Senator Charles E. Grassley Questions for the Record
United States Senate Committee on the Judiciary
Combatting the Youth Vaping Epidemic by Enhancing Enforcement Against Illegal E-Cigarettes
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Questions for Susan Walley, MD, MHCM, NCNTT, FAAP
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1. There's an abundance of THC vapor products used by teenagers and children. Can you please elaborate on the negative impacts of THC vapor products on adolescent health?

There are multiple health harms of adolescent e-cigarette/vapor product use that have been documented. Vape products are known to contain many of the same harmful toxins as combusted tobacco products (i.e. cigarettes, cigars); this raises concern that over decades of use, youth that use vape products may suffer the same consequences of combusted tobacco users, which include 12 different cancers, cardiovascular health effects such as heart attacks and strokes, and chronic respiratory issues such as chronic obstructive pulmonary disease (COPD). There is significant co-use of tetrahydrocannabinol (THC) with nicotine, often unknown to the user.[1] This co-use makes it difficult to assess the health harms of THC vapor products independent of nicotine, and thus there is limited data on sole THC vapor product use.

Short and long-term health concerns of vapor product/e-cigarette use on adolescents include:

a. **Addiction.** Adolescents are uniquely susceptible to nicotine addiction as the brain is not fully mature until age 25 years. In addition, animal models demonstrate that early nicotine exposure can cause permanent brain cell changes.[2] THC is also well documented to result in addiction.[1]
b. **Progression to combusted tobacco and illicit substance use.** Several longitudinal studies have demonstrated that adolescents that use e-cigarettes are more likely to progress to combusted tobacco use.[3] In addition, e-cigarette use is associated with co-use of nicotine with other harmful substances to the developing brain and body including THC.[4,5] THC has been linked to progression of use to other illegal drug use, including prescription opioid use, cocaine, and injection drugs.[1]
c. **Neurologic health effects.** Adolescents who use e-cigarettes have a higher rate of mental health disorders such as anxiety and depression.[6] The use of THC at any age is known to result in poor concentration, psychosis, and in adolescence has been associated with lower neurocognitive function, psychosis, and distorted perception. Adolescent use of THC use has been associated with lower neurocognitive function, increased suicide attempts, and development of psychosis.[1]
d. **Respiratory health effects.** In the summer of 2019, the first reports of E-cigarette or Vaping Associated Lung Injury (EVALI) were publicized and ultimately, caused

hundreds of hospitalizations and dozens of deaths.[7] In addition to EVALI, e-cigarette use is known to cause negative respiratory effects including coughing, wheezing, and worsening of asthma.[8]

e. **Cardiovascular health effects.** The ultrafine particles present in e-cigarette aerosol (commonly known as vapor) can cause endothelial dysfunction, particularly when used chronically.[9] This is a similar mechanism of injury that causes heart attacks, strokes, and other vascular disease from combusted tobacco use.[10]

f. **Cancer Risk.** E-cigarette and vapor product use exposes users to carcinogenic substances such as formaldehyde, acrolein, and acetaldehyde that are found in combusted tobacco. There are significant concerns that adolescents who use vapor products are being exposed to these carcinogens.[11]

g. **Metal and Other Toxin Exposure.** Many of the e-cigarette and vapor products that are sold and advertised to youth are not authorized by the FDA. Youth that vape have been identified as having higher levels of metal exposure, including lead and uranium.[12]

h. **Secondhand Aerosol Exposure.** Secondhand aerosol exposes (similar to cigarette secondhand smoke) those who are not vaping to toxins and harmful chemicals. Secondhand aerosol exposure has been associated with shortness of breath and bronchitic symptoms.[13]

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