E-Cigarettes and Teens: Vaping, Puffing and Dripping
“Nicotine addiction begins when most tobacco users are teenagers, so let’s call this what it really is: a pediatric disease.”

David A. Kessler, MD
Commissioner of FDA, 1995
Most Tobacco Users Start Before Age 21

95% of adult smokers start before age 21

Tobacco use during youth:
• Immediate health consequences
• Accelerates development of chronic diseases over the lifespan

If a person makes it to age 21 without using their first tobacco product, it’s unlikely they’ll ever become a smoker
Public Health Harms

• Kids who use e-cigarettes are more likely to progress to cigarette use
• E-cigarettes use sweet flavors to attract kids
• Renormalizing smoking:
  – Allowed in places where smoking is not allowed
  – Advertising is completely unrestricted, with TV ads for the first time since 1971
  – Largely indistinguishable from cigarettes
Adolescence is a critical window in brain development.
The brain is still developing until about age 25.
During this developmental window, the brain develops rapidly, and is highly vulnerable to being shaped by the environment and outside sources.
Adolescent Brain Activity

Adult Vs. Teen Brain

- Most of the activity in the adult brain is in the frontal lobe
  - Thinking, reasoning, planning
- Most of the activity in the teen brain is focused in the center
  - Pleasure reward center
Judgment last to develop

The area of the brain that controls “executive functions” — including weighing long-term consequences and controlling impulses — is among the last to fully mature. Brain development from childhood to adulthood:

5-year-old brain | Preteen brain | Teen brain | 20-year-old brain

Dorsal lateral prefrontal cortex (“executive functions”)

Front

Top view

Back

Red/yellow: Parts of brain less fully mature

Blue/purple: Parts of brain more fully mature

Sources: National Institute of Mental Health; Paul Thompson, Ph.D., UCLA Laboratory of Neuro Imaging

Thomas McKay | The Denver Post
Prefrontal cortex still developing
- Decision making, impulse control, executive functioning

Adolescent brain uniquely vulnerable to nicotine addiction
- Become addicted more quickly, at lower levels of use
- Addiction begins when youth are “experimenting”

Early use of cigarettes associated with:
- Earlier addiction
- Greater risk of progressing to daily smoking
- Harder to quit
E-Cigarettes and Addiction

• Teens are uniquely vulnerable to nicotine addiction
• Most e-cigarettes contain nicotine
• JUUL, Phix, Myle, and other high-nicotine e-cigarettes may be particularly problematic.
• Teens who use e-cigarettes are more likely to progress to using traditional cigarettes

National Academies of Sciences Report, 2018: Public Health Consequences of E-Cigarettes