**Research and Recommendations on Instruction in**

**Public Schools to Prevent the Use of E-Cigarettes**

# Developed: April 2018

# Background

E-cigarettes and other nicotine delivery systems, are dangerous, addicting, and harmful alternatives to traditional cigarettes. With appealing and youthful marketing tactics, e-cigarette usage is rising among young people, and new generations are being introduced to nicotine addiction. During the 2017, 85th Texas Legislative Session, [Senate Bill 489](http://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=85R&Bill=SB489) passed into law and instructed local school health advisory councils to recommend policies, procedures, and curriculum related to the instruction to prevent the use of e-cigarettes.

E-cigarettes are battery-powered devices that heat a liquid into an aerosol that the user inhales. The liquid typically contains nicotine, flavoring, and other additives. E-cigarettes can be referred to as “e-cigs” “cigalikes,” “e-hookas,” “mods,” “vape pens,” “vapes,” “tank system, “ and “Juul.” Some e-cigarettes are made to look like regular cigarettes, cigars, or pipes, others resemble pens, USB sticks, and other everyday items. Larger devices such as tank systems, or “mods,” do not resemble other tobacco products.

E-cigarettes are now the most commonly used tobacco product among youth in the United States with use by young adults (18-24) recently surpassing that of adults 25 years and older. In 2016, e-cigarettes were the most commonly used tobacco product among U.S. middle school and high school students, affirming e-cigarette use to be a major public health concern. Although the FDA requires minimum age restriction to prevent sales to minors, the use has increased 900% among high school students from 2011-2015.

Nearly 90% of adult smokers begin smoking at or before age 18 and because of the addictiveness of nicotine, about 3 out of 4 teen smokers end up smoking into adulthood, even if there is intention to quit in the future. Smoking may also be a gateway to illegal drug use as nicotine addiction often precedes the use of other drugs. It is also important to note that e-cigarettes can be used as a delivery system for marijuana and other drugs as well.

# Health Effects of E-Cigarettes

Exposure to nicotine, a highly addictive drug, can have long-term consequences for brain development. The brain is the last organ in the human body to fully develop as it continues to develop until the mid-20s. Nicotine exposure during periods of brain development, such as in adolescence, can disrupt the growth of the brain circuits that control attention, learning, and susceptibility to addiction. Exposure to nicotine during youth and young adulthood can be long-lasting, lower impulse control and influence mood disorders. Nicotine can also prime young brains for addiction to other drugs, such as cocaine and methamphetamine. In addition, nicotine can also have adverse effects during pregnancy and may contribute to cardiovascular disease.

E-cigarettes can expose both users and non-smokers to vapor containing carcinogens, toxins, formaldehyde, acetaldehydes, heavy metals, harmful chemicals, including nicotine, carbonyl compounds, and volatile organic compounds all known to cause adverse health effects. The health effects and potentially harmful doses of heated and aerosolized constituents of e-cigarette liquids, including solvents, flavorants and toxicants, are not completely understood. Ingestion of e-cigarette liquids containing nicotine can cause acute toxicity and possibly death if the content of refill cartridges or bottles containing nicotine are consumed. Propylene glycol and glycerin are the main base ingredients of the e-liquid. Thermal decomposition of propylene glycol and vegetable glycerin produces reactive carbonyls, including acrolein, formaldehyde, and acetaldehyde, which have known respiratory toxicities. They may also cause eye irritation, affect the central nervous system, impact behavior, and the damage the spleen.

# Recommendations

Schools are in a position to play a major role in reducing the number of youth that choose to use tobacco and e-cigarettes and other nicotine delivery products. The following recommendations are important in reducing the use of e-cigarettes and other nicotine delivery systems.

1. Implementation of comprehensive tobacco control and prevention strategies to reduce youths’ initiation and use of any nicotine product to include:
	1. Comprehensive tobacco prevention education to prevent youth tobacco use in all forms, including e-cigarettes. Prevention education should address all aspects of tobacco use, including short-and long-term negative health effects, social acceptability, social influences, negative social consequences, peer norms and peer pressure, resistance and refusal skills, and media literacy as it relates to tobacco marketing and advertising.
	2. Effective youth tobacco prevention programs should be:
* Grade and age sensitive, with the most intense instruction in middle school and reinforcement throughout high school;
* Consistent and evidence-based messages about the health risks of e-cigarette use and exposure to secondhand aerosol from e-cigarette;
1. Enforcement of state law and local policies related to all tobacco and nicotine use by students, staff and community members at all school activities.
2. Share best practices from state and local entities that have implemented programs and policies to address all tobacco use, including e-cigarettes among youth and young adults.

# References

1. U.S. Department of Health and Human Services. [The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General](https://www.cdc.gov/tobacco/data_statistics/sgr/50th-anniversary/index.htm). Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014 [accessed 2017 Jun 15].
2. U.S. Department of Health and Human Services. [Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General](https://www.cdc.gov/tobacco/data_statistics/sgr/2012/index.htm). Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012 [accessed 2017 Jun 15].
3. Centers for Disease Control and Prevention. [Flavored Tobacco Product Use Among Middle and High School Students—United States, 2014](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6438a2.htm?s_cid=mm6438a2_w). Morbidity and Mortality Weekly Report, 2015;64(38):1066–70 [accessed 2017 Jun 15].
4. Centers for Disease Control and Prevention. [Tobacco Use Among Middle and High School Students—United States, 2011–2016](https://www.cdc.gov/mmwr/volumes/66/wr/mm6623a1.htm?s_cid=mm6623a1_w). Morbidity and Mortality Weekly Report, 2017;66(23):597-603 [accessed 2017 Jun 15].
5. Centers for Disease Control and Prevention. [Tobacco Product Use Among Middle and High School Students—United States, 2011 and 2012](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6245a2.htm?s_cid=mm6245a2_w). Morbidity and Mortality Weekly Report, 2013;62(45):893–7 [accessed 2017 Jun 15].
6. Centers for Disease Control and Prevention. [Tobacco Use Among Middle and High School Students—United States, 2013](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6345a2.htm?s_cid=mm6345a2_w). Morbidity and Mortality Weekly Report, 2014;63(45):1021–6 [accessed 2017 Jun 15].
7. U.S. Department of Health and Human Services. [Reducing Tobacco Use: A Report of the Surgeon General](https://www.cdc.gov/tobacco/data_statistics/sgr/2000/index.htm). Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2000 [accessed 2017 Jun 15].
8. Centers for Disease Control and Prevention. [Combustible and Smokeless Tobacco Use Among High School Athletes—United States, 2001–2013](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6434a2.htm?s_cid=mm6434a2_w). Morbidity and Mortality Weekly Report, 2015;64(34):935–9 [accessed 2017 Jun 15].
9. Centers for Disease Control and Prevention. [E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General](https://www.cdc.gov/tobacco/data_statistics/sgr/e-cigarettes/index.htm). Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016 [accessed 2018 Mar 5].
10. Centers for Disease Control and Prevention. [Best Practices for Comprehensive Tobacco Control Programs—2014](https://www.cdc.gov/tobacco/stateandcommunity/best_practices/index.htm). Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014 [accessed 2017 Jun 15].

This document was developed by the TSHAC. For additional information about the committee, go to [TSHAC Home Page](http://www.dshs.texas.gov/schoolhealth/shadvise/).

*External links to other sites appearing here are intended to be informational and do not represent an endorsement by DSHS. These sites may not be accessible to people with disabilities. For information about any of the resources listed, contact the sponsoring organization directly. For comments or questions about this publication, contact the School Health Program at (512) 776-7279 or by email at* *schoolhealth@dshs.texas.gov**. Copyright free. Permission granted to forward or make copies in its entirety as needed.*