Alcohol, Drugs & Impairment Division

Alcohol, Drugs and Impairment Division – NATIONAL SAFETY COUNCIL

Position Statement
Vaping Products

Position

The Alcohol, Drugs and Impairment Division (ADID) of the National Safety Council (NSC) supports policies for the implementation of robust strategies to reduce the use of vaping products, with a particular focus on restricting access and usage among individuals under 21 years of age. To address the significant public health concerns associated with vaping, the NSC-ADID recommends a comprehensive, multi-faceted policy approach targeting the following key objectives:

1. **Restrict Youth Access**
2. **Regulate Product Composition**
3. **Strengthen Legislation**
4. **Promote Research and Public Awareness**

Background

Vapes are battery-powered devices that heat a liquid, wax, plant, or other material to generate an aerosol for direct inhalation; devices include e-cigarettes containing nicotine, cannabis-based devices, and products containing herbal or health-related substances. Vapes entered the United States in 2006 as disposable e-cigarettes. By 2018, the U.S. Surgeon General declared vaping an epidemic amongst youth, who are vulnerable to nicotine dependence and other health risks. Vaping has been linked to numerous illnesses, injuries, hospitalizations, and death.

Adverse health effects from vaping products are influenced by several factors: the composition of the formulation (including post-manufacturing alterations by the user), physical device characteristics, chemical changes and additions from heating (e.g., chemical and metal leaching, pyrolytic products, degradation products), health of the user, and use behaviors [1]. User behaviors vary greatly in terms of exposure frequency, inhalation volume, and particle deposition [1]. Continuous product evolution and variation in formulations have prevented timely and robust toxicological studies and hindered longitudinal understanding of both short- and long-term health effects.

ADID Recommendations

1. Restrict Underage Access.

- **Increase Minimum Age for All Vaping Product Sales.** Nicotine and cannabis laws and policies already restrict purchase and use to a minimum 21 years of age. The ADID supports increasing the minimum age for all vaping product sales to 21 years, regardless of ingredients. Vaping products marketed as aromatherapy and flavored air contain ingredients that can lead to lung injury when inhaled and can be refilled with formulations containing nicotine and other drugs.
- **Enhance Age Verification.** Vendors and manufacturers should be subject to stringent oversight and prevented from marketing or selling vaping products to youth. This requires enhanced age verification measures (e.g., required scanning of driver's license) to be adopted by retailers and enforced.
- **Redesign Packaging and Advertisement to Limit Youth Appeal.** Vaping advertisements and social media influencers have saturated the markets, promoting youth appeal. Product package designs, discreet use capabilities, and gamification of devices have also contributed. The ADID urges the redesign of product packaging and advertising to eliminate youth appeal and exposure. It also encourages government regulatory agencies to exercise oversight powers with stronger and consistent enforcement, including the establishment and enforcement of clear standards that limit product and packaging designs that appeal to youth. These standards should be clearly defined, consistently applied, and mandatory for all manufacturers and retailers. The ADID recommends the use of child-resistant packaging for vaping products to prevent accidental exposure.
- **Restrict the Sale of Flavored Vaping Products.** The proliferation of flavored vaping products has been associated with widespread use, particularly by youth. As of November 2025, the FDA has authorized the sale of only 39 e-cigarette products, significantly restricting the flavor profiles legally available to consumers [2]. However, thousands of unregulated vaping products with a wide array of flavor profiles remain accessible in stores and online. The ADID supports enforcing the sale of only FDA-authorized devices in retail outlets, thereby limiting the sale of flavored vaping products, including menthol.

2. Regulate Ingredients and Concentration Limits.

- **Restrict Known Hazard Chemicals in Vape Formulations.** The FDA's updated Harmful and Potentially Harmful Constituents (HPHC) list for vape formulations excludes several chemical compounds referenced in guidance for premarket tobacco product applications [3]. It also omits many formulation chemicals identified as health hazards. The ADID recommends restricting HPHCs, extending the HPHC list to include commonly found harmful chemicals, and supports limiting all chemicals used in formulations to those with established inhalation safety data.
- **Define and Enforce Concentration Limits in Formulations.** More than 25,000 different flavoring chemicals are available for use in vape formulations. Most vape formulations have an average of 10 flavorings [4]. Data have shown that many generally recognized as safe (GRAS) flavoring chemicals are toxic when inhaled, with toxicity increasing as the concentration increases [5,6], or as the number of flavoring chemicals inhaled increases. With thousands of possible flavoring chemicals and millions of possible mixtures at varying concentrations, the determination of the safety data for all vape formulations on the market is challenging. Only products subjected to safety assessments with recommended and established concentrations of ingredients should be permitted for sale.
- **Enforce Complete and Transparent Ingredient Labeling.** All chemicals used in vape formulations must be disclosed to the FDA for product authorization; however, they are not required to be listed on the product labels. For example, most nicotine vapes are labeled with a nicotine concentration and an ingredient list of propylene glycol (PG), vegetable

glycerin (VG), and artificial or natural flavors. This practice enables a lack of transparency by not listing ingredients used to impart the flavor profile. As a result, quality assurance testing to verify product compliance is impossible. Studies have reported that the listed concentrations of nicotine, tetrahydrocannabinol (THC), and other ingredients are often inaccurate and also identified ethanol as an unlisted ingredient [7,8]. All ingredients should be clearly labeled on the vape package.

- **Establish a Quality Assurance Surveillance Program.** Regulated vaping products are required to be quality tested to comply with FDA regulations; however, unregulated products, which are more prevalent in the marketplace, are not subject to such testing. Therefore, reference laboratories should survey both regulated and unregulated vaping products. These laboratories would assess compliance with defined safety thresholds and identify chemical and biological compounds not defined by regulations.

3. Strengthen Legal Oversight.

- **Expand Smoke-Free Policies to Include Vaping Products.** The proliferation of smoke-free policies in public buildings, parks, restaurants, shops, workplaces, and other venues has been instrumental in reducing tobacco consumption and mitigating the risks of exposure to second-hand smoke. The ADID encourages policymakers to expand smoke-free policies to include a prohibition on the use of vaping products in indoor and outdoor public spaces.
- **Extend Cigarette Taxes to Vaping Products.** Federal, state, and local taxes on cigarettes and other tobacco products have been demonstrated to be effective at reducing consumption and discouraging the initiation of use. They are a revenue source that can be used to fund public health, education, and cessation programs [9]. As of June 2024, 20 states do not have an excise or special tax on vaping products [10]. The ADID supports extending these taxes to cover all vaping products in addition to tobacco products.
- **Require State Licensure to Sell Vaping Products.** Any retailer who sells vapes, pre-mixed formulations, formulation components, device replacement parts, and other vaping-related products should be licensed to do so, mirroring requirements for the sale of tobacco. Licensure should require that (1) retailers may only sell FDA-regulated vapes, and (2) a government or state-issued ID must be scanned at the point of sale, similar in practice to the sale of alcoholic beverages. This approach will effectively restrict access for youth, with associated stricter penalties and consequences for selling unlicensed and unregulated products.
- **Eliminate Online Sales of Vaping Products.** While the sale of tobacco products online is not federally prohibited, vaping products sold online enable youth to circumvent barriers to purchase. Online vendors have been identified who sell vaping products to youth and package vaping products within other goods, such as stuffed animals or candy bars [11]. Online sales restrictions will also help reduce the ease of accessing unregulated products, which thrive in online marketplaces.
- **Restrict the Physical Distance of Smoke and Vape Stores to Schools.** Historical internal memos from tobacco companies demonstrate intentionality to market directly to children and young adults [12,13], by establishing proximity to youth. Studies have demonstrated that the frequency and proximity of marketing influences youth decisions [14,15]. Many jurisdictions have implemented a buffer zone of 300, 500, or 1000 feet around schools, churches, and parks where smoke and vape shops cannot operate, thus reducing the density of stores in neighborhoods. The ADID recommends policies defining a minimum distance between venues frequented by children and smoke and vape retail stores.

4. Advance Education and Research.

- **Public Awareness and Education.** A multi-pronged approach to public awareness should be adopted. Effects of nicotine and other known health impacts from vaping should be clearly promulgated to, and within, the public. Clear health warnings should consume significant space on the product packaging. Advertising should only be permitted near the product or point-of-sale, and not be visible from exterior retail areas (e.g., store windows, gas pumps). Additionally, relevant and high-impact, evidence-based educational curricula need to be developed. Age-appropriate, multilingual materials and activities should be distributed in schools, and educational materials should be placed in high-traffic community spaces.
- **Increase Funding for Research.** In contrast to combustible cigarettes and tobacco products, for which decades of research exist, vaping products have significantly less existing research on public health and safety. The ADID recommends increased product surveillance to document alterations to product design, marketing, and chemical formulations. Most importantly, more robust, longitudinal research on the health impacts of vaping should be nationally prioritized, to include a database for tracking vaping-related lung injuries at the national level.
- **Substantially Increase Use of Annual Tobacco Settlement Payments.** Each year, states receive millions of dollars from the Master Settlement Agreement, funded by major tobacco companies, to offset tobacco-related healthcare costs and eliminate youth-targeted marketing. The settlement was “intended to allocate lifesaving tobacco prevention efforts in states” for as long as [tobacco companies] continue to sell cigarettes. The Centers for Disease Control and Prevention (CDC) recommends the funds each state allocate to tobacco prevention and education. According to the American Lung Association, cumulatively, the states only spend approximately 3% of the allocation on these programs [16]. The ADID recommends that every state substantially increase spending on programs to support the prevention and education of smoking and vaping.

Appendix I: Additional Background

The FDA, to date, has authorized the marketing of 39 e-cigarette products from four manufacturers, meaning most products in the U.S. marketplace are not regulated by the FDA.

The liquid formulations used in vaping products are highly variable and often contain regulated (e.g., nicotine), controlled (e.g., THC), or recreational (e.g., caffeine) substances. These substances are typically dissolved in solvents such as PG, VG, or ethanol, and often include added flavorings and sensory agents such as vanillin, ethyl maltol, or menthol. Other common ingredients serve as diluents, preservatives, stabilizers, colorings, or thickeners [4,7]. Given that many flavoring compounds are dissolved in ethanol, inevitably, ethanol is expected in trace concentrations in vaping products. However, some vaping products have been demonstrated to contain as much as 20-30% ethanol [7,17]. Additionally, vape formulations may contain unintended chemicals formed during heating or introduced through leaching of materials, such as metals from the heating coil.

Many vape ingredients are on the FDA's GRAS list [18]. However, the GRAS designation applies solely to substances intended for use as food additives, and it is based on the condition that the substance is 'generally recognized, among qualified experts, as having been adequately shown to be safe under the conditions of its intended use'. This designation does not extend to other routes of administration. Most ingredients in vaping products lack robust, longitudinal data on inhalation toxicology and safety [19]. Most flavoring chemicals identified in vape formulations, while designated as GRAS, are associated with one or more Global Harmonization System hazard class [7].

The FDA justified their recent authorization of menthol-flavored e-cigarette products by stating "benefits to adult smokers from completely switching to a less harmful product was sufficient to outweigh the risks to youth" [20]; however, menthol has been reported to promote nicotine addiction [21], exhibit cytotoxic effects [22], and act as a counterirritant to other inhaled chemicals [23].

Marketing Oversight

The vaping industry uses social media and "influencers" to promote the use and purchase of these products using discreet shipping methods [11]. Product designs have evolved to appease consumer demands and facilitate discreet use. Vaping products that function as music speakers or look like toys are two examples of product designs aimed at targeting youth. A new surge in "gamified" devices emerged in 2024, which include devices that have built-in video games, digital pets (the user must vape to feed the pet), and vaping challenges and incentives [24–26].

Schools within walking distance of smoke and vape shops have a higher prevalence of smoking than those with fewer retailers nearby [14,15]. It is estimated that 77% of public schools are within a 10-minute walk to a tobacco retailer [27]. Some jurisdictions have reported a significant reduction in the density of stores, nearly eliminating race- and income-based disparities between neighborhoods [28,29].

Health Risks

The fundamental principle that the "dose makes the poison" [30] has been modeled for centuries in public health regulations, especially as chemical threshold exposure limits.

The current required warning on FDA-authorized e-cigarette packaging reads: "WARNING: This product contains nicotine. Nicotine is an addictive chemical." [31] This warning is inadequate because it fails to alert users to the increased risk of cardiovascular, respiratory, and gastrointestinal disorders, as well as decreased immune response and reproductive health, and increased tumors [32]. In an effort to improve warning messaging, a U.S. focus-group study tested five types of experimental warning statements addressing toxic ingredients, health

effects, cognitive development, addiction, and unknown risks. Messages highlighting potential impacts on youth cognitive development, memory, and mood were perceived as the most effective deterrents. In contrast, warnings about toxic ingredients and health risks were more influential for adults considering a switch from cigarettes but were less persuasive for youth [31].

E-cigarette or vaping use-associated lung injury (EVALI) was first recognized by the U.S. Centers for Disease Control and Prevention (CDC) in August 2019, and reporting by the CDC stopped on February 18, 2020 [33]. Symptoms included hypoxemia, requiring supplemental oxygen, and indicators of systemic inflammation. Three types of clinical presentations commonly occurred in EVALI cases: “prominent gastrointestinal, general systemic (fever and fatigue), and respiratory symptoms.” Of the 2,668 hospitalized EVALI cases reported to the CDC, where the median patient age was 24 years, 82% reported using a THC-vaping product, and 57% reported nicotine e-cigarette use [34]. The U.S. Department of Defense prohibited sales of vaping products at Army, Air Force, and Navy locations in October 2019 in response to the emergence of EVALI [35,36]. Vitamin E acetate was linked to the EVALI outbreak since it was detected in products analyzed by the FDA and state laboratories, as well as in lung fluid from patients tested by the CDC [34,37]. However, cases of EVALI have been reported in which the individual did not use a product containing Vitamin E acetate [38]. As such, other ingredients cannot be ruled out as contributors to EVALI. There is a necessity to track vaping-related lung injuries at the national level to define the public health risks.

Many adverse reactions have been reported following use of cannabis-based vaping products, often due to inaccurate labeling of concentrations leading to overdose or from ingredients that were not labeled [8].

A study demonstrated that regular vaping product users have significantly reduced heart, lung, and muscle health, and a significant physiological age difference compared to non-users [39]. In 2023, the American Heart Association (AHA) stated, “We do not yet know the long-term health effects of [vaping] products” [33].

Manufacturers of vaping devices have continually evolved the size and operation of the devices since their modern introduction in the U.S in 2007. This evolution “continues to impede timely toxicological studies and hinder progress made toward our understanding of the long-term health consequences of e-cigarettes” [1]. Furthermore, the performance of these products may be altered by the user, providing unknown variability in exposure to toxic compounds [40].

A major concern of vaping product use is the potential to adopt such products for the discreet consumption of controlled and recreational substances. A substance can be added to the vape product formulation and inhaled with no external indicators for the drug being consumed. Such a modification of vape formulations with controlled substances is documented in the literature, and the use of adulterated products has been reported in schools, while driving, at work, and in other public venues [41].

Gaps in Regulations and Research

When e-cigarettes emerged in the U.S. marketplace in 2006, they were not defined as tobacco products. This gap prompted the FDA to develop new language and regulations, called the Deeming Rule, for governing electronic nicotine delivery systems (ENDS). This final rule gave the FDA authority over ENDS, including e-cigarettes. Critics of the implementation of these regulations claim that oversight has been slow and the process is burdensome. Manufacturers of vaping products were to submit Pre-market Tobacco Product Applications by September 2020 for the FDA to consider authorizing their products for sale in the U.S. The FDA reports that the agency received 6.7 million applications from more than 500 companies [42]. Despite the 39 FDA-vaping products, an estimated 6000+ unauthorized devices are purportedly sold in the U.S. marketplace. The FDA has issued warning letters against the manufacture, distribution, marketing, and sales of these devices; however, these warning letters have been widely

ineffective. As of July 2024, only 80 brick-and-mortar retailers had received warnings for selling unauthorized vaping products [43]. These letters have addressed devices that function and resemble smart technology, are promoted at trade shows, and appeal to youth.

In the absence of effective regulatory framework and enforcement, public health and public safety issues have emerged over time. In the vaping product market, this absence has also facilitated rapid product evolution and proliferation that confounds robust research. A review on the toxicity of vaping products found “evidence is still too limited to draw definite conclusions about the potential human health effects of [vaping products]”; however, “there was an agreement among several reviews that the evidence of negative impact on health warrants stronger regulation of [vaping products]” [44].

The gap between regulation and enforcement has precipitated an increasingly complex landscape for research to fully understand the short- and long-term impacts on human health. Studies on the health effects of vaping product use have primarily focused on the acute effects. The long-term consequences of vaping product use will take many years to understand [1,45].

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