



## Isopropyl Alcohol Swabs as a Preferred Substance of Abuse

Aditi Sharma & Jonathan D. Morrow

To cite this article: Aditi Sharma & Jonathan D. Morrow (2017) Isopropyl Alcohol Swabs as a Preferred Substance of Abuse, *Journal of Psychoactive Drugs*, 49:3, 258-261, DOI: [10.1080/02791072.2017.1290302](https://doi.org/10.1080/02791072.2017.1290302)

To link to this article: <https://doi.org/10.1080/02791072.2017.1290302>



Published online: 26 Feb 2017.



Submit your article to this journal [↗](#)



Article views: 95



View Crossmark data [↗](#)

## Isopropyl Alcohol Swabs as a Preferred Substance of Abuse

Aditi Sharma, M.D.<sup>a</sup> and Jonathan D. Morrow, M.D., Ph.D.<sup>b</sup>

<sup>a</sup>Psychiatry Resident, Department of Psychiatry, University of Michigan, Ann Arbor, MI, USA; <sup>b</sup>Assistant Professor, Department of Psychiatry, University of Michigan, Ann Arbor, MI, USA

### ABSTRACT

The authors describe the treatment of a 36-year-old woman who presented with excessive consumption of antiseptic alcohol swabs. Her behavior was diagnosed as a severe substance use disorder with isopropyl alcohol as the primary drug of choice. Diagnostic and treatment challenges involved in the case are discussed in detail, with particular focus on the differential diagnosis for this unusual presentation, including obsessive compulsive disorder, pica, and intentional self-injurious behavior. A brief review of the literature on non-ethanol ingestion for the purposes of intoxication is included, as well as clinical information about the potential dangers posed by isopropyl alcohol consumption.

### ARTICLE HISTORY

Received 1 April 2016  
Revised 5 December 2016  
Accepted 22 December 2016

### KEYWORDS

Addiction; case report;  
differential diagnosis;  
isopropanol; non-ethanol;  
substance use disorder

There have been a number of reports over the years documenting ingestion of various non-beverage forms of alcohol with the intent to obtain an intoxicant effect (e.g., Emadi and Coberly 2007). These have included ethanol-based hand sanitizer products, various household products, and isopropyl alcohol. Reports of such ingestions are typically cases of overdose in individuals whose access to alcoholic beverages is somehow restricted due, for example, to hospitalization, incarceration, legal age limits for alcohol consumption, or prohibition in certain Native American reservations. One report estimated lifetime prevalence of non-beverage alcohol use at 15–20% among patients hospitalized at a Veterans Administration hospital for alcohol dependence, and prevalence estimates as high as 50% have been reported in prison populations (Drew 1961; Egbert et al. 1985). Such use is almost always driven by a lack of access to alcoholic beverages. There has been at least one case report of a patient with a marked preference for consuming ethanol-based hand sanitizer (Jones, Schuhmann, and El-Mallakh 2013), and one case series published in 1957 that included addiction to isopropyl alcohol (Mendelson et al. 1957). Some individuals in Internet chat rooms report a preference for using isopropyl alcohol, typically in the form of soaking cotton balls and snorting or huffing it (e.g., Rattus 2010). However, this is the first published report of the preferential use of isopropyl alcohol swabs.

### Case presentation

“Ms. T” is a 36-year-old African American mother of three who was followed in an outpatient clinic for almost four years and then was lost to follow-up for about three years. She had a history of major depressive disorder with some self-injury and substance abuse, including alcohol abuse and sniffing of inhalants in her youth. She returned for care with a chief complaint of anxiety and depression, but quickly disclosed that one of her major concerns was her own use of isopropyl alcohol swabs. She did not understand why she used the swabs but felt compelled to suck alcohol swabs on a daily basis. She would suck the liquid out of the swabs and then discard the fabric. This was not a new habit and, in fact, she had been struggling with this behavior for at least four years, as had been documented in her chart.

On mental status exam, her grooming and apparel were appropriate to season and circumstance. Her eye contact was poor and facial expressivity was reduced and delayed. She was generally passive and minimally engaged. Her speech was fluent but slowed and quiet. Her mood was depressed, dysphoric, and sad with restricted affect. Her thoughts were linear, logical, and goal-directed with no evidence of psychosis or unusual preoccupations/obsessions, apart from the alcohol swab consumption. She was fully oriented, and her attention and concentration were within normal limits. Her memory was grossly intact based on evidently good recall of remote, recent, and present history. Her

insight and judgement were somewhat limited overall. Her physical exam was largely unremarkable, with no evidence of cardiomyopathy, telangiectasia, or stigmata of liver disease. Her heart had a regular rate and rhythm with normal S1/S2, no murmurs appreciated, intact distal pulses, and no peripheral edema. Her lungs were clear to auscultation bilaterally without wheezes, rales, or rhonchi. Her abdomen was soft, non-tender, and non-distended. Her neurological exam was normal with no evidence of tremor, weakness, or sensory loss.

The patient said she first became attracted to isopropyl alcohol swabs when she was regularly using them while caring for her child, and she found that she enjoyed their smell. Later, she placed a swab between her lips in order to free up her hands while caring for the child, and found that she enjoyed the taste as well. Her use escalated gradually from that point. At the time of evaluation, she was consuming an average of 150–200 swabs per night. The patient reported that she was not feeling intoxicated when she was sucking on the swabs, but did find it soothing. She denied ever drinking isopropyl alcohol from a bottle. She preferred the taste of BD-brand alcohol swabs, and if she did not find BD swabs at one store she would drive around until she found them. At times, while consuming the swabs, she would feel dizzy, nauseated, and experience a burning sensation in her stomach. She also noted that, every morning, she would feel dizzy, nauseated, and have a headache. She had been told during a visit to the ER for chest pain that her alcohol swab consumption was likely causing cardiac problems (though as far as we are aware isopropyl alcohol has no direct effects on the cardiovascular system that would cause chest pain).

Ms. T would use more swabs when she was feeling stressed. She described part of the appeal of using them as the fact that it was an activity that was uniquely hers, and in some ways it allowed her respite from some of the other responsibilities of her life. At times, she would try to stop using them on her own but was only able to stop for up to six days at a time before relapsing. Notably, several times, the patient starting chewing alcohol swabs during clinical interviews. She was clearly ashamed and verbally expressed that she was embarrassed by her use in the presence of her providers, but she did not stop the behavior.

### Treatment and outcomes

To address her compulsive use of isopropyl alcohol swabs, the patient was encouraged on multiple occasions to enter residential or inpatient treatment. However, the patient declined this recommendation. She was prescribed n-acetylcysteine 1,800 mg daily and naltrexone 50 mg daily for cravings, but she did not take either of these medications, reportedly due to

expense. She also declined recommendations to engage with Alcoholics Anonymous due to embarrassment about the unusual nature of her compulsions.

Ms. T described intermittent suicidal thoughts driven primarily by psychosocial stressors. She was initially prescribed citalopram 10 mg daily, but discontinued due to increased anxiety. Subsequently, she was prescribed venlafaxine, but her adherence was inconsistent. She ultimately discontinued venlafaxine after titrating up to just 75 mg daily. She was also referred to dialectical behavioral group therapy, but she did not follow through with her therapy appointments due to transportation difficulties, embarrassment about her compulsions, child care issues, and possibly ambivalence about her treatment plan.

Screening labs performed by her primary care physician revealed an iron deficiency and mild anemia. This led to a higher suspicion of pica as the etiology for the patient's consumption of alcohol swabs. Ms. T's providers told her that if it indeed were pica, her symptoms would likely improve with over-the-counter iron supplements. However, the patient reported that she was unable to afford the prescribed iron supplements and did not start taking them. Shortly thereafter, the patient stopped coming to her appointments. The Michigan Depression Outreach and Collaborative Care program was able to maintain intermittent telephone contact with her, but she never returned for follow-up with psychiatry or primary care.

### Discussion

Treatment of this patient was challenging for a number of reasons, but perhaps the central challenge for developing a treatment plan was determining the psychological process(es) driving her use of the swabs. Ultimately, her treatment team concluded that her behavior was most consistent with an addiction to isopropyl alcohol as a preferred substance of abuse. Ms. T met several of the DSM-5 criteria for a substance use disorder (American Psychiatric Association 2013). She reported using more of the swabs than intended (criterion 1), endorsed a desire to cut down, and had multiple unsuccessful attempts to quit (criterion 2). She described spending significant amounts of time (criterion 3) trying to procure the specific brand of alcohol swabs that she preferred, reportedly because she did not like the taste of other brands. Although she did not report feeling intoxicated with the use of the alcohol swabs, she described frequent cravings (criterion 4), thus meeting the first four DSM criteria. She was unemployed at the time she was seen in our clinic, but it was not clear whether substance use contributed to her losing her previous job, or whether she neglected any other responsibilities due to her use of alcohol swabs (criterion 5). The patient continued to use the substance

despite self-described feelings of shame and embarrassment that interfered with her social relationships (criterion 6). It was not clear whether she gave up important activities due to use of alcohol swabs (criterion 7). However, she clearly met criteria 8 and 9 due to her continued use of alcohol swabs despite being told by physicians in the emergency room that it could be causing cardiac problems (recurrent use in situations in which it is physically hazardous), as well as the dizziness, nausea, and headaches she experienced while using the swabs (continued use despite knowledge of physical or psychological problems caused or exacerbated by the substance). The patient had, in years past, reported a feeling of intoxication from her consumption of the alcohol swabs, but she denied such an effect more recently, likely due to the development of tolerance (criterion 10). The sensations of dizziness, nausea, and headache she described in the mornings were likely withdrawal phenomena (criterion 11). Thus, this patient met at least 9 of 11 DSM-5 criteria, exceeding the six required for the diagnosis of a severe substance use disorder.

One important differential diagnosis we considered in this case was obsessive-compulsive disorder. This patient's use of alcohol swabs was somewhat stereotyped and ritualized, and her strong preference for a specific brand was particularly striking. After all, if intoxication with alcohol was her goal, ethanol-based beverages were readily available to her, and isopropyl alcohol can be easily obtained in liquid form at any supermarket. However, stereotyped behavior is an important component of all addictive disorders, and marked brand preference is both well-documented and correlated with severity of both nicotine and alcohol use disorders (Casswell and Zhang 1998; Chapman and Fitzgerald 1982). Furthermore, Ms. T said she was unaware that any form of alcohol was in the "baby wipes" she was using, so her pursuit of intoxication with isopropyl alcohol was not simply a consciously chosen alternative to ethyl alcohol. Indeed, considerable clinical and preclinical evidence suggests that addictive behaviors are generally directed more toward cues associated with drugs than toward the drugs themselves (Carter and Tiffany 1999; Robinson and Berridge 2008; Rohsenow et al. 1990). Ms. T did not describe any thoughts driving the compulsion to consume the alcohol swabs, and she did not describe urges to consume the swabs as being related to any "rules that must be applied rigidly" (from DSM 5 criteria for obsessive-compulsive disorder). Her use was often triggered by stress and seemed to relieve tension for her, but again this is a common pattern in substance abuse. Compulsive behaviors are more typically triggered by internal tension as opposed to external stressors. Compulsions are also not associated with cravings, though conceptually distinguishing between "cravings" and "urges" is often difficult. There was no

known history in her childhood of psychotic symptoms or symptoms consistent with either obsessive-compulsive disorder or obsessive-compulsive personality disorder. Finally, it is likely that the anxiety relief the patient obtained from the swabs was due to the physiological effects of isopropyl alcohol, and thus would fall under the DSM-5 exclusionary criterion C for obsessive-compulsive disorder (symptoms must not be the result of another psychiatric disorder, medical condition, or substance abuse).

Another important consideration was intentional self-harm, especially given that this patient had a history of superficially cutting or burning herself when distressed. Isopropyl alcohol reliably produces a burning sensation in the stomach, and the patient was aware that her use of alcohol swabs was often accompanied by headaches, nausea, and dizziness. However, Ms. T complained and worried about these side-effects, and never described them as a desired outcome of her use. Additionally, she explicitly characterized use of the swabs as an alternative to self-injury.

The possibility of pica is somewhat more difficult to exclude in this case. Pica is defined as the persistent consumption of non-nutritive substances. The behavior is typically accompanied by strong cravings for a particular substance, and is often exacerbated by stress. This patient had a childhood history of ingesting unusual, non-nutritive substances such as nail polish and household cleaners at eight years old, which would predispose her to both pica and substance abuse as an adult. She also had an iron deficiency, which is known to increase the incidence of pica. Because she never took her prescribed iron supplements, it is unclear whether her symptoms would have improved with correction of her iron deficiency. However, pica almost always involves eating a solid or semi-solid substance such as dirt, clay, ice, chalk, powdered detergent, or dried paint. Though pica eating is experienced as pleasurable, it rarely, if ever, results in intoxication.

In addition to the potentially devastating psychiatric and behavioral consequences of addiction, some of which Ms. T was already experiencing, it is important to consider the acutely lethal potential of ingesting isopropyl alcohol as compared to similar quantities of ethyl alcohol. Isopropyl alcohol has no uniquely toxic side-effects other than severe gastritis, nor does it have particularly toxic metabolites, but it is a more potent intoxicant than ethanol. The minimum toxic dose is known to vary widely among individuals, but ingestion of as little as 200 mL of isopropyl alcohol can result in death due to depression of the central nervous system and myocardial function (Zaman, Pervez, and Abreo 2002). The manufacturer does not provide volume estimates for the content of their alcohol swabs, but our

own laboratory measurements yielded 0.8 mL of volume at a concentration of 70% V/V, and therefore 0.56 mL of pure isopropyl alcohol per individual swab. Ms. T was using a box of 200 at a time, which would be ~112 mL of isopropyl alcohol per episode of use. Thus, any further escalation of her reported use could put her in acute danger of a lethal overdose. The effects of chronic use of isopropyl alcohol are not known, but would presumably be similar to the many known adverse health consequences of chronic ethanol consumption.

## Conclusions

Isopropyl alcohol is readily available in liquid and swab form at various retailers, and there are no age limits on its purchase. In addition, alcohol swabs are ubiquitously available in health care settings, including hospitals where patients with severe substance use disorders are often treated. It is important for providers to be aware of this potential source of substance abuse and to take appropriate measures to ensure the safety of vulnerable patients.

## Acknowledgments

The authors would like to thank Drs. Srijan Sen, Mahmoud Kamali, and Kevin Kerber, all of whom contributed to the interpretation of the case and commented on early drafts of the manuscript.

## References

- American Psychiatric Association. 2013. *The diagnostic and statistical manual of mental disorders: DSM 5*. Washington, DC: American Psychiatric Association.
- Carter, B. L., and S. T. Tiffany. 1999. Meta-analysis of cue-reactivity in addiction research. *Addiction* 94 (3):327–40. doi:10.1046/j.1360-0443.1999.9433273.x.
- Casswell, S., and J. F. Zhang. 1998. Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: A longitudinal study. *Addiction* 93 (8):1209–17. doi:10.1046/j.1360-0443.1998.93812099.x.
- Chapman, S., and B. Fitzgerald. 1982. Brand preference and advertising recall in adolescent smokers: Some implications for health promotion. *American Journal of Public Health* 72 (5):491–94. doi:10.2105/AJPH.72.5.491.
- Drew, L. R. 1961. Alcoholic offenders in a Victorian prison. *The Medical Journal of Australia* 48 (2):575–78.
- Egbert, A. M., J. S. Reed, B. J. Powell, B. I. Liskow, and B. S. Liese. 1985. Alcoholics who drink mouthwash: The spectrum of nonbeverage alcohol use. *Journal of Studies on Alcohol* 46 (6):473–81. doi:10.15288/jsa.1985.46.473.
- Emadi, A., and L. Coberly. 2007. Intoxication of a hospitalized patient with an isopropanol-based hand sanitizer. *The New England Journal of Medicine* 356 (5):530–31. doi:10.1056/NEJMc063237.
- Jones, R., L. Schuhmann, and R. El-Mallakh. 2013. A patient who prefers to imbibe ethanol-based hand sanitizer over traditional alcoholic beverages. *The American Journal on Addictions* 22 (2):148–49. doi:10.1111/vsu.v22.2.
- Mendelson, J., D. Wexler, P. H. Leiderman, and P. Solomon. 1957. A study of addiction to nonethyl alcohols and other poisonous compounds. *Quarterly Journal of Studies on Alcohol* 18 (4):561–80.
- Rattus [psued]. 2010. Rubbing alcohol [Online forum comment]. Message posted to <http://messageboard.inhalant.org/post/rubbing-alcohol-5028239> (accessed December 29 2015).
- Robinson, T. E., and K. C. Berridge. 2008. The incentive sensitization theory of addiction: Some current issues. *Philosophical Transactions of the Royal Society B: Biological Sciences* 363 (1507):3137–46. doi:10.1098/rstb.2008.0093.
- Rohsenow, D. J., R. S. Niaura, A. R. Childress, D. B. Abrams, and P. M. Monti. 1990. Cue reactivity in addictive behaviors: Theoretical and treatment implications. *International Journal of the Addictions* 25 (7A–8A):957–93. doi:10.3109/10826089109071030.
- Zaman, F., A. Pervez, and K. Abreo. 2002. Isopropyl alcohol intoxication: A diagnostic challenge. *American Journal of Kidney Diseases* 40 (3):E12. doi:10.1053/ajkd.2002.34938.