E-cigarettes, Vaping, and Juuling: Know the Risks

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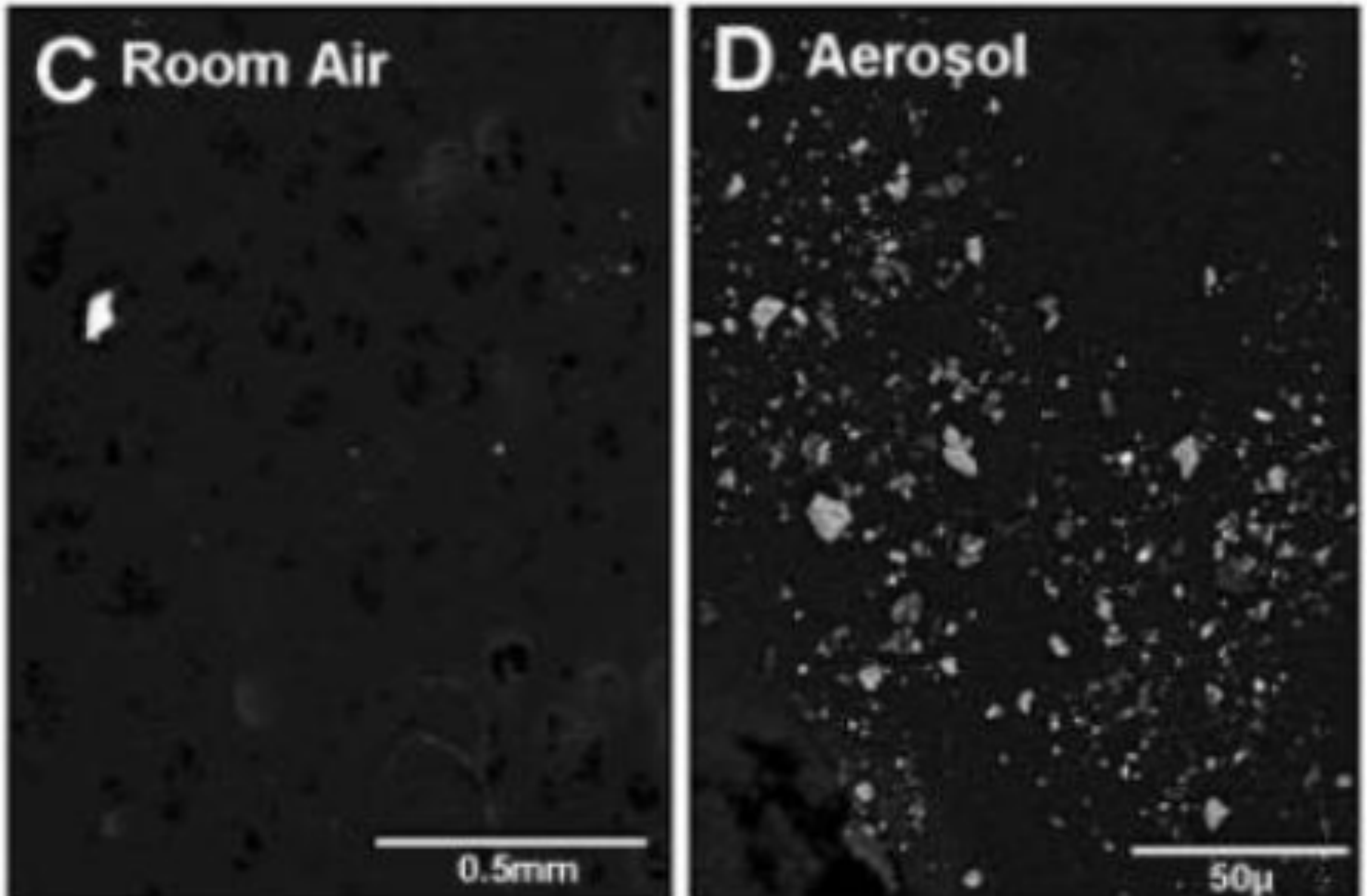
Parts of this presentation are based on the Middlesex Partnerships for Youth ”Vaping and Juuling” conference at Newton-Wellesley Hospital, Dec 2018

- Introduction to vaping products
  - To whom are e-cigarettes marketed?
- Health risks
- What can we do?
- Student Panel, Q & A

Vaping is NOT just inhaling flavored water vapor!!!



Particles in room air vs. e-cigarette vapor

SOURCE: Williams et. al, 2013

Beginning Vaping Products

Current Vaping Products

Suorin Drop
Ultra-Portable System
Element Vape

Small and sleek designs

Suorin Air Pod System

Bright and colorful

Suorin Vagon

Juuls

Do these look like fancy covers that most adults would purchase?

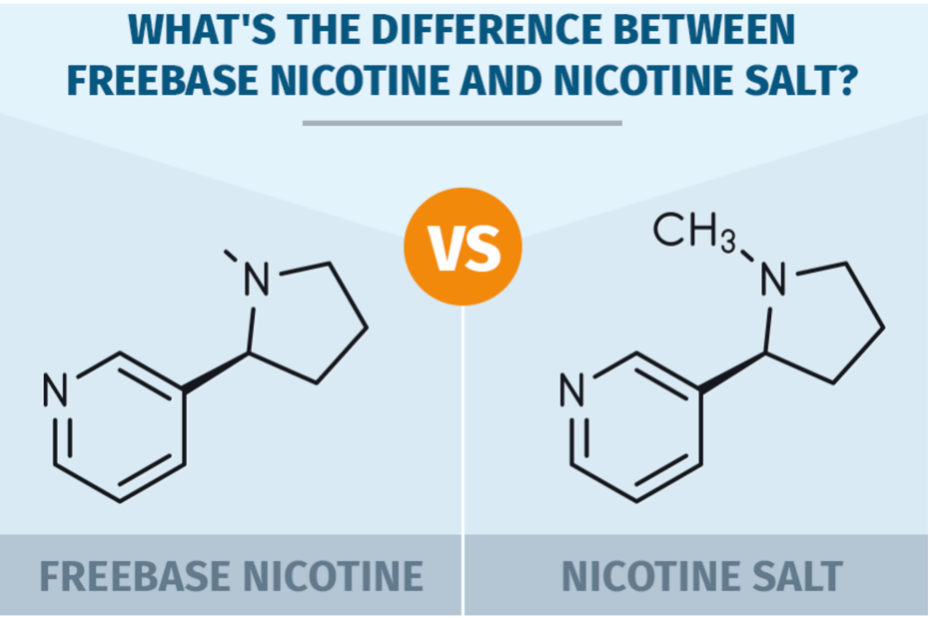
What’s actually in a Juul pod?

Just 5 ingredients:

- **Nicotine**
- **Propylene glycol**
- **Glycerin**
- **Benzoic acid**
- **Flavorings, oils**

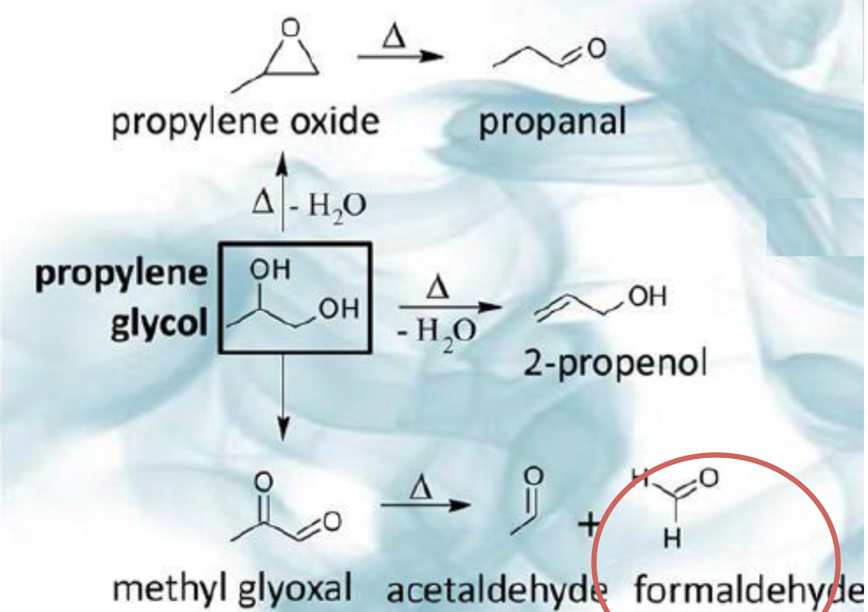
Let’s take a closer look at each ingredient…

Nicotine



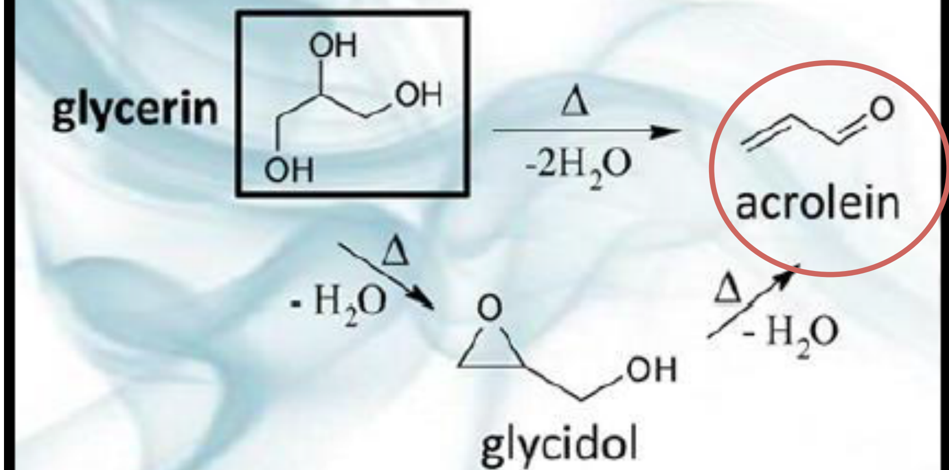
- Nicotine occurs naturally in plants as a nicotine salt.
- Phillip Morris treated this salt with ammonia to create stronger more addictive *freebase nicotine*.
- But, freebase nicotine is very acidic and harsh on the throat. Limited the vaping companies on nicotine levels.
- Juul uses benzoic acid to bring the nicotine salt levels up to 59 mg per pod while smooth on the throat.
- Average cigarette contains 2 mg of absorbed nicotine
- 1 Juul pod contains 59 + mg of nicotine = 1.5 pack of cigarettes!

Propylene glycol



Postulated pathways and by-products of propylene glycol thermal dehydration SOURCE: Sleiman et. al., 2016

Glycerin



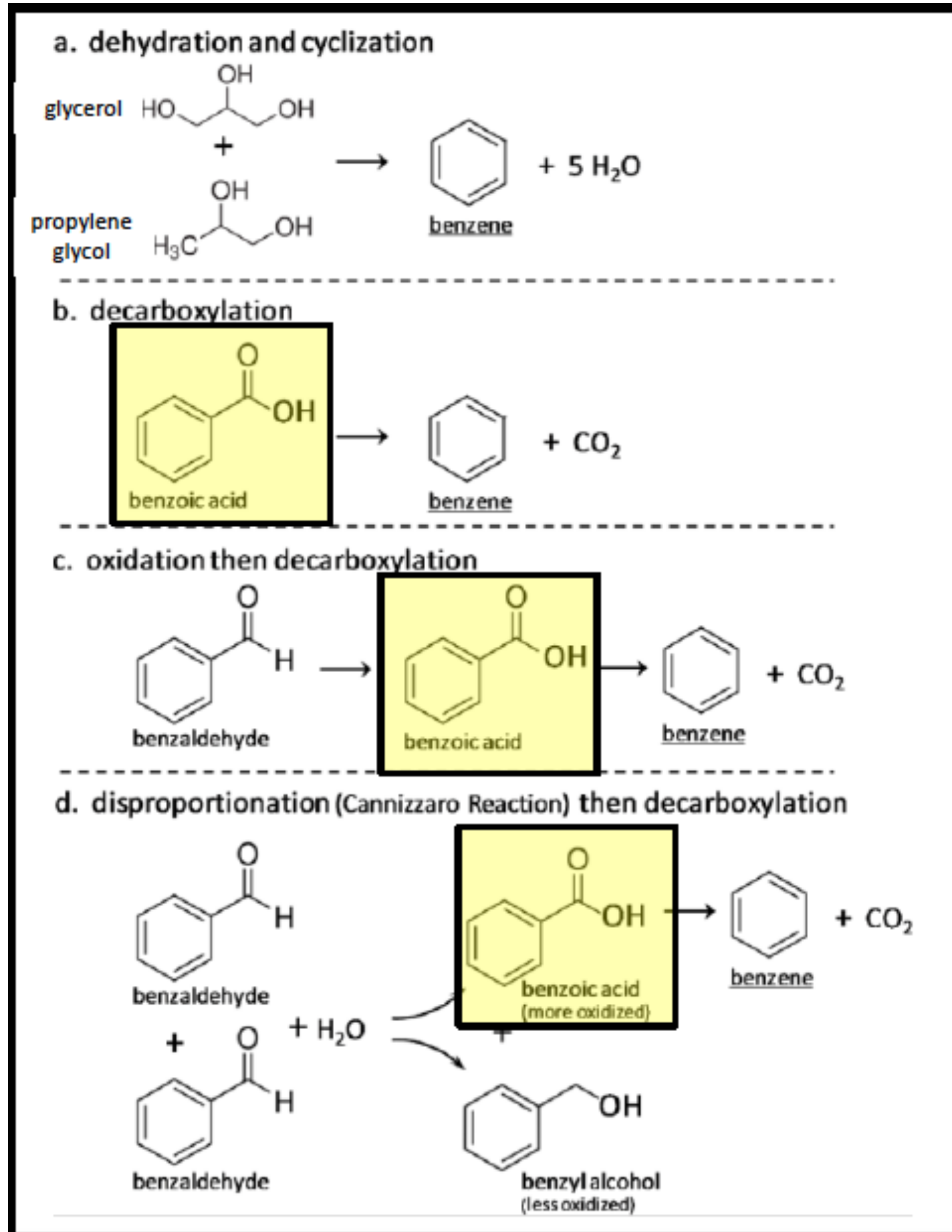
Postulated pathways and by-products of glycerin thermal dehydration SOURCE: Sleiman et. al., 2016

- **Both substances used as solvent and humectant for easy transport into the lungs.**
- **Mixture allows nicotine particles to be small enough for transfer while in an aerosol.**

Benzoic Acid

- Benzoic acid used to make nicotine salts easier on the throat = VERY strong pods!

- There are 4 different conditions that can produce BENZENE, a known carcinogen!



Formation of benzene SOURCE: Pankow et. al., 2017

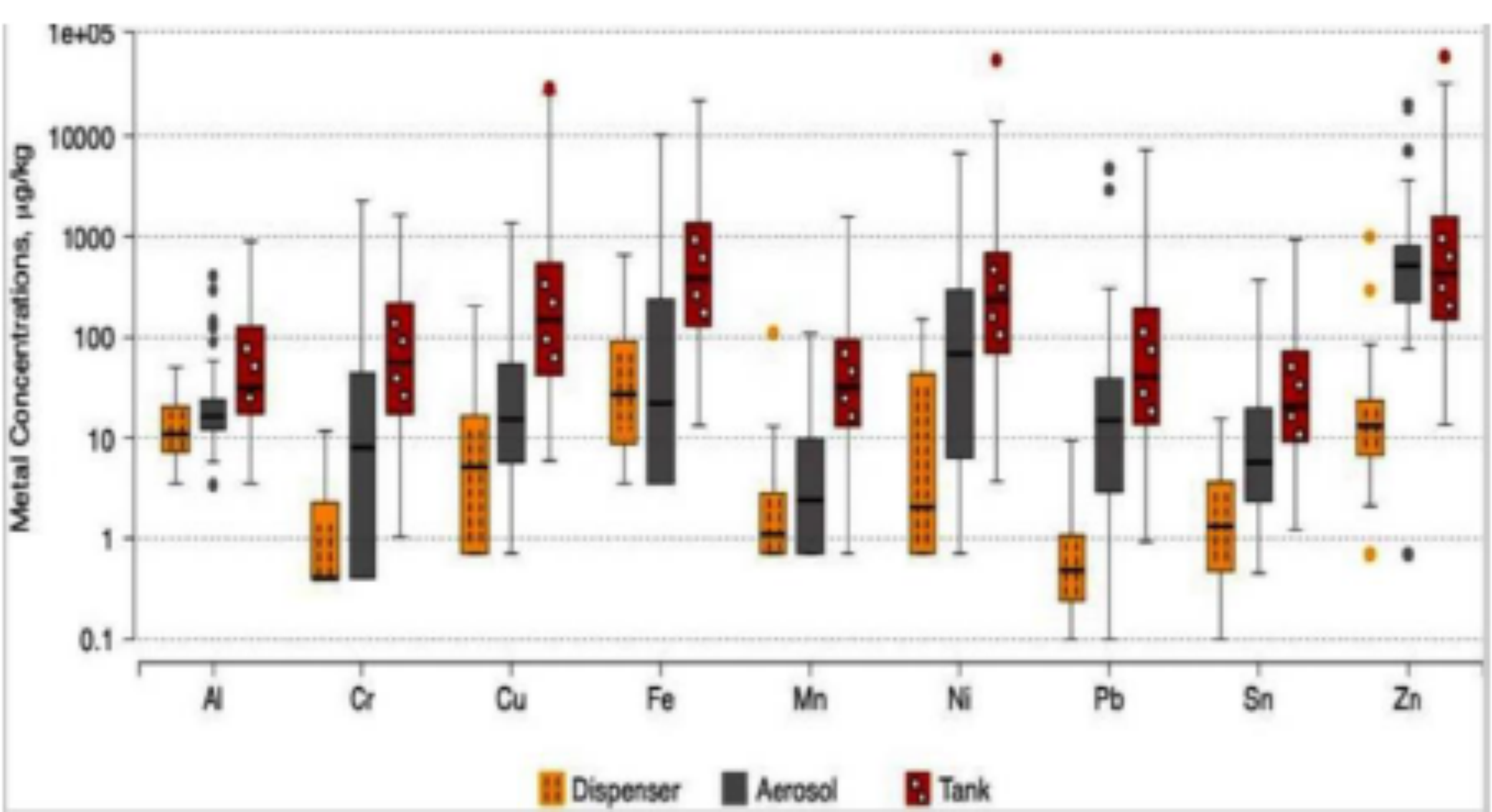
Flavorings, oils

- Look at the names of the first group. These are completely marketed to adolescents!
- Do we know what is in these “flavorings”?

Alien Blood	Double Apple Hookah	Oatmeal Cookie
Bad Apple	Energy Drink	Orange Mint
Bluewater Punch	Grape Hookah	Peach Schnapps
Carmel Popcorn	Iced Berry	Pina Colada
Cherry Lava	Java Jolt	Pomegranate
CooCoo Coconut	Just Guava	Snap!
Cotton Candy	Kick!	Tutti Frutti
Cupcake	Menthol	Vanilla Bean

1-hexanol	cyclotene	limonene
2,3-pentanedione	decan-4-olide	linalool
2,5-dimethylpyrazine	decanaldehyde	linalyl acetate
2,6-lutidine	Diacetyl	maltol
2-acetylpyrrole	diethyl succinate	Menthol
3,4-dihydrocoumarin	ethyl acetoacetate	menthone
3-hexen-1-ol	ethyl hexanoate	methyl acetate
4-Butyrolactone	ethyl lactate	methyl cinnamate
5-methyl-2-furfural	ethyl maltol	methyl salicylate
acetoin	Ethyl Salicylate	methylheptenone
alpha-terpineol	ethyl vanillin	Nicotine
anisyl acetate	Eucalyptol	n-pentanol
benzaldehyde	Eugenol	Pulegone
benzyl acetate	Furaldehyde	pyridine
Benzyl Alcohol	furaneol	raspberry ketone
Camphor	furfuryl alcohol	tetramethylpyrazine
Cinnamaldehyde	gamma-valerolactone	vanillin
citronellol	isoamyl acetate	

Vaping heats up a metal coil



Metals in e-cigarette liquids and vapors

SOURCE: Olmedo et. al., 2018

What can we do?

- **Provide education**
  - Just Think Expo
  - Parent programs hosted by PTSO in 2018, 2017
- **Talk to your kids**
  - It's not just water vapor!
  - Nicotine is highly addictive, hard to kick the habit
  - Ask your kids: What would the consequences be for the future?
  - Let them know you will be there if they want to talk.
- **Look for warning signs**
  - Used pods
  - New aromas, sweet smell
  - Change of behavior, isolation

Getting help

- Nicotine addiction is treatable
- Make appointment with Ms. Malkin
- Using alternative strategies/stress relievers such as stress balls, chewing gum, straw, activity, keeping busy/ occupied ,delaying vaping, drinking water (not carbonated)
- Speak with pediatrician

- Getting rid of anything related to vaping
- Giving positive reinforcement to your child
- Do things together with your child
- Substance cessation group/therapy group
- Individual counseling
- It’s hard to kick, but it’s DOABLE!
- WE NEED TO SEND THE SAME MESSAGE AT SCHOOL AND HOME…IT’S A SAFETY ISSUE!