

Analysis reveals increasing addiction and intensity of e-cigarette use by US adolescents

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A new analysis published in *JAMA Network Open* by investigators at Massachusetts General Hospital (MGH) in collaboration with a retired UCSF professor reveals ongoing and worsening adolescent e-cigarette

addiction in the United States.

In the analysis of data from the annual National Youth Tobacco Survey, a nationally-representative survey of middle and [high school students](#) in grades 6-12, researchers found that e-cigarette prevalence among youth peaked in 2019 and then declined, but e-cigarette initiation age dropped between 2014 and 2021, and intensity of use and [addiction](#) increased after the introduction of protonated nicotine products

Protonated nicotine is created by adding acid to the e-cigarette liquid, which makes the nicotine easier to inhale. Since Juul pioneered protonated nicotine, it has been widely adopted by other e-cigarette companies.

Age at first use of e-cigarettes fell by 1.9 months per year, while age at first use of cigarettes, cigars, and smokeless [tobacco](#) did not change significantly. By 2017, e-cigarettes had become the most common first tobacco product used.

E-cigarette nicotine addiction, measured as the odds of use within 5 minutes of waking, an indicator of addiction, increased over time. By 2019 more youth e-cigarette users were using their first tobacco product within 5 minutes of waking than for cigarettes and all other products combined. The percent of sole [e-cigarette users](#) who used e-cigarettes within 5 minutes of waking was around 1% through 2017, but then it increased every year, reaching 10.3% youth using their first e-cigarette within 5 minutes of waking by 2021.

Median [e-cigarette](#) use also increased from 3-5 days per month in 2014-2018 to 6-9 days per month in 2019-2020 and 10-19 days per month in 2021.

The recently released 2022 National Youth Tobacco Survey data show

that 2.55 million adolescents use e-cigarettes and 27.6% of adolescents use e-cigarettes daily. The comparable numbers reported in this paper for 2021 were 2.1 million and 24.7%.

"The increasing intensity of use of modern e-cigarettes highlights the clinical need to address youth addiction to these new high nicotine products over the course of many clinical encounters," says senior author Jonathan P. Winickoff, MD, MPH, a pediatrician at MGH and a professor of pediatrics at Harvard Medical School.

First author Stanton A. Glantz, Ph.D., a retired UCSF professor of medicine, adds, "In addition, stronger regulation including state and local comprehensive bans on the sale of flavored [tobacco products](#) such as voting YES on Proposition 31 on California's November ballot, should be implemented."

Abra Jeffers, Ph.D., is an additional coauthor.

More information: Stanton Glantz et al, Nicotine Addiction and Intensity of e-Cigarette Use by Adolescents in the US, 2014 to 2021, *JAMA Network Open* (2022). [DOI: 10.1001/jamanetworkopen.2022.40671](#)

Provided by Massachusetts General Hospital

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