Media Briefing:
Substance use and misuse among U.S. teens

SciLine
Cannabis and the Teen Brain

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YOUTH COLLABORATIVE

Medical University of South Carolina
Past Month Substance Use

- Alcohol
- Been Drunk
- Cannabis
- e-Cigarettes (nicotine)
- Cigarettes
- Amphetamines
- Opioids
- Hallucinogens
- Cocaine
- MDMA/Ecstasy
- Inhalants
- Heroin

Monitoring the Future, 2022
Perception of Harm

Monitoring the Future, 2022
Ratio of Average Concentration of THC to CBD

ElSohly et al., 2018, *Biological Psychiatry*
The brain develops until age ~25

Gogtay et al., 2004; Bethlehem et al., 2022

Normal Development:
↓ Gray matter
↑ White matter
Reward Regions Develop before Cognitive Control Regions

Somerville & Casey, 2010; van Duijvenvoorde et al., 2016; Mills et al., 2014; Baker et al., 2015
Heavy Cannabis Use during Adolescence ↓ IQ

Meier et al., 2012, PNAS
Cannabis and Cognitive Functioning in Adolescents and Young Adults

- ↓ learning
- ↓ speed of processing
- ↓ delayed memory
- ↓ inhibition
- ↓ working memory
- ↓ attention

Scott et al., 2018, JAMA Psychiatry
Brain Function and Youth Cannabis Use

Blest-Hopley et al., 2018, Neuroscience and Biobehavioral Reviews
Summary: Substance Using Youth After cannabis use:

• Neuropsychological: IQ, learning, processing speed, memory, impulse control, attention
• Structural: less efficient white matter tracts
• Functional: compensatory brain activation
• Co-use=most pronounced effects

Lees, Debenham, & Squeglia, 2021, *Alcohol Research Current Reviews*
Vaping

- Deepa Camenga, MD, MHS
- I have no relevant financial relationships to disclose

- SciLine Media Briefing
- May 25, 2022
More than 2 million U.S. youth currently use e-cigarettes

11.3% of high school students
2.8% of middle school students

Image source: www.fda.gov/tobacco
WHY DO TEENS CONTINUE TO USE E-CIGARETTES?

Data from: 2021 National Youth Tobacco Survey

1. To relieve stress, anxiety, depression

2. For the High

HEALTH EFFECTS

NICOTINE VAPING

BRAIN HEALTH
- Addiction

LUNG HEALTH
- Wheezing
- Asthma

INCREASES RISK OF:
- Trying other substances
- Initiating combustible tobacco products

Sources:
HEALTH EFFECTS

CANNABIS VAPING

SEVERE LUNG DISEASE
• EVALI

INCREASED RISK OF
• Developing psychosis
• Trying other substances
• Developing an addiction

CHANGES IN
• Learning
• Attention
• Memory
• Speed of processing

Sources:
TOBACCO FREE IS THE HEALTHIEST CHOICE

• Nicotine causes addiction, especially in teens with developing brains
• Ingredients in e-cigarettes could be harmful to the lungs
• Vaping is a harmful way to manage anxiety, depression, and stress
• E-cigarettes should not be used as a “substitute” for cigarettes
• Vaping is still a serious public health threat

www.ecigarettes.surgeongeneral.gov
Resources


• https://e-cigarettes.surgeongeneral.gov/knowtherisks
Opioids
What Are Opioids?

A mainstay of medical practice:
Not always needed in the treatment of pain, but extremely effective for the treatment of severe acute pain; can help people with chronic pain function

Prescription painkillers:
Common pills include oxycodone (Percocet, Oxycontin), hydrocodone (Vicodin), and morphine; even fentanyl is medically prescribed

Opioids sold on the illicit market:
Heroin and fentanyl; fentanyl is manufactured outside the US and imported, then introduced into the drug supply

Fentanyl contamination:
Fentanyl is rampant, including in other substances (e.g., cocaine); many pills sold on the street are counterfeit pills that contain fentanyl and billed as an opioid or another medication (e.g., Xanax)
Trends in Youth Overdose Deaths

Figure. Adolescent Overdose Deaths, 2010-2021

A Overdose mortality among adolescents by substance type

- Illicit fentanyls and synthetics
- Benzodiazepines
- Methamphetamine
- Cocaine
- Prescription opioids
- Heroin

Death rate per 100,000

Year


Friedman J, et al. JAMA. 2022;327(14):1398-1400
Trends in Polysubstance Use

Opioid overdose mortality with and without other substances

Other substances:
1. Cocaine
2. Benzodiazepines
3. Methamphetamine

Year

Overdose death rate per 100,000 individuals

Overdose vs. Addiction:
- Given the lethality of fentanyl, one counterfeit pill can kill
- Not every teen who overdoses has addiction, but many teens do
- 1.6M youth nationally have addiction, few get treatment

Risk Factors for Addiction:
- Other substance use (nicotine, alcohol, cannabis)
- Earlier age of first substance use
- Untreated mental health problems (depression, anxiety, trauma)
- Family history of addiction (any)
Recommendations for Reporters:

Tell the stories of teens and families.

Avoid the simple narrative.