



UNIVERSITY *of* MARYLAND  
SCHOOL OF MEDICINE

# Clinical Approach to Youth Vaping

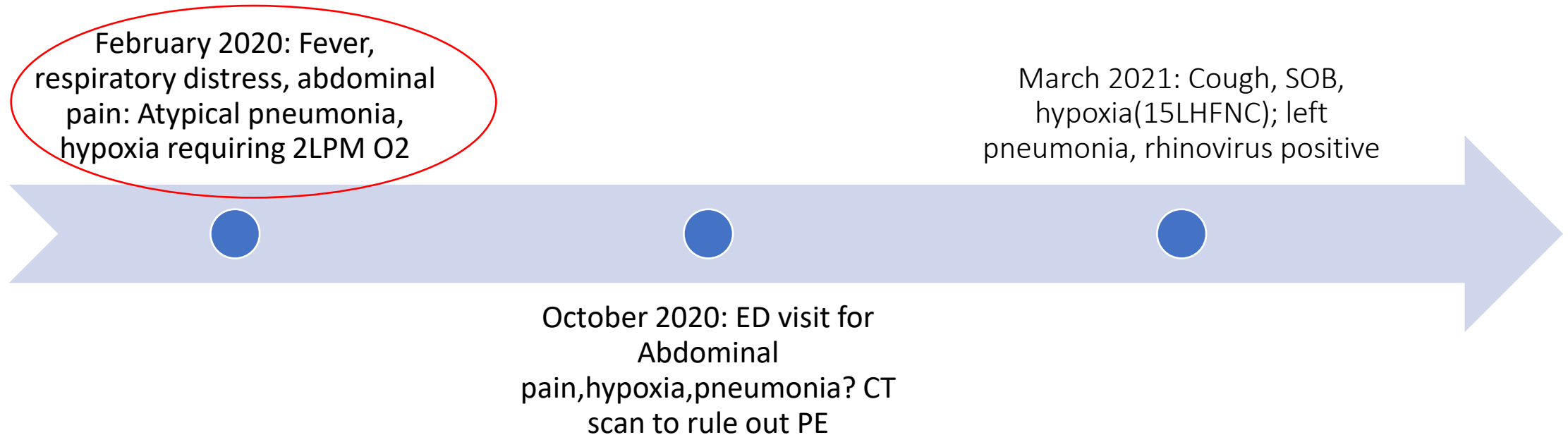
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# Case scenario: Timeline of events

17-year-old Male with history of depression presents with fever, respiratory distress and abdominal pain



# Imaging(Chest X Ray): Feb 2020

Increased interstitial markings

Diagnosed with Atypical pneumonia

No causative organism found

Treated with Azithromycin and Ceftriaxone




# Case scenario: Timeline of events

17-year-old Male with history of depression presents with fever, respiratory distress and abdominal pain

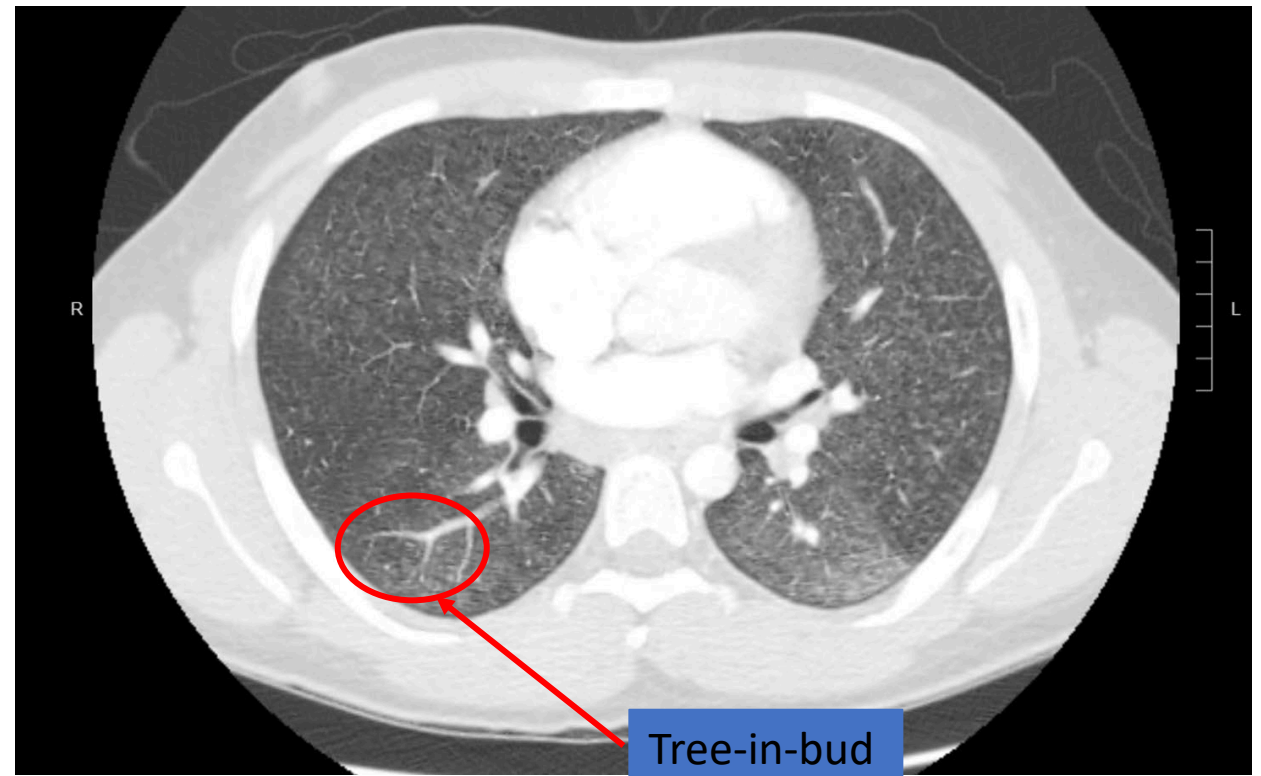
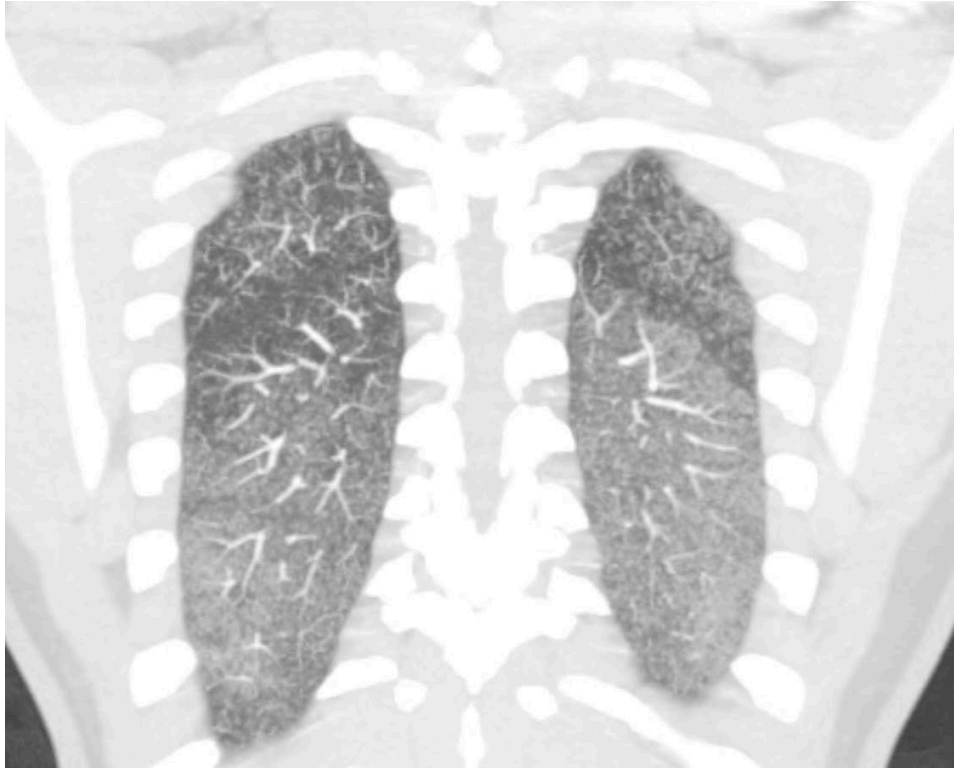
February 2020: Fever,  
respiratory distress, abdominal  
pain: Atypical pneumonia,  
hypoxia requiring 2LPM O2

March 2021: Cough, SOB,  
hypoxia(15LHFNC); left  
pneumonia, rhinovirus positive



October 2020: ED visit for  
Abdominal  
pain, hypoxia, pneumonia? CT  
scan to rule out PE

# Imaging: Chest CT Scan: October 2020



Diffuse increased ground glass /increased interstitial markings in lower lung fields  
Tree-in-bud appearance along lateral margin of the lungs

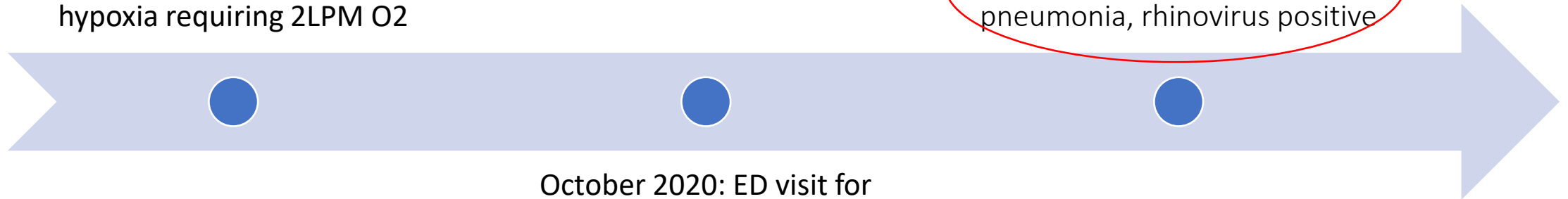
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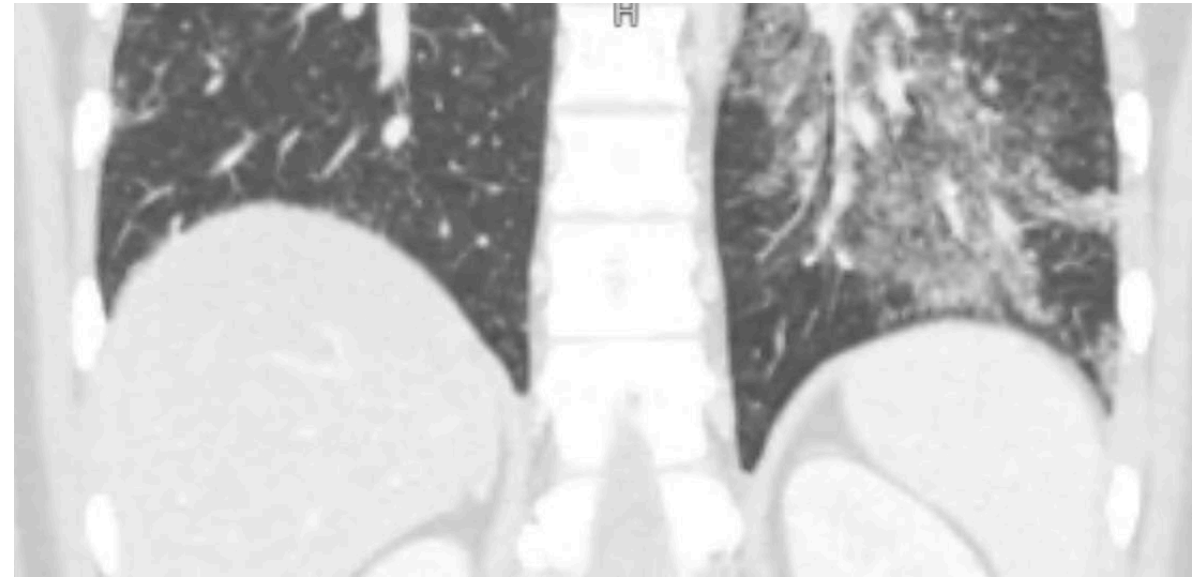
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# Imaging: Chest CT Scan: March 2021

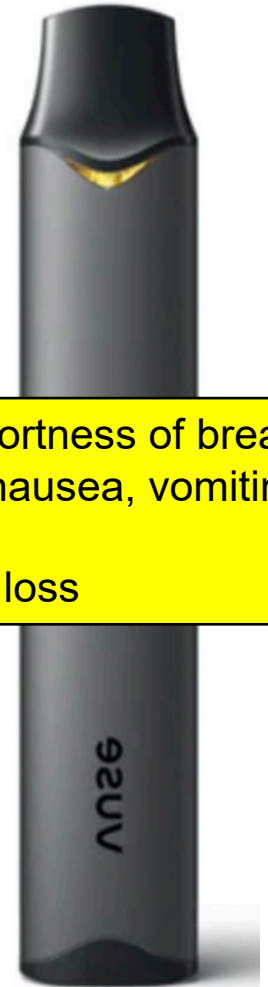


Ground glass and airspace opacities in lung bases, left greater than right.  
Appendix thickening possible early appendicitis?

# History:

- History of using Vuse for 3 years
- Vaping daily (5% nicotine) from approximately August 2019- March 2021.
- Started smoking marijuana in mid-2020
- No previous history of asthma, no family history
- History of depression on Prozac
- Diagnosed with E-cigarette Vaping Associated Lung injury (EVALI) after 3rd admission
- Treated with prednisone taper along with Ceftriaxone and Azithromycin

Respiratory- cough, chest pain, shortness of breath  
Gastrointestinal- abdominal pain, nausea, vomiting, diarrhea, or  
Constitutional- fever, chills, weight loss





# Case definitions: EVALI

Confirmed Case	Probable Case
Use of E-cigarette("vaping") or dabbing during the 90days before symptom onset AND	Use of E-cigarette("vaping") or dabbing during the 90days before symptom onset AND
Presence of pulmonary infiltrates such as opacities on chest X ray or Ground glass opacities on CT scan	Presence of pulmonary infiltrates such as opacities on chest X ray or Ground glass opacities on CT scan
Absence of pulmonary infection on initial work up: Negative viral PCR AND Negative testing on other infectious work up	Presence of infection identified on culture or PCR but infection cannot explain sole cause of lung injury
No evidence or medical record of alternate plausible diagnosis (cardiac, rheumatologic or neoplastic)	

# Transition to outpatient

**March-July 2021:** Penn State Electronic Cigarette Dependence= 4 (Low dependence) Text-based and Online resources provided, refused nicotine patch

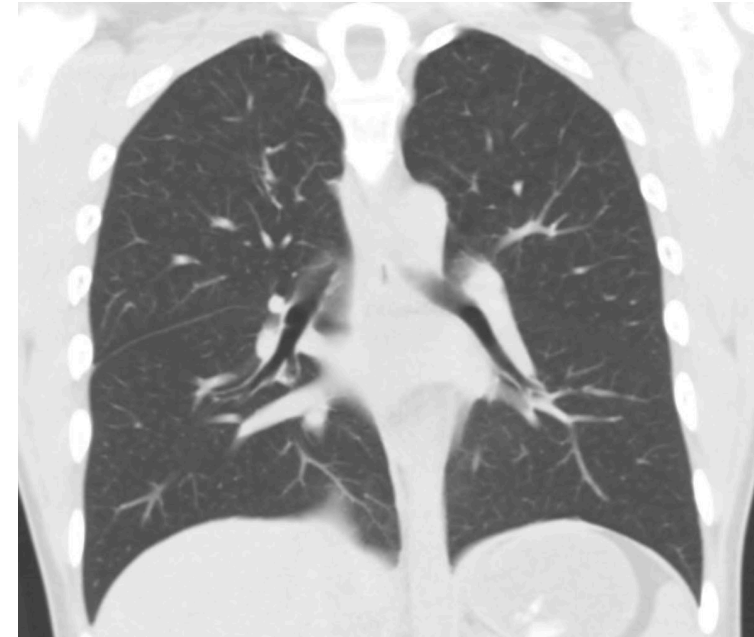
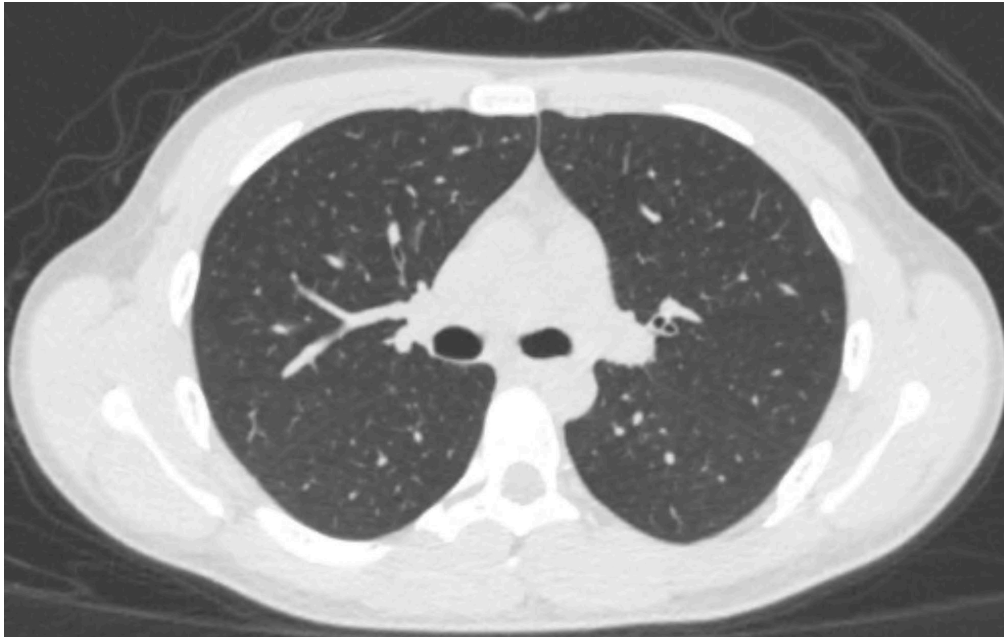
**Jan 2022:** Unintentional weight loss, stopped all inhalers. Persistent marijuana use

**Sept 2022:** Patient stopped using vape/E-cigarettes but continued smoking marijuana

**Nov 2021:** Stopped vaping, continued smoking marijuana

**August 2022:** Restarted vaping. Prescribed nicotine patch and gum to use for cravings

# Imaging: Chest CT Scan: January 2022

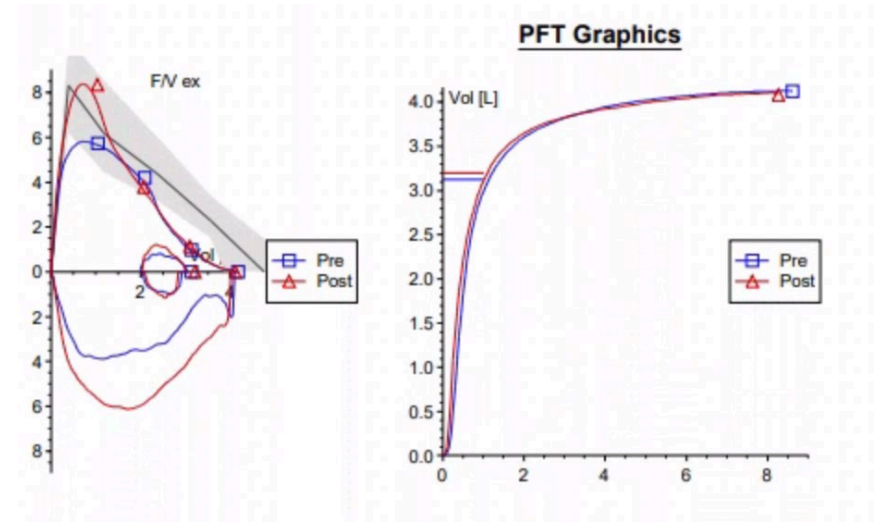


Resolution of previous ground glass opacities

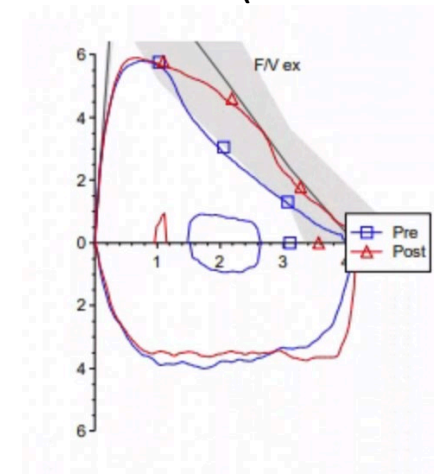
Mild bronchial wall prominence and scattered air trapping, post inflammatory changes.

# Pulmonary function testing

Timeline	FEV1/FVC ratio	Diffusion Capacity
March 2021	75	N/A
July 2021	70	70% predicted
January 2022	70	76% predicted
August 2022	76	73% predicted



PFT( March 2021)



PFT(August 2022)

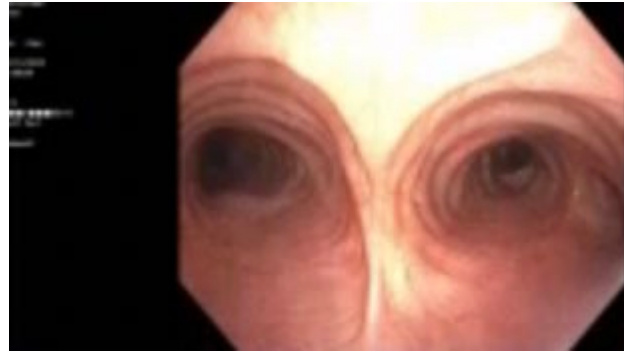
# Bronchoscopy

Anatomically normal airways  
and branching

Airway mucosa normal, no  
inflammation

BAL Cytopathology:

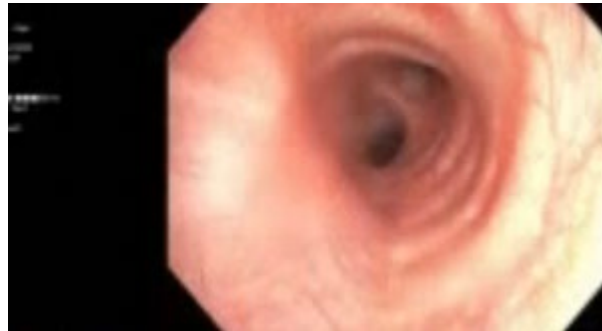
- Alveolar macrophages and bronchial epithelial cells
- Positive Oil Red O for lipid laden macrophages
- No fungal elements



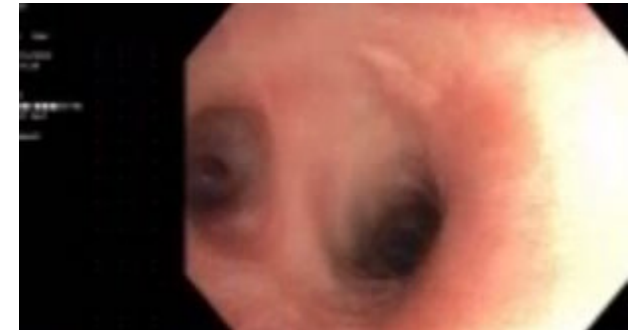
Carina



Right upper lobe



Left mainstem bronchus



Left lower lobe

Patient encounters for  
vaping cessation

# Screening tools

- CRAFFT:  
Car, Relax, Alone, Forget, Friends,  
Trouble
- Sensitivity of 96% and specificity  
of 81% for detecting past-12-  
month use of any substance
- Inclusion of the Hooked-On  
Nicotine Checklist (HONC)

## The CRAFFT+N Questionnaire

To be completed by patient

Please answer all questions **honestly**; your answers will be kept **confidential**.

**During the PAST 12 MONTHS, on how many days did you:**

1. Drink more than a few sips of beer, wine, or any drink containing alcohol? Put "0" if none.  # of days

2. Use any **marijuana** (cannabis, weed, oil, wax, or hash by smoking, vaping, dabbing, or in edibles) or "**synthetic marijuana**" (like "K2," "Spice")? Put "0" if none.  # of days

3. Use **anything else to get high** (like other illegal drugs, pills, prescription or over-the-counter medications, and things that you sniff, huff, vape, or inject)? Put "0" if none.  # of days

4. Use a **vaping device\*** containing nicotine and/or flavors, or use any **tobacco products**†? Put "0" if none.  # of days  
*\*Such as e-cigs, mods, pod devices like JUUL, disposable vapes like Puff Bar, vape pens, or e-hookahs. †Cigarettes, cigars, cigarillos, hookahs, chewing tobacco, snuff, snus, dissolvables, or nicotine pouches.*

### READ THESE INSTRUCTIONS BEFORE CONTINUING:

- If you put "0" in ALL of the boxes above, ANSWER QUESTION 5 BELOW, THEN STOP.
- If you put "1" or more for Questions 1, 2, or 3 above, ANSWER QUESTIONS 5-10 BELOW.
- If you put "1" or more for Question 4 above, ANSWER ALL QUESTIONS ON BACK PAGE.

## The Hooked on Nicotine Checklist

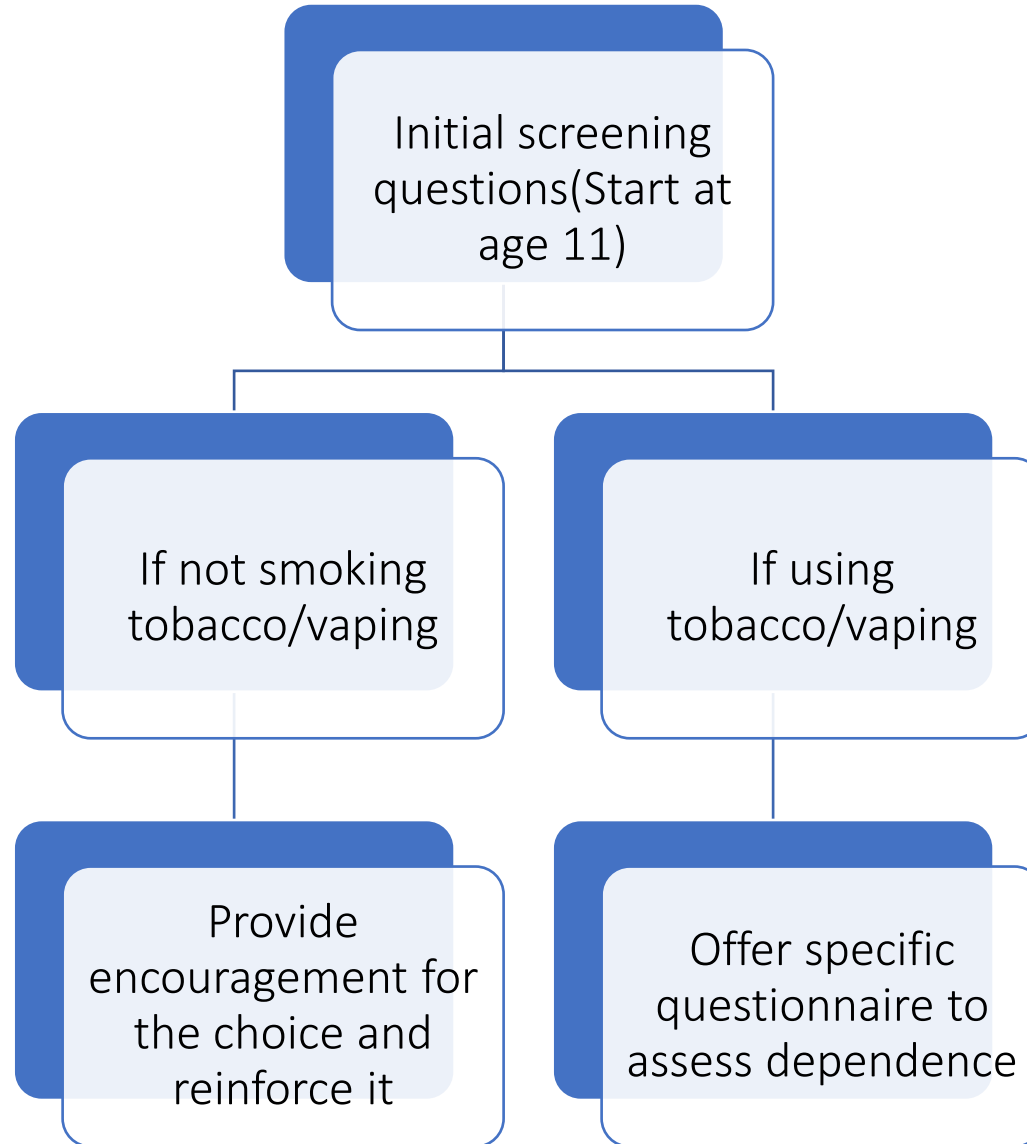
The HONC is scored by tallying the number of yes responses, from 0-10. Any score greater than zero indicates that the smoker has lost some degree of autonomy over their smoking.

This indicates that nicotine addiction has begun.

- Only developed for adolescents
- Positive score indicates loss of autonomy and onset of dependence
- Norms based on American adolescents (ages 14-15, 9th grade)

	YES	NO
<b>1) Have you ever tried to stop vaping, but couldn't?</b>		
<b>2) Do you vape <u>now</u> because it is really hard to quit?</b>		
<b>3) Have you ever felt like you were addicted to vaping?</b>		
<b>4) Do you ever have strong cravings to vape?</b>		
<b>5) Have you ever felt like you really needed to vape?</b>		
<b>6) Is it hard to keep from vaping in places where you are not supposed to, like school?</b>		
<b>When you tried to stop vaping...(or, when you haven't vaped for a while...)</b>		
<b>7) did you find it hard to concentrate because you couldn't vape?</b>		
<b>8) did you feel more irritable because you couldn't vape?</b>		
<b>9) did you feel a strong need or urge to vape?</b>		
<b>10) did you feel nervous, restless or anxious because you couldn't vape?</b>		





# Penn State Electronic Cigarette Dependence Index

Client/patient name \_\_\_\_\_

Date \_\_\_\_\_

0-3= not dependent  
 4-8= Low dependence  
 9-12=Medium dependence  
 13+=High dependence

	Answer	Score
<b>1. How many times per day do you usually use your electronic cigarette? (assume that one "time" consists of around 15 puffs or lasts around 10 minutes)</b>		
<i>Scoring: 0-4 times/day = 0, 5-9 = 1, 10-14 = 2, 15-19 = 3, 20-29 = 4, 30+ = 5</i>		
<b>2. On days that you can use your electronic cigarette freely, how soon after you wake up do you first use your electronic cigarette?</b>		
<i>Scoring: 0-5 mins = 5, 6-15 = 4, 16-30 = 3, 31-60 = 2, 61-120 = 1, 121+ = 0</i>		
<b>3. Do you sometimes awaken at night to use your electronic cigarette?</b>		
<i>Scoring: Yes = 1, No = 0</i>		
<b>4. If yes, how many nights per week do you typically awaken to use your electronic cigarette?</b>		
<i>Scoring: 0-1 nights = 0, 2-3 nights = 1, 4+ nights = 2</i>		
<b>5. Do you use an electronic cigarette now because it is really hard to quit (electronic cigarettes)?</b>		
<i>Scoring: Yes = 1, No = 0</i>		
<b>6. Do you ever have strong cravings to use an electronic cigarette?</b>		
<i>Scoring: Yes = 1, No = 0</i>		
<b>7. Over the past week, how strong have the urges to use an electronic cigarette been?</b>		
<i>Scoring: None/Slight = 0, Moderate/Strong = 1, Very Strong/Extremely Strong = 2</i>		
<b>8. Is it hard to keep from using an electronic cigarette in places where you are not supposed to?</b>		
<i>Scoring: Yes = 1, No = 0</i>		
<b>When you haven't used an electronic cigarette for a while or when you tried to stop using...</b>		
<b>9. Did you feel more irritable because you couldn't use an electronic cigarette?</b>		
<i>Scoring: Yes = 1, No = 0</i>		
<b>10. Did you feel nervous, restless, or anxious because you couldn't use an electronic cigarette?</b>		
<i>Scoring: Yes = 1, No = 0</i>		
<b>Total</b>		

Total scoring: 0-3= not dependent,  
 4-8 low dependence,  
 9-12 medium dependence,  
 13+ = high dependence.

# Modified Fagerstrom Tolerance Questionnaire

- 0-2 = no dependence
- 3-5 = moderate dependence
- 6-9 = substantial dependence

## **Modified Version of the Fagerstrom Tolerance Questionnaire (mFTQ)**

(Scoring guidelines in parentheses; remove these from instrument prior to use).

1. How many cigarettes a day do you smoke?
  - a. Over 26 cigarettes a day (2)
  - b. About 16-25 cigarettes a day (1)
  - c. About 1-15 cigarettes a day (0)
  - d. Less than 1 a day (0)
2. Do you inhale?
  - a. Always (2)
  - b. Quite often (1)
  - c. Seldom (1)
  - d. Never (0)
3. How soon after you wake up do you smoke your first cigarette?
  - a. Within the first 30 minutes (1)
  - b. More than 30 minutes after waking but before noon (0)
  - c. In the afternoon (0)
  - d. In the evening (0)
4. Which cigarette would you hate to give up?
  - a. First cigarette in the morning (1)
  - b. Any other cigarette before noon (0)
  - c. Any other cigarette afternoon (0)
  - d. Any other cigarette in the evening (0)
5. Do you find it difficult to refrain from smoking in places where it is forbidden (church, library, movies, etc.)?
  - a. Yes, very difficult (1)
  - b. Yes, somewhat difficult (1)
  - c. No, not usually difficult (0)
  - d. No, not at all difficult (0)
6. Do you smoke if you are so ill that you are in bed most of the day?
  - a. Yes, always (1)
  - b. Yes, quite often (1)
  - c. No, not usually (0)
  - d. No, never (0)
7. Do you smoke more during the first 2 hours than during the rest of the day?
  - a. Yes (1)
  - b. No (0)

# Other clinical support tools

- Americal Academy of Pediatrics
- Tobacco cessation App: Ask-Counsel-Treat Model

**I find myself reaching for my e-cigarette without thinking about it.**

Required

-Select an option-



**I drop everything to go out and get e-cigarettes or e-juice.**

Required

-Select an option-



**I vape more before going into a situation where vaping is not allowed.**

Required

-Select an option-



**When I haven't been able to vape for a few hours, the craving gets intolerable.**

Required

-Select an option-



# AAP Tobacco cessation App

Pharmacologic Treatment for **Moderate Dependency**

*For best results, pair a long-acting NRT (patch) with a shorter-acting form (e.g., gum, lozenge).*

Nicotine Gum Dosage: **2mg**

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**Use Instructions**



Nicotine Patch Dosage: **Start with 14mg patch, then step down**

**Use Instructions:**

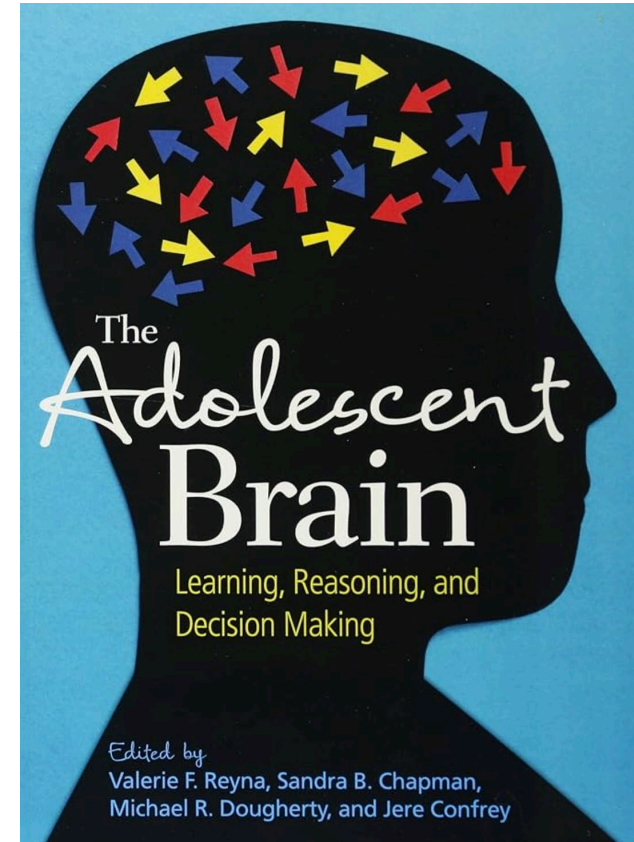


# History elements in a tobacco/vaping patient

- Use- How much do you use, vape/cigarettes per day, routine of vaping throughout the day, brands of vape used, % nicotine and flavorings, potential associations around which the use happens
- Smoke inside or outside the home, ask patient to explain scenarios
- Past- Past quitting attempts, timing , what was used
- Psychiatric history- depression, stress level
- S-Substance abuse- Other drugs being used
- T- Current environmental triggers-college, boredom, stress, other smokers

# Tobacco use discussion with adolescent

- Ensure privacy, ask parent/siblings to step out of the room
- 3 counseling concepts
  - Getting the backstory
  - Developing a therapeutic relationship
  - Understanding how adolescents learn new ideas
- Let teenagers be themselves
- Show constancy of interest and support
- Suspension of moral judgement
- Refrain from using scare tactics



# Approach

**Be Clear:** Tell your patient that you're worried about them

***“I’m really concerned about you, and I strongly advise you to stop E-cigarettes.”***

**Be Specific:** Emphasize the health effects

***“Your brain is still developing, which means you can get addicted to nicotine faster and more easily than an adult would. I don’t want you to become dependent on e-cigarettes.”***



# Messages that may resonate with teens

Impact of vaping on breathing and athletic performance

Expense of e-cigarette products

Tobacco Industry's history of deceitful marketing practices to attract teen users

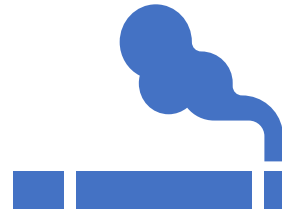
Reasons for not using combustible cigarettes and linking that to e-cigarette use



# Management: (Moderate to severe dependence)



Counseling



Nicotine replacement  
therapy



Follow up visits

# Motivational Interviewing

- Empathy: The provider should be non-judgmental and use listening instead of lecturing.
- Accept Ambivalence: Accurately understanding the patient point of view
- Develop discrepancy. Assist the patient in identifying a difference between their behavior and desired change.
- Avoid argumentation. Discouraged patients will tell a provider what they want to hear.
- Roll with resistance. Reframe the patient's statements to help them consider alternative.
- Support self-efficacy. Provide encouragement to increase the patient's self-confidence in their ability to change behavior.

In this process the provider explores and helps the patient to build their own "why"

# Nicotine Replacement Therapy(NRT) in adolescents

- Pharmacotherapy works best when coupled with behavioral counseling interventions.
- FDA has not approved NRT for youth under 18 years old
- No evidence of serious harm from using NRT in adolescents under 18 years old
- American Academy of Pediatrics recommends that pediatricians consider off label use of NRT for youth who are moderately or severely addicted to nicotine and motivated to quit
- For best results, patients should be advised to pair a long-acting form of NRT (example; nicotine patch) with a shorter-acting form (eg, gum, lozenge, spray, or inhaler)

# Forms of NRT

Form of NRT	Level of Dependence	
	Moderately Addicted	Severely Addicted
Nicotine Gum	2mg	4mg
Nicotine Patch	Start with 14mg patch, then step down	Start with 21mg patch, then step down
Nicotine Lozenge	2mg	4mg



# NRT use guidelines

<p><b>Nicotine Transdermal Patch</b> (OTC for 18+ Rx for &lt;18)</p> <p>Cost: Over-the-counter retail cost ranges from \$25-\$70 for 28 patches.</p> <p>Out-of-pocket prescription costs will vary by insurance plan.</p>	<p><b>Dosage:</b></p> <ul style="list-style-type: none"><li>• 21mg, 14mg, 7mg</li></ul> <p><b>Use Instructions:</b></p> <ul style="list-style-type: none"><li>• Apply patch to clean skin, change patch every 24 hours</li><li>• 8-10 week treatment regimen:<ul style="list-style-type: none"><li>○ Use first dose for 6 weeks, then “step down” to lower dose</li><li>○ Use lower dose for 2 weeks, then “step down” to lowest dose for 2 more weeks</li></ul></li><li>• See package for full details</li></ul> <p><b>Side Effects:</b></p> <ul style="list-style-type: none"><li>• Skin Irritation, sleep disturbance</li></ul> <p><b>Advantages:</b></p> <ul style="list-style-type: none"><li>• Sustained blood levels of nicotine, compliance is relatively easy</li></ul>
<p><b>Nicotine Gum</b> (OTC for 18+ Rx for &lt;18)</p> <p>Cost: Over-the-counter retail cost ranges from \$17-\$50 for 100 pieces of gum.</p> <p>Out-of-pocket prescription costs will vary by insurance plan.</p>	<p><b>Dosage:</b></p> <ul style="list-style-type: none"><li>• 4mg, 2mg</li></ul> <p><b>Use Instructions:</b></p> <ul style="list-style-type: none"><li>• “Chew and park” method:<ul style="list-style-type: none"><li>○ Place the gum in your mouth and chew until you feel a tingling sensation</li><li>○ Stop chewing and “park” the gum between cheek and gums</li><li>○ After about a minute, start chewing again, until you feel a tingling sensation</li><li>○ Stop chewing and “park” the gum again</li><li>○ Repeating for about 30 minutes</li></ul></li><li>• 12-week treatment regimen:<ul style="list-style-type: none"><li>○ Chew 1 piece every 1-2 hours for first 6 weeks</li><li>○ Chew 1 piece every 2-4 hours for 3 additional weeks</li><li>○ Chew 1 piece every 4-8 hours for 3 additional weeks</li></ul></li></ul>

# Recommendations for parents who use Tobacco

- Never smoke or use e-cigarettes in the house, car.
- Talk with your doctor about ways to help you quit tobacco products
- Talk to your children about the dangers of tobacco and e-cigarettes
- Always keep e-cigarettes and liquid nicotine locked and out of reach of children and adolescents

# Resources to teens and families

## Behavioral Support Options:

- Text: Text "QUIT" to 47848
- Online: [teen.smokefree.gov](http://teen.smokefree.gov)
- Phone: 1-800-QUIT-NOW
- Text DITCHVAPE to 88709
- Full List of Program Options: [www.aap.org/help2quit](http://www.aap.org/help2quit)



# Clinical documentation and billing

99406 and 99407 can be used for smoking and vaping cessation counseling.

99406 and 99407 are time-based codes.

The time of the tobacco cessation counseling must be recorded in the note.

A -25 modifier would need to be applied to the E/M code.

You cannot report tobacco cessation codes 99406-99407 under the child when counseling the parent.

- 99406 = 3-10 minutes
- 99407 = > 10 minutes



# UNIVERSITY *of* MARYLAND SCHOOL OF MEDICINE

Thank you

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# References

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3. [https://downloads.aap.org/AAP/PDF/NRT and Adolescents Pediatrician Guidance factsheet.pdf](https://downloads.aap.org/AAP/PDF/NRT_and_Adolescents_Pediatrician_Guidance_factsheet.pdf)
4. [https://www.cdc.gov/nssp/php/story/surveillance-provides-clues-vaping-lung-injury.html#:~:text=Beginning%20in%20summer%202019%2C%20state,associated%20lung%20injury%20\(EVALI\).](https://www.cdc.gov/nssp/php/story/surveillance-provides-clues-vaping-lung-injury.html#:~:text=Beginning%20in%20summer%202019%2C%20state,associated%20lung%20injury%20(EVALI).)
5. <https://www.aap.org/en/learning/e-cigarette-curriculum/>