# 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

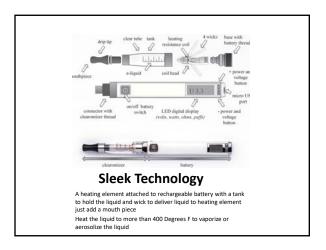


#### "Nicotine Addiction is a Pediatric Disease."

90% of Adult smokers began smoking before the age of 18 2018 Report- 27.5% of graduating Seniors report using Ecigs

# 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



# 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





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 Phillip 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
  - $-\,$  Pesticide- myclobutanil converts to Hydrogen Cyanide at > 400  $^{\circ}$

### 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

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.

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

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













# **CLOUD TRICKS**

https://youtu.be/zVXR7xttUeo