Vaping: Seeing Through the Smoke
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Objectives
- Look back the Origins of this Epidemic
- Look into the devices and science of vaping
- Discuss strategies for prevention and quitting
- Review of what we know so far on Vaping Associated Lung Injury

Lettuce vs. Tobacco

E.Coli Related Deaths and Injury
- 5 deaths
- 200 people made ill
- From Romaine lettuce in 2018
- CDC/FDA response- Ban consumption and pull from shelves romaine lettuce

Vaping Related Lung injury
- 26 deaths to date
- More than 1000 cases of severe illness as of September 2019
- CDC/FDA response- Stern warning to stop using bootleg vaping liquids

E Cig E Hookahs Mods Vape Pens
Vaper Tank System Juul...
- Technology introduced in 1927 by Joseph Robinson to vaporize liquids for medicinal purposes
- Herbert Gilbert patented the Smokeless Non tobacco Cigarette in 1966- but not popular because cigarettes were COOL
- Hon Lik in China invented the modern e cig design
- Arrived in US markets in 2006

“Nicotine Addiction is a Pediatric Disease.”
90% of Adult smokers began smoking before the age of 18
2018 Report- 27.5% of graduating seniors report using Ecigs
Sleek Technology
A heating element attached to rechargeable battery with a tank to hold the liquid and wick to deliver liquid to heating element, just add a mouth piece. Heat the liquid to more than 400 Degrees F to vaporize or aerosolize the liquid.

Are they all the Same?
Vaping
- Nicotine as free base in solution
- Can burn the throat/harsh
- Less concentrated
- Can aerosolize other drugs or substances- THC

Juuling
- Nicotine Salts
- Protonated salts are less harsh
- Allow user to inhale deeper, absorber more readily
- Can be concentrated more

Vape Pens

Juul

A new Generation of Pods

Why Juul Wins
- Juul pod contains the equivalent nicotine between 1-2 packs of cigarettes in 200 puffs
- 5% concentration of Nicotine in the US
- Europe and other countries limit the pod concentrations to less than 2%
- USB charging
- Small easily concealed
- Pleasant smell and taste
Juul (Big Tobacco Philip Morris) Hit the Scene in 2015
Focus and Targeted Teen Marketing on Social Media
Instagram Influencers
Launch Parties

Exchange One Epidemic for Another
• JUUL has grown over 700% since 2015
• Now accounts for 70% of eCig market
• Removed Social Media Accounts in Nov 2018
• Hired a Pediatrician with expertise in Nicotine Addiction Spring 2019- Dr. Mark Rubinstein
• Stopped Marketing in US Sept 2019

Why Do We Care
• Youth who use e-cigarettes are
  – more than 3.5 times more likely to use marijuana
  – More likely to use traditional cigarettes
  – Have increase in mood disorders
  – Gateway theory to other addictions

The TEEN Brain is more vulnerable to addiction: NEUROPLASTICITY

Stopping the Train...
• Two parts: Preventing new users
  » Helping those already addicted

• Legislation- changing the legal age to 21
  – Bans on Vaping, sales
• Grassroots efforts- in the schools, at home
  – Vapor detectors, cotinine screening

Nicotine Addiction
• Nicotine Replacement treatments
• Nicotine Receptor Antagonist
  – Bupropion (Wellbutrin, Zyban)
• Nicotine Receptor Partial Agonist
  – Varenicline (Chantix)

Vaping Related Lung Injury
• Lipoid Pneumonia- increased lipid laden macrophages on BAL
• Chemical Pneumonitis- from additives
  – Propylene glycol
  – Glycerin
  – Flavorings
  – Benzene
  – Formaldehyde
  – Nickel
  – Lead
  – Chromium
  – Vitamin E oil
  – Pesticide- myclobutanil converts to Hydrogen Cyanide at > 400°
What It Looks Like

• Intractable Vomiting
• Chest Pain
• Shortness of Breath
• CXR- ground Glass appearance
• Elevated WBC
• 78% report using THC containing vaping liquid

How and What to Report

1. If e-cigarette product use is suspected as a possible etiology of a patient’s severe pulmonary disease, obtain a detailed history regarding:
   - Substance(s) used;
   - Substance source(s);
   - Device(s) used;
   - Where the product(s) were purchased;
   - Method of substance use; and
   - Sharing of e-cigarette products with others.

2. Determine if any remaining product, including devices and liquids, is available for testing.

5. The CDC encourages the public to report any unexpected tobacco or e-cigarette-related health or product issues to the FDA online Safety Reporting Portal, http://www.safetyreporting.hhs.gov. The CDC’s health advisory also includes recommendations for public health officials and the public. The full detailed alert is available at https://emergency.cdc.gov/han/han00421.asp
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https://youtu.be/zVXR7xtUeo