

## Inhalants

Inhalants are breathable chemical vapors that produce psychoactive (mind-altering) effects. A variety of products common 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.

Inhalants fall into the following categories:

### **Volatile 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

### **Aerosols**

- *Household aerosol propellants* and associated solvents in items such as spray paints, hair or deodorant sprays, fabric protector sprays,

aerosol computer cleaning products, and vegetable oil sprays

### **Gases**

- *Gases used in household or commercial products*, including butane lighters and propane tanks, whipping cream aerosols or dispensers (whippets), and refrigerant gases
- *Medical anesthetic gases*, such as ether, chloroform, halothane, and nitrous oxide ("laughing gas")

### **Nitrites**

- *Organic nitrites* are volatiles that include cyclohexyl, butyl, and amyl nitrites, commonly known as "poppers." Amyl nitrite is still used in certain diagnostic medical procedures. Volatile nitrites are often sold in small brown bottles labeled as "video head cleaner," "room odorizer," "leather cleaner," or "liquid aroma."

### **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 in sufficient concentrations, inhalants can cause intoxication, usually lasting only a few minutes.

However, sometimes users extend this effect for several hours by breathing in inhalants repeatedly. Initially, users may feel slightly stimulated. Repeated 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 repeated inhalations. 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 a 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 (dry-cleaning chemicals, correction fluids)
- Peripheral neuropathies, or limb spasms—hexane (glues, gasoline) and nitrous oxide (whipped cream dispensers, 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)

## **Extent of Use** ———

Initial use of inhalants often starts early. Some young people may use inhalants as an easily 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.

## **Monitoring the Future (MTF)\* Survey**

According to the 2005 Monitoring the Future survey, lifetime use of inhalants measured 17.1 percent among 8th-graders, 13.1 percent among 10th grade students, and 11.4 percent among 12th-graders in 2005.

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

The 2003 Drug Abuse Warning Network Interim Report estimates 627,923 drug-related emergency department visits for the 3rd and 4th quarters of 2003. Inhalants were attributed to 1,681 of these reported visits.

## **2004 National Survey on Drug Use and Health (NSDUH)\*\*\***

Among youths age 12 to 17, 10.6 percent were current illicit drug users in 2004, and 1.2 percent of those reported current inhalant use. Among 12- or 13-year-olds, 1.2 percent reported current inhalant use; 1.6 percent of 14- or 15-year-olds reported current use.

Lifetime use of inhalants was down in 2004 among Americans in the 18–20 age group. While declines were reported also for lifetime use among Asians age 18–25, their past-month use of inhalants rose significantly. Past-year use rose significantly among 21 year-olds in 2004.

In 2004, the number of new inhalant users was about 857,000.

## **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")
- *Community Drug Alert Bulletin—Inhalants*

\* These data are from the 2005 Monitoring the Future Survey, funded by the National Institute on Drug Abuse, National Institutes of Health, DHHS, and conducted annually by the University of Michigan's Institute for Social Research. The survey has tracked 12th-graders' illicit drug use and related attitudes since 1975; in 1991, 8th- and 10th-graders were added to the study. The latest data are online at [www.drugabuse.gov](http://www.drugabuse.gov).

\*\* These data are from the annual Drug Abuse Warning Network, funded by the Substance Abuse and Mental Health Services Administration, DHHS. The survey provides information about emergency department visits that are induced by or related to the use of an illicit drug or the nonmedical use of a legal drug. The latest data are available at 800-729-6686 or online at [www.samhsa.gov](http://www.samhsa.gov).

\*\*\* NSDUH (formerly known as the National Household Survey on Drug Abuse) is an annual survey of Americans age 12 and older conducted by the Substance Abuse and Mental Health Services Administration. Copies of the latest survey are available at [www.samhsa.gov](http://www.samhsa.gov) and from the National Clearinghouse for Alcohol and Drug Information at 800-729-6686.



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