Unveiling the Hidden Dangers: Heavy Metals in E-Cigarettes and Vapes Raise Concerns for Public Health

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As the age of tobacco-based nicotine products shrinks in the rearview mirror, it comes as no surprise that consumers, young and old, are increasingly being drawn to its modern equivalent: e-cigarettes, also known as vapes. Formally labeled electronic nicotine delivery systems (ENDS), the devices produce an aerosol by heating a liquid that contains nicotine, flavorings and other chemicals that are then inhaled by the user.

Introduced into the North American market in 2007 and approved by the FDA for marketing in 2021, e-cigarettes have been heralded as a safer substitute for traditional tobacco-based products, with some experts (and the FDA) suggesting that they may assist adult users in smoking secession. However, as the products gained popularity, concerns as to the long-term effects of their use have been raised. Beyond the arguable introduction of a new generation to the addictive properties of nicotine, several recent studies indicate the devices contain numerous heavy metals. These toxicants, many of which are known inhalation carcinogens (nickel and chromium) and neurotoxic substances (lead), have been shown to be introduced to the lungs upon use of the device.

In a study, published March 30, 2024, researchers analyzed urine metal levels, specifically cadmium, lead and uranium, in a representative sample of US adolescent e-cigarette users. Their findings, published in the journal Tobacco Control, indicated a correlation between increased vaping use and heightened levels of the heavy metals. However, these findings are not solely attributable to nicotine-based vaping products. On March 19, 2024, researchers presented their findings in relation to cannabis-based vaping products to the American Chemical Society. While additional testing is necessary to determine the magnitude of the metals inhaled upon use, the researchers discovered nano-sized toxic metal particles including lead, nickel, zinc and copper in cannabis vaping liquids, even before they were heated with a vaping device.

While the long-term effects of e-cigarette use/vaping remain to be seen, we quickly approach the 20-year anniversary of their introduction into the American marketplace. In that time, we have seen the notable increased use of both nicotine and cannabis-based vaping products by users of all ages. This research begs the question: is a new wave of 'smoking'-related cancers and diseases on the horizon? And, importantly, what will the legal landscape be when that wave comes?