

EM CASE OF THE MONTH

BROWARD HEALTH MEDICAL CENTER DEPARTMENT OF EMERGENCY MEDICINE



Huffing is the intentional inhalation of chemical vapors to attain a euphoric effect. This can include “sniffing” and “bagging”. Bagging (inhaling the substance from a bag) is the most dangerous practice as the patient may become anoxic.

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EM Case of the Month is a monthly “pop quiz” for ED staff. The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.



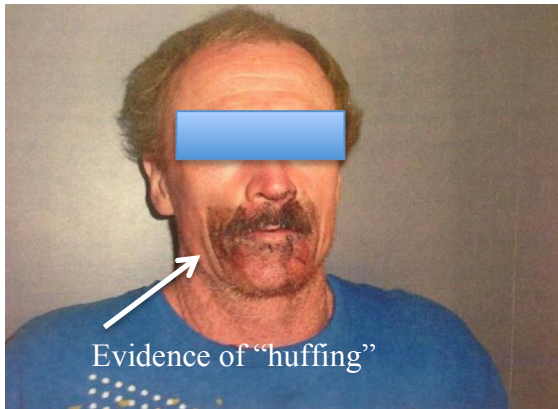
Inhalant Abuse (aka “Huffing”)

A 14 year old girl presents to the ED after huffing fumes from a can of computer cleaning spray. The parents state that there were no warning signs and no hints that she was experimenting with this practice. The first and only clue was when they found the honor student pulseless in her bedroom with the can of inhalant next to her. Which of the following statements about inhalant abuse is true?

- Inhalants can be detected by a simple lab test.
- If the patient arrives in the ED alive, they will usually survive.
- Amiodorone is the treatment of choice for huffing-induced ventricular tachycardia.
- The mechanism of death is uniformly asphyxia.
- Huffing does not cause cardiac arrest. The clinician should seek another cause for the cardiac arrest.



Broward Health Medical Center
Department of Emergency Medicine
1625 SE 3rd Avenue
Fort Lauderdale, FL 33316



Take Home Points

- The use of inhalants is common in teenagers who frequently are unaware of the dangers of this potentially fatal practice.
- Patients may present obtunded, similar to alcohol intoxication.
- Death can occur from “Sudden Sniffing Death Syndrome” OR asphyxiation from hypoxia or laryngospasm.
- V-tach can occur leading to sudden cardiac death. The use of beta-blockers can be life-saving in these patients.

Please note that this month's case is a true story of the tragic death of 14 year-old honor student Aria Doherty who died at home from huffing. Her story can be found by searching her name in any web search engine.

Inhalant Abuse

The correct answer is B. If a patient dies from the abuse of inhalants, they typically die suddenly prior to arriving to the ED. Therefore, patients that present to the ED alive will typically survive.

Discussion:

Inhalant abuse (commonly called “huffing”) is the intentional inhalation of chemical vapors to attain a mental “high” or euphoric effect. A wide variety of common household products can be abused and sadly most of the abusers are teenagers. A 2010 survey on drug use revealed that 68% of “huffers” are under the age of 18. In a 2011 survey, 1 in 5 of US students had experimented with huffing by the time they reached the 8th grade.

Users inhale the chemical vapors directly from open containers (“sniffing”) or breathe the fumes from rags soaked in chemicals (“huffing”). Some spray the substance directly into the nose or mouth, or pour it onto their collar, sleeves or cuffs and sniff them periodically. In “bagging,” the user may inhale fumes from substances inside a paper or plastic bag. Bagging in a closed area greatly increases the chances of suffocation.

Clinical Effects. Clinical effects of huffing can mimic the effects of alcohol, causing inebriation, impaired judgment, and slurred speech. There are several mechanisms that can lead to sudden death however. The first is called “Sudden Sniffing Death Syndrome”. This is sudden cardiac death thought to be caused by a catecholamine surge. Statistics show that 22% of Sudden Sniffing Deaths are first-time users. They can also die from asphyxiation due to hypoxia and/or hypercarbia. They may also develop laryngospasm as many of these substances come out cold from the canister and can trigger glottic spasm.

Treatment. Treatment includes securing the ABCs. Many of these patients will be obtunded and at risk for aspiration so securing the airway is a high priority. It is important to check a blood glucose and an EKG early in the case. *(cont'd next page)*

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<http://www.BrowardER.com>

and click on the “Conference” link. All are welcome to attend !

If ventricular tachycardia is identified, the treatment is beta-blockers. Why beta-blockers? The arrhythmia is due to overstimulation of the beta-receptors of the heart. Treatment with beta-blockers is very effective and will likely save their life. Propranolol has been used traditionally but many toxicologists recommend an esmolol drip as soon as possible.

If the patient has stable vital signs and no evidence of dysrhythmia, the odds of survival are very high. The inebriation should be treated supportively much like an alcohol intoxication. The clinician should consider other causes of altered mental status such as trauma, infection, or glucose emergencies. Electrolytes should be checked as the commonly abused inhalant toluene can cause a renal tubular acidosis. This can lead to hypokalemia, hypomagnesemia, and a hyperchloremic metabolic acidosis. A chest x-ray should be obtained to rule out aspiration.

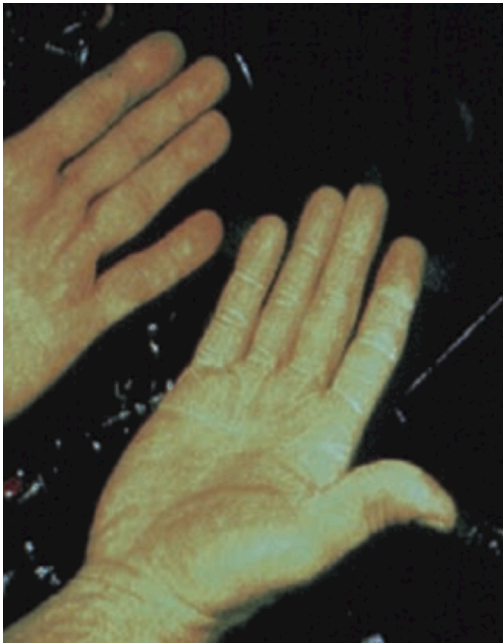


Figure 1: Defatting or drying results when a chemical removes the natural oils from the skin. The most frequent causes of defatted or dry skin are exposures to soaps, solvents, and moisture.

Diagnosis. Patients may present with altered mental status and ventricular dysrhythmias. You may notice defatting (see figure 1) around the mouth and the dominant hand. Family members may report multiple cans or household air fresheners, spray paints, or other substances around the scene.

Disposition. There are no published guidelines on how long these patients need to be observed. Many experts suggest a 4 -6 hour observation period to be sufficient. Patients can be discharged if hemodynamically stable, normal mental status, and no history of arrhythmia.



Figure 2: Hand of a "paint huffer" showing characteristic flecks of spray paint on the digits. (Courtesy of J. Stephen Stapczynski, MD.)