Vaping and Adolescents
The New Public Health Crisis

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North Shore Community Health
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Help Us Count!

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If you are viewing as a group, go to the “Chat” icon and type in the name of the person registered and the total number of additional people in the room.

e.g., Tammy Jones +3
SCHOOL-BASED HEALTH ALLIANCE
Redefining Health for Kids and Teens
We Believe...
In the transformational power of the health and education intersection

HEALTHY STUDENTS make better learners
REMINDERS

💪 All attendees are in listen-only mode.

💪 We want to hear your questions! To ask a question during the session, use the “Chat” icon that appears on the bottom your Zoom control panel.

💪 Please complete evaluation poll questions at the end of the presentation.
WEBINAR ARCHIVE

- The State of the Science: Teen Brain Development and the Impact of Marijuana
- Hallways to Health 4-Part Webinar Series
- Youth-Led 2-Part Webinar Series
- Quality Counts: How to Download and Use Your 2016-17 NQI Reports and Prepare for 2017-18 Reporting

http://www.sbh4all.org/webinars
TODAY’S PRESENTER

Allison Kilcoyne, MS RN FNP-BC
Director of School-Based Health at North Shore Community Health and
President of Massachusetts School-Based Health Alliance
Nothing to Disclose
e-cigs, vape pens, e-hookahs, e-pipes, tanks, mods, vapes, electronic nicotine delivery systems, or ENDS, JUUL (Juuling), BO, Blue, .....
Vaping: what is it

- Developed in 2003 by Chinese pharmacologist to aide father dying of lung cancer to quit smoking
- Inhaling and exhaling the aerosol (often called vapor) produced by an e-cigarette or similar
- Battery-powered device
- Delivers nicotine, THC, and more
- Research on tobacco use is helpful
Propylene glycol
Glycerin
Nicotine

Water
Flavoring

Potentially toxic contaminants
and vaporization by-products

VAPOR

Battery

Heating element in the atomization
chamber vaporizes the nicotine solution.

Nicotine cartridge holds the nicotine solution.
The nicotine content may be high, medium, low, or none.

Mouthpiece

JUUL

- Pods contain e-liquid with highly absorbable nicotine salts
  - Heated into vapor and inhaled
- 1 JUUL pod = 0.7mL of nicotine (5% concentration)
  - Nicotine equivalent of 1 pack of cigarettes (≈200 puffs)
About 400 puffs each disposable = 2 packs cigarettes
One disposable every 4 days = ½ pack cigarettes per day
Use of e cigarette:

- Produces an aerosol that contains:
  - Nicotine
  - Ultrafine particles that can be inhaled deep into the lungs
  - Volatile organic compounds
  - Cancer-causing chemicals
  - Flavoring such as diacetyl, a chemical linked to a serious lung disease
  - Heavy metals such as nickel, tin, and lead
Poll: Why do adolescents vape?

Use by a friend or family member
Taste, flavors
Belief low risk, less harm
Curiosity
All of the above

https://e-cigarettes.surgeongeneral.gov/getthefacts.html
Poll question discussion

One in ten youth perceived intermittent cigarette smoking as causing “little” or “no” harm; this perception was higher among current users. Efforts to educate youth about the risks of even intermittent tobacco product use could reduce misperceptions of harm.

“I started at a party, then I bought my own, then I started using it every day. That is all within a month.”*

“My boyfriend gave me one for Christmas.”*

“It smelled good (cotton candy) so I tried and liked it.”*

“My grandfather had one and I tried it, then I got one, then I used it all the time.”*

Harm Perceptions of Intermittent Tobacco Product Use Among U.S. Youth, 2016
Wang, Teresa W. et al.
Journal of Adolescent Health, Volume 62, Issue 6, 750 - 753
How big is the problem of vaping in teens?

Past-month vaping of nicotine or marijuana jumped across all grades. Past-month use of marijuana is steady as cigarette use declines.
99% of e-cigarette liquids sold in the US contain nicotine.

Nearly 2 in 5 students in 12th grade report past-year vaping, raising concerns about the impact on brain health and potential for addiction.

99% of e-cigarette liquids sold in the US contain nicotine
Poll: Why the increase in vaping in youth?

1. Peer pressure
2. Increased Access
3. Increased Advertising
4. Addictive properties
Why the increase in use?

E-cigarette use among youth is rising as e-cigarette advertising grows

Dollars spent on e-cigarette advertising
Past 30-day e-cigarette use among youth

What’s old is new again

We make Virginia Slims especially for women because they are biologically superior to men.

You’ve come a long way, baby.

Cool ain’t Cold. Newport is.
What’s old is new again

[Images of Juul, blu, and Rau Hand Kit]
Nicotine

• Nicotine takes 10-15 seconds to reach the brain
  • Effects last approximately 30 minutes
• Short-term stimulant properties
• Acts on Ach receptors
  • produce dopamine, serotonin and glutamate
• Pleasure center activation
• Highly addictive
  • more than alcohol and cannabis; similar to cocaine
Substance use and the teen brain

Activation of the reward pathway by addictive drugs

- Pre-frontal cortex
- Amygdala
- Nucleus accumbens

- Alcohol
- Cocaine
- Heroin
- Nicotine
Nicotine

The onset of action of nicotine is 7-10 seconds. Elimination half-life of nicotine is 2 to 3 hours, meaning that the level of nicotine in the blood decreases by one half after a smoker stops smoking for that length of time.

“Nicotine is a powerful drug that meets all established criteria for a drug that produces addiction—specifically, dependence and withdrawal. Nicotine is as addictive as heroin and cocaine, and it has the paradoxical effects of being a stimulant and a depressant. No other drug doses at such a high frequency: a pack-a-day smoker who smokes for 14 years will have more than 1 million dosing opportunities.” – World Health Organization

The Thing about JUUL

How quickly different forms of nicotine enter the bloodstream

- JUUL Patented Formula
  - Nicotine with benzoic acid
- Pall Mall Cigarettes
- Earlier E-Cigarettes
  - Freebase nicotine

JUUL tested their formula with various organic acids and found that adding benzoic acid to nicotine makes it taste milder, so users can inhale deeply.

- Developers researched tobacco company settlement
- Focused on first puff
- Stanford tech developers
- Marketing to youth

## Flavors drive e-cigarette use among high schoolers

High school students like fruit, mint and candy flavors of e-cigarette nicotine liquids far more than tobacco flavors, survey data shows. Regulators have pressured Juul and other vaping device makers to stop offering flavors that appeal to children.

### MOST POPULAR E-CIGARETTE FLAVORS, 2017-19

Flavors used by high school students in the previous 30 days.

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### JUUL POD FLAVORS

Juul stopped selling mango, fruit, cucumber and creme pods in the United States on Oct. 17.

- Fruit
- Mango
- Menthol
- Cucumber
- Mint
- Creme
- Classic Tobacco
- Virginia Tobacco

Note: In each year's survey, alcohol, chocolate or clove or spice flavors got less than 10% of responses each.

Sources: National Youth Tobacco Survey, U.S. Food and Drug Administration; Juul
Vaping THC

Vaping marijuana?

“Premium wax vaporizer”

“Liquid shatter” pen
Vaping Sickliness Rising: 153 Cases Reported in 16 States

By Sheila Kassell
Aug 23, 2019

WASHINGTON -- Reports are circulating that vaping-related respiratory illnesses have continued to rise in the past few weeks, and many of the patients are teenagers.

In a statement on Wednesday, the Centers for Disease Control and Prevention said that all of the cases occurred in people who acknowledged using e-cigarettes and/or marijuana, known as THC, the high-inducing chemical in marijuana.

Since June, 183 people in 12 states have reported vaping-related injuries, the C.D.C. said.

Jason Henry for The New York Times

First Death in a Spate of Vaping Sicklinesses Reported by Health Officials

By Matt Richtel and Sheila Kassell
Aug 23, 2019

Since June, 183 people in 12 states have reported vaping-related injuries, the C.D.C. said.

Jason Henry for The New York Times

Dozens of Young People Hospitalized for Breathing and Lung Problems After Vaping

The trend is consistent with what has been observed in teenagers, who are often more likely to try vaping as a way to avoid using combustible cigarettes.

The Illinois Department of Public Health, which has received reports of vaping-related illnesses in teenagers, said in a news release that the agency is investigating the cases and has issued an advisory to health care providers to monitor for signs of lung injury in people who have used e-cigarettes.

The agency has also recommended that teenagers who have used e-cigarettes should be evaluated by a health care provider if they experience any symptoms that could be related to vaping, such as coughing, shortness of breath, or chest pain.
Not just counterfeit: Legal THC vaping products linked to lung illnesses

Six patients in Massachusetts reported purchasing THC products from licensed dispensaries.

E-cigarette Vaping Associated Lung Illness (EVALI)

- Most patients with EVALI have been men and adolescent boys (67%), have been younger than 35 years of age (78%), and have reported using e-cigarette products containing tetrahydrocannabinol (THC) (80%)
- ED visits spiked in June 2019, peaked September 2019, lower incidence as of November 2019
- Vitamin E oil and other substances used to create appearance of higher THC concentration

https://www.nejm.org/doi/full/10.1056/NEJMr1915313#article supplementary_material
Emergency Department (ED) Visits with Electronic Cigarette (E-Cigarette) Product Use as the Reason for the Visit, According to Age Group.

www.nejm.org/doi/full/10.1056/NEJMsr1915313#article_supplementary_material
Other Health Implications?

• harm to brain development – impairments in attention and working memory
• association with mood disorders and poor impulse control
• increase the risk of young people smoking cigarettes and change brain chemistry in ways that make adolescent brains more susceptible to other addictive drugs
• Possible seizures

Vaping is BAD - So what do we do?

- Prevention strategies
  - Delay use!
- Treatment strategies
  - Behavioral and pharmacologic
- Restorative Justice Strategies for Schools
  - Consequence vs. Opportunity

Fourth leg – ADVOCACY!
Prevention Campaigns

#ditchJUUL
https://www.thetruth.com/take-action/ditchjuul

The Real Cost Campaign
https://therealcost.betobaccofree.hhs.gov/?g=t

Make Smoking History
http://makesmokinghistory.org/dangers-of-vaping/schools/

Stanford Prevention Toolkit
https://med.stanford.edu/tobaccopreventiontoolkit/E-Cigs.html
E-Cigarettes and Vape Pens

Overview

This module provides an understanding of the inner workings of e-cigarettes, the content of the aerosols they produce, and thirdhand smoke. It’s broken down into 5 units, each of which explore e-cigarettes in-depth.

Please note: e-cigarettes, vape pens, etc. may be abbreviated as e-cigs or vapes, and refer to any device similar to an e-cigarette.

Goals

Increase knowledge about basic facts of e-cigarettes and the harm they cause.
A MESSAGE FROM THE U.S. SURGEON GENERAL
The human brain is the last organ to fully develop, at around age 25. Nicotine in e-cigarettes can harm brain development and lead to addiction in youth and young adults. Let's protect our kids. Learn how at e-cigarettes.surgeongeneral.gov
Technology and anti-vaping campaigns

- Adolescent Counseling and Technology (ACT) for nicotine and tobacco [http://www.possibilitiesforchange.com/](http://www.possibilitiesforchange.com/)

- Web based video game intervention for young adolescents: [https://www.smokescreengame.org/](https://www.smokescreengame.org/)
What do we see in youth that have been vaping?

- Increased use – sometimes all day long use
- Taking risks to get access to vapes
- Hiding from friends and family
- Vaping alone
- Getting in trouble at school
Nicotine Dependence Diagnosis

Tolerance
Withdrawal
Craving
Taking in larger amounts or longer than expected
Unsuccessful attempts to cut down
Giving up social, recreational or occupational activities
Great deal of time trying to obtain nicotine
Use despite knowledge of health or social risks

F17.29-, Nicotine dependence, other tobacco products. Electronic nicotine delivery systems (ENDS) are non-combustible tobacco products

DSM5
Treatment of Nicotine Dependence

**Behavioral**
- Education
- Groups
- Peer Support
- Provider Support

**Pharmacologic**
- Nicotine Replacement Therapy
- Under 18 years requires prescription
- Some health plans do not pay for products
- Considered off label prescribing
Opportunities for Restorative Justice Programs
How have schools responded?

- Searching all students
- Taking doors off stalls in bathrooms
- Locking bathrooms
- No after school activities
- Vaping detectors
- Out of school suspension
Restorative Justice Approach

*Repairing the harm caused by the behavior*

Change to mindset – an opportunity to intervene for the health of the youth
Alternative to suspension programs could....

• Identify key people in the school students have to meet with: school nurse, resource officer, health teacher
• Have students investigate health effects of vaping and create a project – video, poster, etc.
• Go to their health center or PCP for an educational appointment
• Attend a multi-session educational group
• Sessions led by SBHC NPs
• Individual or Groups
• All offered follow up NP visits, NRT and/or referral to Behavioral Health
Things to remember:

- Vaping is very common in adolescents and has been increasing dramatically the past 2 years
- Nicotine is a highly addictive chemical that effects the adolescent brain immediately
- There continue to be unknown health consequences of vaping
- It is very difficult to “just stop” vaping, many youth need both behavioral and pharmacologic support
Questions?
BECOME A MEMBER!
SAVE THE DATE!

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COLORADO ASSOCIATION FOR SCHOOL-BASED HEALTH CARE

SCHOOL-BASED HEALTH CARE: ELEVATING
A SCHOOL CLIMATE OF HEALTH AND SAFETY

June 23-25, 2020 • DENVER, CO.
Thank You!

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