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ALASKA COUNCIL ON PREVENTION OF ALCOHOL AND DRUG ABUSE, INC.

March 5, 1990

Dear Interested Reader:

"Inhalant use by high school seniors has increased steadily at a time that most other drug use has declined. Annual inhalant use, for example, increased from 4.3 percent in 1983 to 6.9 percent in 1987."

This statement from the National Institute on Drug Abuse points out an increasing, although somewhat unrecognized emerging problem of drug abuse among our nation's youth. In Alaska, the statistics are even more alarming. A University of Alaska study which surveyed statewide drug use among students in grades 7 through 12 found that 16.5 percent of all students had used inhalants in 1983. In 1988, the figure had risen to 25.9 percent, more than 3.7 times the national average, and an increase of 9.4 percent over the past five years statewide! These figures are particularly distressing when one considers that they do not include statistics for youth who are no longer in school. Research confirms a high drop-out rate for drug-abusing students; the rate may be even higher for those involved in inhalant use.

I have enclosed a paper prepared by our Resource Analyst, Lisa Pieper. "Hot off the press", this research based paper is concisely written in layman terms and is intended for the general public. This document is available for distribution through our Resource Library. We are currently compiling a mailing list specifically for this paper which will include school districts, Native corporations, health aides, village health clinics, and of course, all State Office of Alcoholism and Drug Abuse funded agencies.

Sincerely,

Bette O'Moor
Executive Director

Enclosure

BOM:kb



A United Way Agency

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INHALANTS: AN OVERVIEW

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INHALANTS - AN OVERVIEW

The problem of inhalant abuse has been recorded in literature worldwide, and in research reports from Mexico, Canada, the United States, Japan, England, Sweden, Norway and Germany. Reports of the use of inhalants date back to the early 1800's when nitrous oxide, ether and chloroform were first used as intoxicants. Since the early 1960's, reported use of inhalants has spread to the use of gasoline, paint thinners, nail polish remover, spray paints, and numerous other toxic substances containing various chemical compounds, the most popular of which contain the chemicals benzene and toluene.

As recently as ten years ago, the use of inhalants, while recognized as a harmful means of chemical euphoria, was not associated with a drug-using subculture. Most use was thought to be experimental and within isolated groups of youth. Distribution was considered to be not-for-profit and there was no knowledge of ritual or jargon connected with use. Today, this is not the case. A recent report in the Chicago Tribune indicates that the "tolley" (toluene) problem has reached epidemic proportions in parts of the United States. "Pushers" buy toluene in the form of paint thinner and sell small amounts in dollar-sized bottles to kids on the street, netting a profit of up to \$150 from a can bought for \$10.¹ "Tolley" and various other forms of inhalants are now known as "kids drugs". Use is often not recognized by parents and police until youth become involved in the criminal justice system and juvenile courts.

I. PHYSICAL EFFECTS

The inhalation of toxic substances through the lungs carries chemicals via the bloodstream directly to the brain, producing an almost immediate sensation of excitation or euphoria. Chemicals contained in most inhaled substances are lipid (fat) soluble and are stored in the brain, central nervous system, reproductive organs, lungs, kidneys, liver, and bone marrow.

Five types of substances account for approximately 92 percent of all common inhalants. In a survey done in 1989 by Beauvais and Oetting, Native American youth reported that their choice of inhalants is based on availability, with the following substances listed in order of prevalence: gasoline, glue, paint and polish removers, aerosols, and shoe and fingernail polish. Each of these substances consist of complex chemical compounds which contain toluene, benzene, acetone, and/or naphtha. These euphoria-producing chemicals act primarily as central nervous system depressants, impairing membrane permeability and neurotransmission. Freon, a propellant contained in aerosols, may cause extensive tissue damage due to freezing. Aerosol pan coating can cover the

¹ "Tolley Imperils Uptown Youths" *Chicago Tribune*, September 10, 1989, Section 1, p. 24.

lungs with an oil-based substance, cutting off oxygen absorption into the blood. Benzene may be harmful to the blood-producing elements in the body and is believed to cause chromosomal damage and leukemia in humans. Lead from gasoline cannot be detoxified and may be stored asymptotically in the body for long periods of time and then suddenly cause serious illness. Slow, but definite damage to the brain is irreversible.

Additional risks associated with inhalant use are numerous. About half of all chronic sniffers are found to have some form of chronic brain deficit.² Hepatitis, liver damage, muscular weakness, and sleep disorders are also reported. The reversibility of injury to internal organs is not yet known. Sudden Sniffing Death Syndrome (SSDS), in which hydrocarbons over-stimulate the heart muscle, causing it to beat very fast and irregularly and then stop, can occur. Death has also been caused by aspiration, fire, suffocation, resultant violent behaviors, damage to vital organs, and lead poisoning.³

II. PREVALENCE

"Inhalant use by high school seniors has increased steadily at a time that most other drug use has declined. Annual inhalant use, for example, increased from 4.3 percent in 1983 to 6.9 percent in 1987."⁴

This statement from the National Institute on Drug Abuse points out an increasing, although somewhat unrecognized emerging problem of drug abuse among our nation's youth. In Alaska, the statistics are even more alarming. A University of Alaska study which surveyed statewide drug use among students in grades 7 through 12 found that 16.5 percent of all students had used inhalants in 1983. In 1988, the figure had risen to 25.9 percent, more than 3.7 times the national average and an increase of 9.4 percent statewide over the past five years!⁵ These figures are particularly distressing when one considers that they do not include statistics for youth who are no longer in school. Research confirms a high drop-out rate for drug-abusing students; the rate may be even higher for those involved with inhalant use.⁶

² Cohen, S., "Inhalants" *Handbook on Drug Abuse*, University of California, Los Angeles, p. 214.

³ Van Duzen, J.; Welty, T., "Gasoline and Solvent Sniffing: A Serious Problem Among Indian Adolescents" 1980.

⁴ Crider, R.A.; Rouse, B., "Inhalant Overview" *Epidemiology of Inhalant Abuse: An Update*, NIDA Research Monograph No. 85, 1988, p. 1.

⁵ Segal, B., "Drug-Taking Behavior Among Alaskan Youth - 1988: A Follow-up Study" Center for Alcohol and Addiction Studies, University of Alaska Anchorage, November 1988, p. 96.

⁶ Novak, A., "The Deliberate Inhalation of Volatile Substances" *Journal of Psychedelic Drugs*, Vol. 12 (2) April - June 1980, p. 108.

Although the use of inhalants crosses all socioeconomic, geographic, and racial boundaries, it has long been associated with problems of acculturation, poverty, and social isolation which plague underprivileged minorities. High rates also occur in subcultures where alcohol and other drug abuse is common.⁷ The Minnesota Department of Human Services in December 1988 reported that 83 percent of all inhalant detox admissions involved American Indian youth.⁸ Johnson et.al. (1987) found that in the United States more than 15 percent of all youth will try inhalants. In some populations, such as Barrio-Hispanics and Native Americans living on reservations, more than one-third will try inhalants before the age of 18.⁹ When looking specifically at inhalant use in Native American communities, Barnes (1981) found rates to be lowest in communities which have expanded social assets and widespread acculturation to the white man's lifestyle. Highest rates of use were found in communities which had few social assets and were experiencing rapid change and conflict due to acculturation.¹⁰

III. YOUTH AT RISK

Inhalant abuse is clearly a problem of the young. Reports show that inhalants are the drug used most frequently by Native American youth. Although inhalants are not the first drug of choice for most, youth report that they are readily available and in most areas are not categorized as "illegal". Youth try inhalants at significantly lower ages than they try cigarettes, marijuana, or alcohol. One study found that fifteen percent of all elementary school students (grades 4 to 6) had tried inhalants.¹¹ While the inhalation or sniffing of volatile substances was originally thought to predominantly be a male activity, the gender gap appears to be closing.¹²

Inhalant use is a "peer-originated and peer-perpetuated activity".¹³ Sixty-six to seventy-five percent of inhalant-using youth report initiating

⁷ "Psychological Effects of Inhalant Abuse and Its Interference with Psychotherapy" Miami Indian Health Service, P.O. Box 1498, Miami, Oklahoma 74354.

⁸ "Inhalants: Sniffing for a High" *Impact: A Newsletter of Chemical Health in Minnesota*, Vol. 4, No. 4, Winter 1988-89, p. 2.

⁹ Octting, E.R.; Edwards, R.W.; Beauvais, F., "Social and Psychological Factors Underlying Inhalant Abuse" *Epidemiology of Inhalant Abuse: An Update*, NIDA Research Monograph No. 85, 1988, p. 177.

¹⁰ Smart, R., "Inhalant Use and Abuse in Canada" *Epidemiology of Inhalant Abuse: An Update*, NIDA Research Monograph No. 85, 1988, pp. 132-133.

¹¹ Beauvais, F; Octting E.R., "Indian Youth and Inhalants: An Update" *Epidemiology of Inhalant Abuse: An Update*, NIDA Research Monograph No. 85, 1988, p. 41.

¹² Cohen, S., loc. cit. p.213

¹³ Cohen, S., op. cit. p. 213.

use at the invitation of a friend or relative. In one survey, youth reported being encouraged by friends to use inhalants more frequently than any other drug.¹⁴ A high percentage of users also report that their friends and/or siblings currently use. Oetting and Beauvais conclude that any attack on the problem of young inhalant use must take peer clusters into account if it is to be successful.¹⁵

The problem of youth-at-risk for inhalant abuse is further heightened by indications that young people who begin using solvents may be more likely to be involved in other drug abuse. One study found that youth who began using solvents were as likely to become involved with other drugs as those whose first drug of use was marijuana.¹⁶ Other reports show that young adolescents continue to use inhalants while adding other drugs. If inhalant use drops off, the high level of personal problems and early drug experience often leads to the abuse of a variety of other drugs. In any case, the early use of inhalants as a recreational activity certainly points to dangers of deepening drug involvement in subsequent years.

Unfortunately, as the aforementioned research suggests, and state statistics conclude, Alaskan youth are at extremely high risk for inhalant use. Alaskan youth live in areas which are socially isolated, which are experiencing rapid cultural change, and in which alcohol and other drug use is common. In addition to the socio-cultural and economic factors which place Alaskan youth at risk for inhalant abuse, these children live in rural communities where many inhalants are readily available. Because all-terrain vehicles and motor boats are common means of transportation, most families store gasoline drums just outside their homes. Recently reported inhalant abuse deaths in the state include one describing, a youth who had been seen with his head over the gas tank of the family boat engine. He was later found drowned in a river near his village.

IV. SYMPTOMS

A. Physical Signs of Use

The immediate effects of solvent and aerosol inhalation may last from 5 to 45 minutes after cessation. Users report feelings of excitation, euphoria and omnipotence, blurring of vision, irregular heartbeats, numbness, weightlessness, and a distortion of time and space. The intensity of effects ranges from mild intoxication to unconsciousness, there

¹⁴ Sharp, C; Carroll, L., "Inhalant Abuse Among Pueblo Tribes of New Mexico" *Voluntary Inhalation of Industrial Solvents*, National Institute of Drug Abuse, Rockville, MD.

¹⁵ Oetting, E.R.; Edwards, R.W.; Beauvais, F., loc. cit. p. 185.

¹⁶ Frank, B.; Marek, R.; and Schmeidler, J., "The Continuing Problem of Youthful Solvent Abuse in New York State" *Epidemiology of Inhalant Abuse: Update*, NIDA Research Monograph No. 85, 1988, pp. 92-93.

may be partial or total amnesia. Tolerance may develop, resulting in the use of increasing amounts to achieve the desired effects.

Teary, glazed, or reddened eyes are symptomatic of persons who are using inhalants. They may also exhibit slurred speech, frequent cough, weight loss, loss of muscle coordination, unsteady gait, and erratic or "spacey" behavior. Unpleasant chemical breath may be accompanied by a rash or ulcers around the mouth and nose. Users report nausea, headache, nosebleeds, eye irritation, increased light sensitivity, double vision, and ringing in the ears.¹⁷ Physical dangers and symptoms increase with frequency of use and can end in hospitalization, coma, and even death.

B. Psychological Symptoms

The use of inhalants has been closely associated with depression. In a study by Allan and Ghodse, 70 percent of solvent abusers surveyed reported that they used inhalants because they were depressed.¹⁸ Inhalant users exhibit high levels of anxiety, psychopathology, depression, and suicide, and report feelings of anger and alienation. As with most youth involved with drugs, inhalant users tend to have low self-esteem and do not access traditional sources of help. Psychological and social development is arrested at the time that drug use begins.

It has been suggested that the use of inhalants by young people may provide strong feelings of power and influence which might otherwise be lacking in their lives.¹⁹ Beauvais poses that the use of inhalants may be an attempt by youth to reduce the stress provoked by rapid culture change (culture shock).²⁰

C. Sociological Effects/Symptoms

Research shows a high correlation between inhalant abuse and crime. Youth who are involved in inhalant use are known to show high rates of truancy, decreased scholastic performance, and negative interactions with school authorities. Many drop out of school completely. Most become loners and are excluded from the activities of their non-sniffing peers. Signs of use include: loss of interest in personal appearance, food, and family; cleaning rags in the bedroom, closet or

¹⁷ "Inhalants" National Native Association of Treatment Directors, P.O. Box 1882, Saskatoon, Saskatchewan, S7K3SZ

¹⁸ Jacobs, A.; Ghodse, A., "Depression In Solvent Abusers" *Social Science Medicine*, Vol. 24, No. 10, 1987, pp. 864-865.

¹⁹ White, K., "Handbook on Solvent Abuse" Project Solvabuse, Indian and Inuit Health Services, Medical Services Branch, Canada, p. 4.

²⁰ Beauvais, F., "Social and Psychological Characteristics of Inhalant Abusers" *Paper Presented at the World Health Organization Group Meeting on Adverse Effects of Volatile Substances/Inhalants*, Mexico City, April 1986.

basement; dried paint on clothing or body; and empty spray cans or tubes of glue in and around living areas.

V. TREATMENT

Research indicates that few people in the health care system have a clear or systematic applied concept of the nature of the inhalant abuse problem.²¹ There are few models available for the treatment of young inhalant users. The multiplicity of problems surrounding these youth make them difficult to fit into existing programs. Most youth come to treatment as referrals from the criminal justice system, and without family assistance and support. Many have histories of unsatisfactory encounters with helping professionals which have led to distrust and apathy. Most have been involved in inhalant abuse for two to three years prior to entering treatment. Although few enter treatment voluntarily, most do not stop using without professional assistance. The rate at which inhalant abusers drop out of treatment is higher than that of other drug abusers. In addition, inhalant users are asked to leave treatment settings due to rule infractions at twice the rate of other addicts.²²

Inhalant abusers appear to be less verbal and to suffer more severe psychological impairment than other addicts.²³ These youth have low self-esteem and are either very withdrawn, or uncooperative and disruptive in treatment settings. Research indicates that inhalant users have less ego strength than most addicts, possibly due to the fact that even among drug-using subcultures, the use of inhalants carries a negative social stigma as being "low class" or "kids' stuff." As stated previously, young inhalant users have high levels of psychopathology, depression, suicide, and anxiety and may require more intensive care than other addicts. Physiological difficulties affecting treatment include: memory lapse, confusion, depression, tremors, nausea, psycho-motor dysfunction, disorientation, and joint and muscle pain.

Pilot research suggests that the cognitive demands of most treatment settings are beyond the grasp of many inhalant abusers.²⁴ For these clients, the ability to keep appointments, tolerate the treatment environment, and establish basic trust are major undertakings. Inhalant users appear to be unmotivated and "test" staff intensely. Treatment is best targeted to disruptive youth, allowing for greater individualized attention and support. Behavior-oriented strategies with positive reinforcement of even small

21 Mason, T., "Inhalant Abuse and Treatment" University of Houston, U.S. Department of H.E.W., 1979, p. 53.

22 Mason, T., op.cit. p. 43.

23 McSherry, T., "Program Experience With The Solvent Abuser in Philadelphia" *Epidemiology of Inhalant Abuse: An Update*, NIDA Research Monograph No. 85, 1988, p. 115.

24 McSherry, T., op.cit. p.118.

demonstrations of appropriate behavior are warranted. Successful designs focus on basic living skills such as socialization, personal hygiene, verbal communication, and simple self disclosure. Structured and unstructured recreational activities can assist in the rehabilitation of psychomotor activities and the learning of appropriate interpersonal skills. The use of peer leaders and counselors appears to be effective, along with the assignment of special responsibilities to increase personal power. To assess possible nervous system impairment, it is suggested that inhalant abusers receive complete psychological and physical exams upon entering treatment.

VI. PREVENTION

As is true of prevention strategies for any type of drug abuse, strategies for the prevention of inhalant abuse must be comprehensive with multiple points of entry. The most successful self-regulating designs appear to be educational campaigns.²⁵ Because predisposing factors are in place by 4th and 5th grades, prevention education must begin early. Since friends and siblings provide access and instruction for inhalant use, the involvement of "peer clusters" in the design, implementation, and delivery of services is important. Inhalant users tend to be more socially isolated and alienated than other youth, making community education, socialization, and basic life skills important aspects of prevention programming. Outreach must go beyond the school and into the community.

Effective and comprehensive prevention efforts must couple educational programming with sociological and legislative change and public awareness. The alarming rate of inhalant use among Alaskan youth was recognized by the Alaska State Legislature in 1989. Senate Resolution No. 18 expanded the responsibilities of the State Office of Alcohol and Drug Abuse to include prevention, education and treatment of inhalant abusers. Federally, the Toxic Substance Control Act of 1976, administered by the Environmental Protection Agency, contains provisions for the regulation and possible banning of products containing toxic substances which are found to be unreasonable health risks. Legislation also mandates a limit to the amount of lead which can be contained in gasoline to diminish toxicity which can lead to lead poisoning. The amount of benzene in gasoline is considered such a hazard to health that the Occupational Safety and Health Administration set standards for the amount of gas fumes to which workers can be exposed. Environmental concerns about aerosols interfering with the ozone layer in the troposphere have resulted in a reduction in the use of freon as a propellant. Since chemical inhalants are not covered under the Comprehensive Drug Abuse Prevention and Control Act of 1970, there are no federal penalties for the possession or sale of these products. Thirty-one states have passed laws

²⁵ Kerner, K., "Current Topics In Inhalant Abuse" *Epidemiology of Inhalant Abuse: An Update*, NIDA Research Monograph No. 85, 1988, p. 21.

prohibiting the sniffing of volatile substances. Infractions are generally considered misdemeanors and are punishable by a minor jail sentence or fine. Some states include penalties under laws such as those for public drunkenness.

Legislation, however, is only one aspect of the number of sociological strategies which can be employed to combat and to prevent inhalant use. Community education is vital. Since the choice to use inhalants is largely based on availability, owners of retail outlets must be informed and educated about the patterns of use. Communities can make local decisions to limit or ban the sale of certain products to minors or to keep toxic substances safely behind cashier counters. Rural communities can take actions which result in the safe storage of toxic substances, including locks on gas tanks and fuel drums. We need to educate each other about the warning signs of inhalant abuse so tragedies resulting in death and disability can be avoided. We must raise our awareness about this growing problem among youth and offer safe recreational opportunities, support groups, counseling, and education to high-risk youth. Above all, we must learn to "tune in" to our youth and give them direction for the healthy resolution of their conflicts and fears.

The problem of inhalant use, like other forms of drug abuse, cannot be solved using a single strategy. Awareness, education, regulation, healthy alternatives for youth, and safe storage of toxic substances are all necessary. Likewise, all segments of a population/community must work together to bring change. What we do does count! We can make a difference!

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