DISCLOSURES:
I have no actual or potential conflicts of interest to disclose.

SMOKING AND RESPIRATORY DISEASE
Smoking can cause lung disease by damaging your airways and the small air sacs (alveoli) found in your lungs.1,2

Lung disease caused by smoking include COPD, which includes emphysema and chronic bronchitis.1,2

Cigarette smoking causes most cases of lung cancer.1,2

If you have asthma, tobacco smoke can trigger an attack or make an attack worse.1,2

Smokers are 12 to 13 times more likely to die from COPD than nonsmokers.1

Risks from Smoking
Breathing can damage every part of your body.
As per the CDC:
Secondhand smoke harms children and adults. There is no risk-free level of secondhand smoke exposure. Even brief exposure can be harmful to health.1-3 Since 1964, approximately 2,500,000 nonsmokers have died from health problems caused by exposure to secondhand smoke.1

Health Effects in Adults:
- In adults who have never smoked, secondhand smoke can cause:
  - Heart Disease:
    - For nonsmokers, breathing secondhand smoke has numerous harmful effects on the heart and blood vessels.1-2
    - It is estimated that secondhand smoke causes about 34,000 heart disease deaths each year among adult nonsmokers in the United States.1
  - Lung Cancer:2
    - Secondhand smoke exposure causes more than 3,700 lung cancer deaths each year among adult nonsmokers in the United States.1
  - Stroke:

Health Effects in Children:
- In children, secondhand smoke causes the following:1-3,6
  - Ear Infections
  - More frequent and severe asthma attacks
  - Respiratory symptoms (for example, coughing, sneezing, and shortness of breath)
  - Respiratory infections (bronchitis and pneumonia)
  - A greater risk for sudden infant death syndrome (SIDS)

As per the CDC:
- Cigars:
  - Regular cigar smoking is associated with an increased risk for cancers of the lung, esophagus, larynx (voice box), and oral cavity (lip, tongue, mouth, throat).1,2
  - Cigar smoking is linked to gum disease and tooth loss.2
  - Heavy cigar smokers and those who inhale deeply may be at increased risk for developing coronary heart disease.1,2
  - Heavy cigar smoking increases the risk for lung diseases, such as emphysema and chronic bronchitis.1,2

CDC: Using a hookah to smoke tobacco poses serious health risks to smokers and others exposed to the smoke from the hookah.

Hookahs are water pipes that are used to smoke specially made tobacco that comes in different flavors, such as apple, mint, cherry, chocolate, coconut, licorice, cappuccino, and watermelon.2-3

Although many users think it is less harmful, hookah smoking has many of the same health risks as cigarette smoking.1,5

Hookah is also called narghile, argileh, shisha, hookah-bubble, and gaza.1,5

Hookahs vary in size, shape, and style.6

A typical modern hookah has a head (with holes in the bottom), a metal body, a water bowl, and a hose with a mouthpiece.1,2

Hookah smoking is typically done in groups, with the same mouthpiece passed from person to person.1,2,4
CDC: Using a hookah to smoke tobacco poses serious health risks to smokers and others exposed to the smoke from the hookah.

Hookah Smoke and Cancer
• The charcoal used to heat the tobacco can raise health risks by producing high levels of carbon monoxide, metals, and cancer-causing chemicals.1,4
• Even after it has passed through water, the smoke from a hookah has high levels of these toxic agents.4
• Hookah tobacco and smoke contain several toxic agents known to cause lung, bladder, and oral cancers.1,4
• Tobacco juices from hookahs irritate the mouth and increase the risk of developing oral cancers.4

Other Health Effects of Hookah Smoke
• Hookah tobacco and smoke contain many toxic agents that can cause clogged arteries and heart disease.1,4
• Infections may be passed to other smokers by sharing a hookah.2
• Babies born to women who smoked water pipes every day while pregnant weigh less at birth (at least 3½ ounces less) than babies born to nonsmokers.5,8
• Babies born to hookah smokers are also at increased risk for respiratory diseases.8

TOBACCO BIG PICTURE
Cigarette smoking is the leading cause of preventable disease & death in US
• > 480,000 deaths every year
• 1 of every 5 deaths | 1 of every 3 cancer deaths

15.5% of US adult population smokes
• 38 million adults ≥ 18 years

$300 billion in tobacco attributable costs every year

Defective product
• Kills half its long-term users
• Adult smokers die 10 years earlier than non-smokers

SOURCE: CDC, Tobacco-Related Mortality, 2019

TOBACCO USE STARTS DURING ADOLESCENCE
Nearly 9 out of 10 cigarette smokers first tried smoking by age 18

More than 6 out of 10 regular users transition to adult smokers

SOURCE: CDC, Smoking & Tobacco Use, 2019
ADOLESCENTS AND CIGARETTES

WHY THE DECLINE IN ADOLESCENT CIGARETTE USE?

Major Efforts
- Public education campaigns
- US Surgeon General Reports (1964-2016)
- Bans on television advertising
- Restriction on sales & marketing to youth
- State and Federal Tax Laws
- US Tobacco Control Act (2009)
- Tobacco 21 – including NJ as of November 2017

But…

NEW PRODUCTS/TECHNOLOGY-CHALLENGING TRENDS

- JUUL
- VAPORIZED
RISE OF E-CIGARETTES
Percentage of middle and high school students who currently use e-cigarettes and any tobacco product – United States, 2011–2018

SURGING TO AN “EPIDEMIC”
Current E-cigarette Use

High school students
- 20.8% = 3.05 million students

Middle school students
- 4.9% = 570,000 students

WHAT ARE E-CIGARETTES?
Handheld device produce aerosol inhaled by user

Solution of nicotine, flavoring chemicals, propylene glycol & “other”

Includes terms like:
- Vapes, mods, tanks & pod systems, like JUUL

E-CIGARETTE COMPANIES TARGET CHILDREN AND TEENS

Youth targeted channels
- Television, point-of-sale, magazines, promotional activities, & social media

Use of “Key” themes
- Sexual content, “customer satisfaction”, “freedom”
- Effective in traditional cigarette advertising & promotion

Unique flavors
- Confectionary in nature
- Encourage youth experimentation, regular use, & addiction

Source: Dai H, Hao J. Flavored Electronic Cigarette Use and Smoking Among Youth Populations and EJH (2016)

RISE OF JUUL

JUUL DOMINATES E-CIGARETTE MARKET

Dollar share percentage of the e-cigarette traditional retail market, as of March 2018

Source: Nielsen Total US e-AOC/Convenience Database and Wells Fargo Securities, LLC

TARGETED ADS 1

Twitter - Sponsored Ads

TARGETED ADS 2

Instagram – Sponsored Ads
“Love this Look”
RISE OF JUUL “CULTURE”

- Appeal to wide audience
  - Sleek, modern design
  - Packaging like a smartphone
  - Customizable covers

- Attractive-sounding flavors
  - Creme, fruit medley, mango, & cool mint

- Easy to purchase & use
  - Buy online
  - Open starter kit, slide a flavor pod into device = start vaping

- Easy to conceal from authority figures

Source: Barrington Truquan et al. Earnest Use of “Pod Mod” E-Cigarettes – Urgent Concerns. JAMA 2018

E-CIGARETTES & SECONDHAND SMOKE

- Secondhand aerosol
  - Known harmful toxicants & carcinogens found in emissions
  - Heavy metals, formaldehyde, & nicotine
  - NOT “safe”


E-CIGARETTES AND IMMEDIATE HEALTH HARMs

- Minimal evidence from epidemiological studies
  - Hard to study adolescents
  - Time needed to investigate new products

- Adverse effects on lung health
  - Odds of asthma increased 50% among adolescents e-cig users
  - Controlled for cigarette smoking and other risk factors

- E-cigarettes have their own risk profile separate from cigarettes

Source: Schweitzer et al. Preventive Medicine, Oct 2017
**Adolescent Development and Nicotine**

- Intense neurodevelopmental molding and maturation
  - Brain regions associated with motivation, impulsivity, and addiction

  Greater vulnerability to addiction
  - Especially nicotine

Adolescent exposure increases risk:
- Mood issues
- Attention problems


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**MISCONCEPTION**

*63% of Juul users don't know that the product always contains nicotine.*

Source: Barrington-Trimis et al. Adolescents' Use of "Pod Mod" E-Cigarettes—Urgent Concerns. NEJM 2018

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**Juul = High Nicotine Delivery System**

- 1 POD = (same nicotine) 20 cigarettes
  - 2-10x higher than earlier e-cigarette devices

Nicotine without aversive user experience
- No noxious taste/sensation, like cigarettes

80% of 15-24 yo continue using Juul
- Common social media post: “Addicted to my Juul”

Source: Barrington-Trimis et al. Adolescents’ Use of "Pod Mod" E-Cigarettes—Urgent Concerns. NEJM 2018
E-CIGARETTE USERS TRANSITION TO CIGARETTE USERS

Multiples, Long-term studies
- Teen e-cigarette users 3.6 times more likely to use cigarettes vs non-users
- Otherwise low-risk teens
- Juul may worsen risk

Expert consensus
- 2016 Surgeon General Report
- 2018 National Academy of Science Report

Potential to addict a new generation to tobacco

ROLE IN HELPING ADULT, ESTABLISHED SMOKERS QUIT?

E-cigarettes as effective smoking cessation not supported by scientific evidence
- Limited number of small RCTs
- Observational studies mixed

Conflicting evidence:
- E-cigs to help quit smoking may increase risk of not quitting

Connect adult smokers to evidence-based options
- Nicotine Replacement Therapy (NRT)
- Therapy via QUITLINE: 1-800-QUIT-NOW

E-CIGARETTE REGULATION AND THE FDA

Delayed appropriate action
- FDA was set to regulate e-cigarettes like other tobacco products
- August 2017 – delayed “premarket review” regulation to 2022

Called youth e-cigarette use an epidemic - Fall 2018

Federal investigation of Juul & other e-cig companies
- Advertising practices targeting teens
E-CIGARETTE POLICY – NEXT STEPS

National, FDA:
• Remove all flavors from e-cigs
• Suspend internet sales
• Restrict advertising
• Removal of Juul
• All products pre-market review to stay on market

Local and State Level:
• Incorporate e-cigarettes into smoke free policies
• Preventing access to e-cigarettes by youth
• Price and tax policies
• Regulation of marketing
• Educational initiatives, especially at schools

WHAT WE KNOW AND WHAT WE DON’T KNOW

SIGNIFICANT CONCLUSIVE evidence:
• Harms of tobacco
• Manipulative tactics used by big tobacco – and now e-cigarette companies – to entice children and youth and perpetuate use

Marijuana is different
• Federal regulation - Schedule I Controlled Substance
• Limits research into harms and potential benefits
• Limits ability to capture surveillance data

Brief review of potential benefits and potential harms of marijuana

ADOLESCENTS AND MARIJUANA

% who used in last 12 months

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<th>10th Grade</th>
<th>12th Grade</th>
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<td>13%</td>
<td>10%</td>
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<td>2011</td>
<td>13%</td>
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<tr>
<td>2019</td>
<td>5%</td>
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<td>1%</td>
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</tbody>
</table>

Source: The Monitoring the Future survey, University of Michigan
DEFINITIONS

Cannabis
- 3 species of hemp: Cannabis sativa, indica, & ruderalis

Marijuana
- Generic term: dried leaves, flowers, stems, and seeds from the hemp

Cannabis chemicals = Cannabinoids
- > 60 types, differ in the degree of psychoactivity

Delta-9-tetrahydrocannabinol (THC)
- Psychoactive
- Long-term: may cause neurodevelopmental deficits in adolescents **

Cannabidiol (CBD)
- Not psychoactive - preferred agents as medicinal
- Different strains: varying ratios of THC to CBD
- Medicinal-grade: ideally, high ratio of CBD to THC

POTENTIAL THERAPEUTIC EFFECTS OF CBD IN ADULTS

Recent Meta-analysis (JAMA 2015)
- 79 trials, 6,462 participants

Use of CBD may:
- Moderate quality evidence - improves treatment of chronic pain & spasticity
- Low quality evidence - associated with improvement:
  - Nausea & vomiting from chemotherapy
  - Weight gain in HIV infection
  - Sleep disorders
  - Tourette Syndrome

Increased risk of short-term side effects
- Dizziness, dry mouth, nausea, fatigue, somnolence, euphoria, vomiting, disorientation, drowsiness, confusion, loss of balance, & hallucination

CANDID ABOUT LACK OF DATA AND CLEAR HARMS

Lots (!) of anecdotal reports about potential benefits of marijuana derivatives

Higher rate of Unintended Exposures in Colorado vs rest of United States (JAMA 2016)

More CBD studies needed and underway:
- Asperger's syndrome
- Autism, especially mood regulation
**POTENTIAL HEALTH HARMS 1**

**Injury and Death**
- Use prior to driving increases risk of motor vehicle accident
- Increased risk of unintentional cannabis overdose among children

**Cancer**
- Smoking cannabis DOES NOT increase risk for cancers often associated with tobacco use
- Limited evidence association with one sub-type of testicular cancer

**Source:** National Academy of Science. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. 2017

**POTENTIAL HEALTH HARMS 2**

**Heart Attack, Stroke, and Diabetes**
- More research is needed
- Some evidence smoking cannabis may trigger a heart attack

**Respiratory Disease**
- Regular smoking associated with more chronic bronchitis and worse cough/cold symptoms
- Quitting cannabis smoking is likely to reduce these conditions
- Unclear whether cannabis use associated with respiratory diseases:
  - Chronic obstructive pulmonary disease
  - Asthma
  - Worsened lung function

**Source:** National Academy of Science. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. 2017

**POTENTIAL HEALTH HARMS 3**

**Mental Health**
- Associated increased risk:
  - Schizophrenia, other psychoses, anxiety
  - Lesser extent depression
- Heavy cannabis users:
  - Increased suicidal thoughts vs non-users
  - Exacerbates symptoms of bipolar disorder

**Psychosocial**
- Limited evidence, use associated:
  - Impairments in academic achievement and education
  - Impairments in social relationships & social roles
  - Increased rates of unemployment & low socioeconomic status

**Source:** National Academy of Science. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research. 2017
POTENTIAL HEALTH HARMs

Prenatal, Perinatal, and Neonatal Exposure
• Smoking cannabis during pregnancy associated with lower birth weight
• Relationship with other pregnancy and childhood outcomes unclear

Problem Cannabis Use
• Use at a younger age (especially < 14 yo) increases likelihood of problem cannabis use

Cannabis Use and the Abuse of Other Substances
• Limited evidence cannabis use increases use of tobacco, alcohol and other illicit drugs

MARIJUANA: LEGALITY BY US JURISDICTION

33 states plus District of Columbia with laws broadly legalizing in some form (As of November 7th, 2018)

Medical marijuana
• 23 states
• Restrictions

Recreational Use
• 10 states plus DC

No laws legalizing

CHANGING USE PATTERNS WITH LEGALIZATION?

Adolescents
• Medical legalization NOT associated with increased use
• Recreational legalization NOT associated with increase use
• Since 2002 — frequency of teen use has decreased

Adults (over 18) – Shifting patterns
• Mode of use
• Decrease in smoking, increase in vaping and edibles
• Use by age
• Highest past month — 18 to 25 year olds (20%)  
• Fastest growing use group — 55 years and older
• Intensity/frequency
• Past month use increases in all AGE groups except teens
• Daily cannabis users: 2.5 times as many adults as youth
3. HEALTHCARE PROVIDERS: APPROACH TO COUNSELING

WHAT DOESN'T WORK

“Just Say No” and D.A.R.E.
- Not effective
- Authoritarian

May actually increase youth awareness and experimentation
- Sparks curiosity
- False sense of use rates
- Feeling of being “abnormal” for not using


WHAT DOES?

Truth campaign
- Deterred hundreds of thousands of teens from starting smoking
- Harnessed youthful rebellion
- Not smoking NOT about pleasing a parental authority figure

People your parents’ age tried to manipulate you, get you addicted to a product that would kill you

Latest campaign: “Above the Influence”
- Not using drugs exemplifies & maximizes youth freedom

Source: Farrelly et al. The Influence of the National truth® Campaign on Smoking Initiation. AJPM 2009.
**APPROACH TO COUNSELING**

**Non-judgement**

**Motivational Interviewing**  
- Person-centered counseling method  
- Addresses ambivalence

**Get their perspective**  
- Ask why, before suggesting why not

**Facts may not get you very far**  
- But they have role

**Share Your Concerns - “Can I offer some Advice?”**  
- Emphasizing your role as healthcare “consultant”  
  
*Source: Motivational Interviewing in a Brief Encounter: A Skills Handbook via the ABP:  
https://www.abp.org/sites/default/files/pdf/ 
miskillsbook.pdf*

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**TREATMENT OPTIONS**

**Healthcare providers: trusted sources of healthcare advice for patients and families**

**Effective prevention & treatment options**

**E-cigarette & Tobacco Use**  
- 1-800-QUIT-NOW (784-8669)  
- SmokefreeTeen.gov

**Marijuana Problem use**  
- Substance Abuse Helpline (SAMHSA)  
- 1-800-662-HELP (4357)

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**CONVERSATIONS WITH PATIENTS**

**Patient: What are the risk of e-cigarettes?**  
- Unknown harmful things in these products, including nicotine. E-cigarette strongly associated with going on to use traditional cigarettes.

**Patient: My friends use e-cigarettes that don’t have any nicotine in them.**  
- Nicotine is very common in e-cigarettes, and e-cigarettes may not be labeled to accurately show their ingredients. Nicotine is very addictive and can harm your brain.
CONVERSATIONS WITH PATIENTS

Patient: I thought e-cigarettes were used to help people quit smoking.

- The evidence isn’t clear on whether e-cigarettes help people quit smoking regular cigarettes, but we already know that e-cigarette use is a health risk for young people. For example, nicotine can harm brain development, and your brain continues developing until around age 25.

Patient: I’ve heard e-cigarettes are less harmful than regular cigarettes.

- They may not contain as many dangerous chemicals as cigarettes, but that doesn’t mean they’re safe to use. Many of the chemicals in e-liquids and in the aerosol from e-cigarettes are known to cause cancer in humans.

CONVERSATIONS WITH PATIENTS

Patient: There’s no smoke from e-cigarettes – just harmless water vapor.

- The aerosol that’s created when an e-cigarette heats up the e-liquid is not just water vapor, and is not harmless either for users or for others who are exposed to it secondhand. Besides nicotine, which is harmful to young people’s health on its own, heavy metals that can cause respiratory distress and disease have been found in e-cigarette aerosol. Chemicals that are known to cause cancer and that have been linked to lung disease can also be present in e-cigarette aerosol.

RESOURCES:


February 2019, Volume 143 / Issue 2
From the American Academy of Pediatrics
Policy Statement
E-Cigarettes and Similar Devices
Brian P. Jensen, Susan C. Walley, Section on Tobacco Control

https://smokefree.gov

https://www.cdc.gov/tobacco/data_statistics/index.htm