

Inhalant Abuse and Dextromethorphan



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KEYWORDS

• Inhalant abuse • Epidemiology • Detection

KEY POINTS

- Inhalant abuse is difficult to detect and crosses demographic variables.
- Inhalant abuse is associated with significant morbidity.
- Abuse occurs with readily available household substances.
- Inhalant abuse is mostly associated with younger populations and generally fades out by the end of high school.
- “Over-the-counter” products such as dextromethorphan are sought by youth for abuse purposes.

INTRODUCTION

Compared with alcohol, marijuana, and virtually every other abused substance, inhalant use is a low-frequency occurrence for youth. Nonetheless, it poses a disproportionately serious health problem for this patient population. The relatively heightened concern for inhalant abuse rests, in part, on the socially isolative, hidden nature of its use. Along with inhalants (which primarily are legal substances found in households), dextromethorphan (DM), an ingredient in nonprescription cold remedies, is likely the most commonly used dissociative agent among youth. To appreciate the range of health risks of these substances, consider these 5 brief clinical vignettes:

- An 8-year-old boy is brought to his pediatrician after being found at home unconscious. A syncope evaluation was negative; however, a toluene-based solvent was found open in his bedroom.
- A 12-year-old girl raises concerns at school when her teacher notes a perioral rash, tell-tale stigmata of “bagging,” inhaling paint or other volatile fumes from a plastic bag.

Disclosure Statement: The authors have no conflicts of interest.

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Child Adolesc Psychiatric Clin N Am 25 (2016) 497–508

<http://dx.doi.org/10.1016/j.chc.2016.03.007>

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- A 14-year-old boy, coming in from the barn, is noted by his grandfather to have clothing that smells like gasoline (unclear if he was alone or with friends).
- A young coworker has had a decline in productivity and has quit socializing after work. She takes frequent breaks during the day and seems irritable and anxious. She was observed purchasing a large quantity of aerosolized computer duster spray.
- A 15-year-old boy is brought to the emergency room from school, actively hallucinating. Physical examination was pertinent for significant hypertension, and in his pants pocket, multiple empty bubble pill sheets of Coricidin were found.

The rate of inhalant abuse among children and young adults has sustained a very promising decline in the last 2 decades. In the US National Institutes of Health (NIH) National Youth Risk Behavior Survey (YRBS) for high school students, student reporting of using an inhalant to get “high” at least one time in their life decreased from 20.3% in 1995 to 8.9% in 2013.¹ Nonetheless, inhalant use remains a very dangerous activity affecting a surprisingly young demographic. It is a daunting task for counselors, teachers, families, and health care practitioners to stay alert to the risks of inhalant abuse given the broad and ever-evolving array of household substances that are often used surreptitiously.

TYPES OF SUBSTANCES AND PRODUCTS ABUSED

The term “inhalant” encompasses a wide range of pharmacologically diverse substances that readily vaporize. More than 200 different inhalant product categories were reported to US poison control centers in 1993 to 2008.² Inhalants can be divided into 3 groups (**Table 1**) based on pharmacologic effects. The most commonly abused inhalants are group I, aliphatic, aromatic, or halogenated hydrocarbons (including propellants). Group II are gases (including those typically used in medical settings) and other aerosols. Group III alkyl nitrites have dropped considerably in popularity. Of the above-mentioned inhalants, only propellants (most commonly now is computer duster spray) have shown a substantial increase in abuse since the early 2000s. In contrast, gasoline and paint inhalation have significantly declined, but are still responsible for greater than 50% of inhalant-related poison control cases in children 6 to 7 years old.² Overall, patterns of inhalant use vary widely across the middle childhood

Table 1	
Pharmacologic classification of inhalants: chemical content of product examples	
Group I	Volatile solvents, fuels, and anesthetics <ul style="list-style-type: none"> • Solvents: toluene, acetone, methylene chloride, ethyl acetate, trichloroethane, tetrachloroethylene, hexane, hydrocarbons (eg, paint thinner, polish remover, correction fluid, felt-tip markers, glues, cleaning fluids, spray paint, hairspray, computer/electronics cleaning [duster] spray) • Fuels: butane or propane lighters or pressurized fuel tanks, gasoline, racing car octane boosters, refrigerants • Anesthetics: ether, halothane, enflurane, ethyl chloride
Group II	Nitrous oxide: diverted medical anesthetic, whipped-cream dispenser charger (whippets), whipping-cream aerosol
Group III	Volatile alkyl nitrites: chlorohexyl nitrite (eg, liquid aroma/liquid incense air fresheners or room odorizers), isobutyl or butyl nitrite, isopropyl nitrite

Adapted from Williams JF, Storck M. Inhalant abuse. *Pediatrics* 2007;119(5):1010; with permission.

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