K23 Taking the High Road: A Look at San Diego Auto Accidents Involving Inhalant Abuse

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After attending this presentation, attendees will have a greater knowledge of the toxicology and methodology associated with hydrofluorocarbon analysis as well as the symptoms associated with inhalant abuse, as two case studies will be discussed.

This presentation will impact the forensic science community by illustrating the catastrophic effects of car accidents caused by inhalant abuse and by illustrating the importance of an inhalant method in the laboratory. Included in the discussion will be a look at inhalant abuse demographics with a portion focusing on the prevalence of inhalant abuse in the military. Method creation and validation will also be discussed.

Inhalants can be found everywhere; in schools, homes, offices, bedrooms, garages, and supermarkets. Inhalant abuse is considered the "intentional or deliberate inhalation of chemical vapors to achieve intoxication," and this can be done with any product that produces vapors. According to the U.S. Consumer Product Safety Commission, there are more than 1,000 products that contain dangerous solvents that can be abused. Inhalants are often seen as less harmful when compared to other recreational drugs but often "can result in total unconsciousness and even death the first, tenth, or one-hundredth time." The mechanism of inhalant deaths will be discussed along with the definition of sudden sniffing death and delayed death.

In San Diego City, approximately 62% of the drivers under the legal limit BAC of 0.08 grams % have something other than ethanol in their system; and some of these drivers' test results come back negative for commonly used recreational drugs. Due to the lack of apparent cause of the intoxication, the Forensic Chemistry Unit at the San Diego Police Department was asked to develop and test a method for presumptively identifying commonly abused inhalants (or volatile substances) in blood samples. The method created focuses on hydrofluorocarbons, namely 1,1-Difluoroethane and 1,1,1,2-Tetrafluoroethane, along with Ethylene Dichloride, and Toluene. A need for this kind of analysis became a priority after a 9-year-old girl was fatally killed in a car accident involving a driver who was under the influence of a volatile substance. This case will be discussed in depth during this presentation.

Inhalant intoxication is very similar to alcohol intoxication producing symptoms such as slurred speech, lack of coordination, euphoria, lightheadedness, delusions, and dizziness. Higher levels of intoxication can also produce confusion, nystagmus, and decreased reflexes. In the driving cases used in this study, drivers who were high on volatile substances exhibited many dangerous driving traits such as straddling the center lane, stopping without cause in a traffic lane, braking erratically, as well as accelerating and decelerating rapidly.

Manufacturers have implemented various techniques to deter the abuse of their products; this is referred to as product modification.

Product modification can be done in three ways, by removing the harmful component, by adding a deterrent, or by modifying the package so that it is less likely to be misused. Product modification in the United States, as well as in Australia, will be discussed.

Inhalant Abuse, Toxicology, Driving

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