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Sometimes Poppers Are Not Poppers: Huffing as an Emergent Health Concern among MSM Substance Users

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We are writing to report on a small but possibly growing and worrisome trend among some American men who have sex with men (MSM), which has been reported by participants in the first author's ethnographic study of MSM in Los Angeles.[1] Often described as "a new way to use poppers" or as "huffing poppers," in fact, the practice is simply huffing–that is, inhaling organic solvents or propellants, typically with the use of a rag, a sock or a bag to diffuse or contain the solution for more efficient inhalation. It does not involve conventional poppers, which are based on alkyl nitrites and are inhaled directly from a bottle, typically in smaller amounts. Huffing solvents and propellants carries substantially greater risk both for death and for long-term neurocognitive damage than does the use of nitrite poppers. We are concerned that these products now appear to be marketed towards or used by MSM, who may not recognize the difference between huffing solvents or propellants and the use of alkyl nitrite poppers.

Most addiction textbooks treat nitrite poppers as a marginal footnote in chapters covering other inhalants or so-called "club drugs." This is partly because they have been largely perceived as a niche, gay drug since the end of the Disco era, and partly because their pharmacology was poorly understood before the 1990s (Moncada and Higgs 1993). Consequently, even addiction specialists and LGBT clinicians often have little familiarity with the mechanism of nitrite poppers and tend to assume that they are more or less similar to other inhalants.

"Poppers" originally referred to recreational use of amyl nitrite, a substance that triggers production of nitric oxide (NO) from L-arginine in vascular endothelium and thereby produces a potent vasodilating effect. Medically indicated to treat angina pectoris, it has also been used since at least the 1970s for its mild psychoactive effects and to enhance sexual experience through relaxing smooth muscle. This has become particularly popular among

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MSM. Originally distributed in glass ampules that "popped," it is now commonly sold in small glass bottles under a variety of brand names such as Rush and Jungle Juice. Since the 1980s, amyl nitrite has been restricted to medical uses in the United States and Europe, but a number of related alkyl nitrites continue to be available in legal or semi-legal form: butyl nitrite, isobutyl nitrite, isopropyl nitrite, cyclohexyl nitrite, and others. Many of these compounds are also sold in sex shops and online as "video head cleaners" or "room odorisers."

Use of alkyl nitrites carries some medical risks (Romanelli, et al. 2004). Most common are headaches from the vasodilation or mild chemical burns from the solvent medium. Most significant in a sexual context, phosphodiesterase-5-inhibitors (the class of medications that includes Viagra®) can interact with NO-releasing agents like nitrite poppers to cause substantial vasodilation, leading to serious cardiovascular complications and possibly death (Cheitlin, et al. 1999). In individuals with glucose-6-phosphate dehydrogenase (G6PD) deficiency, alkyl nitrites can trigger a hemolytic anemia. There are also rare reports of visual changes (Audo, et al. 2011). Nonetheless, relative rarity of significant medical consequences has led many MSM to regard the use of poppers as fairly benign, and to disregard occasional statements about them from medical authorities.

To date, use of alkyl nitrites as a psychoactive substance among MSM has received little attention in addiction textbooks, where they are subsumed among other inhalants. This is unfortunate, because lumping these disparate agents together based on mode of administration obscures substantial differences in both mechanism and typical risk between alkyl nitrites, which act on a specific NO pathway, and inhaled solvents and propellants that exert their effect through combinations of mild hypoxia, direct chemical interaction with neuronal membranes, and agonism at various receptors. Moreover, huffing solvents or halogenated alkanes, such as the aerosol propellant ethyl chloride (also known as chloroethane), can induce a rare fatal arrhythmia in some individuals, known as "sudden sniffing death." More common serious side effects include delirium in the short term, as well as potentially permanent impairment in memory and executive functioning, and neuropathy (Tormoehlen, et al. 2014).

It is difficult at this point to estimate the prevalence of this new huffing practice among MSM. Based on discussion with informants in Los Angeles and search of Internet sites, it appears to have been going on for several years but may be increasing. Diligent searches in PubMed and Google have failed to turn up any systematic reporting on the topics of huffing among MSM, in either scholarly journals or the LGBT-oriented press. We have found mentions of the brand name Maximum Impact® (containing ethyl chloride) from at least 2007 in online forums such as Erowid, which chronicles the experiences of users of psychoactive drugs, and from postings in sex-oriented online forums for MSM from 2008. We have found depictions of huffing described as "poppers" in MSM-oriented online pornography from at least 2010.

There is concern that many MSM who are using ethyl chloride and other solvents or propellants under the guise of "poppers" are likely unaware of the health risks involved in huffing. In the United States, huffing has primarily been a practice of adolescents from

lower socioeconomic status backgrounds (Anderson and Loomis 2003), not among gay, male bisexual, or other MSM subcultures. Consequently, American MSM may not recognize huffing for what it is–a serious health threat–but rather falsely identify this new practice as just another form of alkyl nitrite poppers, which it is not. Most gay men who have used poppers think of them as fairly benign, and think of health recommendations against poppers as being overblown. This is particularly true among older gay men who remember the spurious implication of nitrite poppers as causing Kaposi's sarcoma (KS) or the AIDS syndrome itself during the 1980s–in fact, use of poppers likely correlated with high numbers of sexual partners (Vandenbroucke and Pardoel 1989).

There is consequently potential here for gay and bisexual men and other MSM to be introduced through sexual partners to the practice of huffing solvents without quite realizing what they are doing. Conversely, most physicians likely do not realize that huffing organic solvents represents a marked increase in health risks over alkyl nitrite poppers. Clinicians whose patients exhibit potential symptoms of huffing such as cognitive impairment or neuropathy, or whose patients mention using poppers, may be advised to inquire more deeply regarding possible huffing. Furthermore, clinicians working with MSM should become well-versed on the difference between nitrite poppers and propellants or solvents commonly used in huffing, so they can recognize symptoms of use, and inform their patients of the differing health risks.

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