigan's Institute for Social Research and is funded by NIDA. Copies of the latest published survey are available from the National Clearinghouse for Alcohol and Drug Information at 1-800-729-6686 or may be downloaded from [www.monitoringthefuture.org](http://www.monitoringthefuture.org).

\*\* The latest data on drug abuse-related hospital emergency department (ED) visits are from the 2002 DAWN report, from HHS's Substance Abuse and Mental Health Services Administration. These data are from a national probability survey of 437 hospital EDs in 21 metropolitan areas in the U.S. during the year. For detailed information from DAWN, visit [www.samhsa.gov/statistics/statistics.html](http://www.samhsa.gov/statistics/statistics.html), or call the National Clearinghouse for Alcohol and Drug Information at 1-800-729-6686.

\*\*\*The 2002 NSDUH, produced by HHS's Substance Abuse and Mental Health Services Administration, creates a new baseline for future national drug use trends. The survey is based on interviews with 68,126 respondents who were interviewed in their homes. The interviews represent 98 percent of the U.S. population age 12 and older. Not included in the survey are persons in the active military, in prisons, or other institutionalized populations, or who are homeless. Findings from the 2002 National Survey on Drug Use and Health are available online at [www.DrugAbuseStatistics.samhsa.gov](http://www.DrugAbuseStatistics.samhsa.gov).

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