



Nicotine, not snuffed out

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Faculty Disclosure

- I do not have anything to disclose

Educational Need/Practice Gap

- Currently most tobacco using patients get minimal guidance on smoking cessation
- Hospitalists are not comfortable treating tobacco dependence

Learning Objectives

- Upon completion of this lecture, you will be able to apply different treatment modalities to successfully treat tobacco dependence

Expected Outcome

- More involvement in treating tobacco dependence than NRT prn



Case

- 54 yo man with HTN, COPD, CAD is admitted for spinal osteomyelitis
- He is frequently off the floor to smoke
 - Unavailable for consultant evaluation
 - Frustrated nursing staff
 - Late antibiotic admin
 - Overall obstructive to care

History

- *Nicotiana tabacum* & *Nicotiana rustica*
- Native of Americas: Andes Peru/Ecuador
- Cultivated since 5000-3000 BC and universal at the time of Columbus



History

- Early Uses
 - Snuffing, smoked, chewed, eaten, tea, smeared, eye drops, enemas
 - Analgesic and antiseptic
 - Insecticide in agriculture
 - Religious ceremonies

History

- Europeans thought evil and harmful but with purported medicinal properties eventually brought to Europe
- Sir Walter Raleigh brought tobacco back from Virginia in 1586



History

- Manufactured cigarettes 1850s made smoking more convenient
- World War 1 further popularized
- Primary nicotine delivery system since
- Major cash crop in Kentucky
 - Still has most tobacco farms in the US

Cost

- Leading cause of preventable disease, disability and death in the USA
- **8,900** adults died from smoking related illnesses each year
- **\$1.9 billion** was spent on healthcare costs due to smoking in 2009

KY Tobacco Related Disparities

- Smoking prevalence 21.4% in KY
 - 24.3% among adults "having any disability"
 - 24.7% among adults "less than high school"
 - 32.5% among adults "unemployed"
 - 35.2% among adults "less than \$20,000"
 - 25.2% among adults "severe mental distress"

Vaping in Kentucky

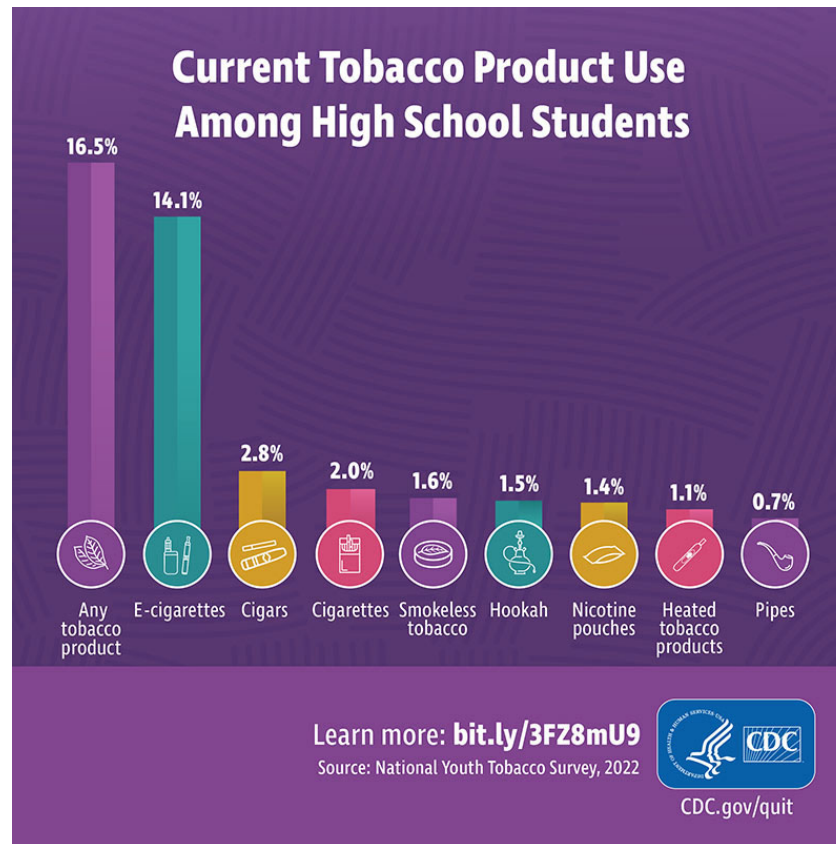
- **29.7%** of KY High school youth reported using any tobacco product including e-cigarettes.
 - **8.9%** currently smoking cigarettes



Vaping in Kentucky

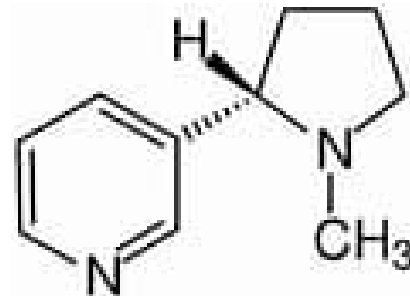
- 6% KY adults vape daily
 - TN and WV also have very high rates
- 17.9% of young adults vape daily
- 11.6% of young adults some days

Youth Tobacco Use



Why?

- Smoking
 - Immediate access to brain
 - Large surface area of resp epithelium
 - Rapid absorption, thus more addictive

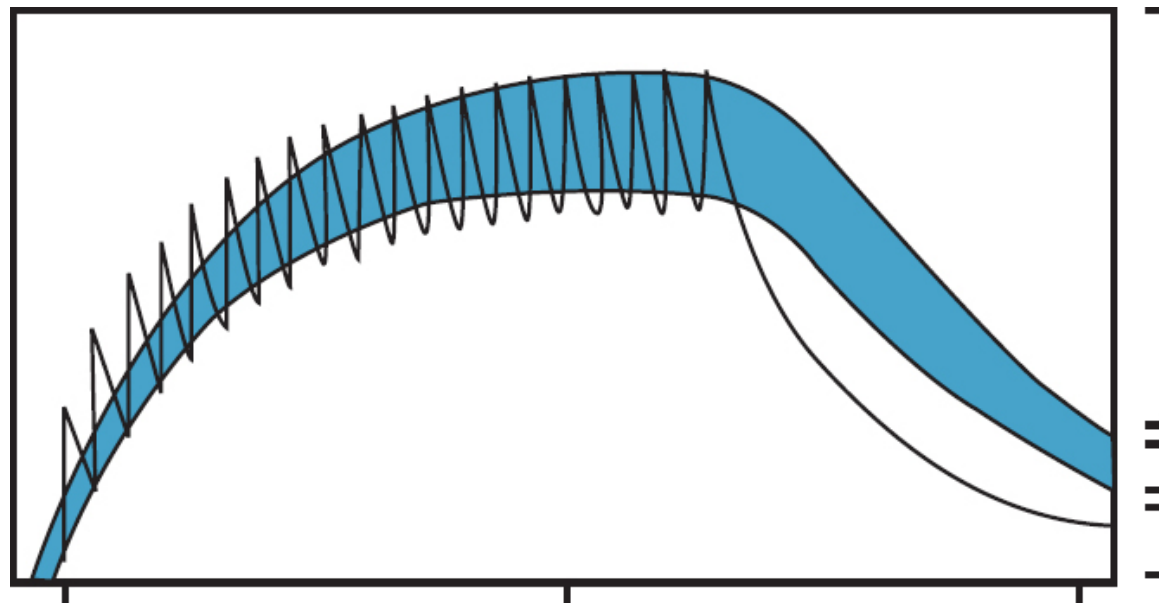


Pharmacokinetics

- Volume of distribution 180L
- Nicotine $T_{1/2}$ 2 hours
- First pass metabolism
- Accumulates during day and persists for 6-8 hrs after smoking ceases

Pharmacokinetics

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Pharmacokinetics

- Nicotine-----CYP2A6----->Cotinine
 - Lung, **liver** and brain
- Metabolism varies by race, gender
- 16 hr $T_{1/2}$ of cotinine
 - Marker for nicotine intake
- Cotinine blood levels avg 250-300ng/mL and persist 7 days after smoking

Pharmacologic Actions

- Nicotinic acetylcholine receptor agonist
- Stimulant effect in CNS
 - Enhances concentration, alertness, arousal
- Increase dopamine in brain

Primary Effect

- Arousal
- Relaxation (stressful situations)
- Enhancement:
 - Mood
 - Attention
 - Reaction time
- Chronic Use: relief of withdrawal

Reinforcing Effect

- Causes stimulation when fatigued
- Relaxation when anxious
- People therefore increase consumption at low and high arousal conditions

Tobacco Addiction

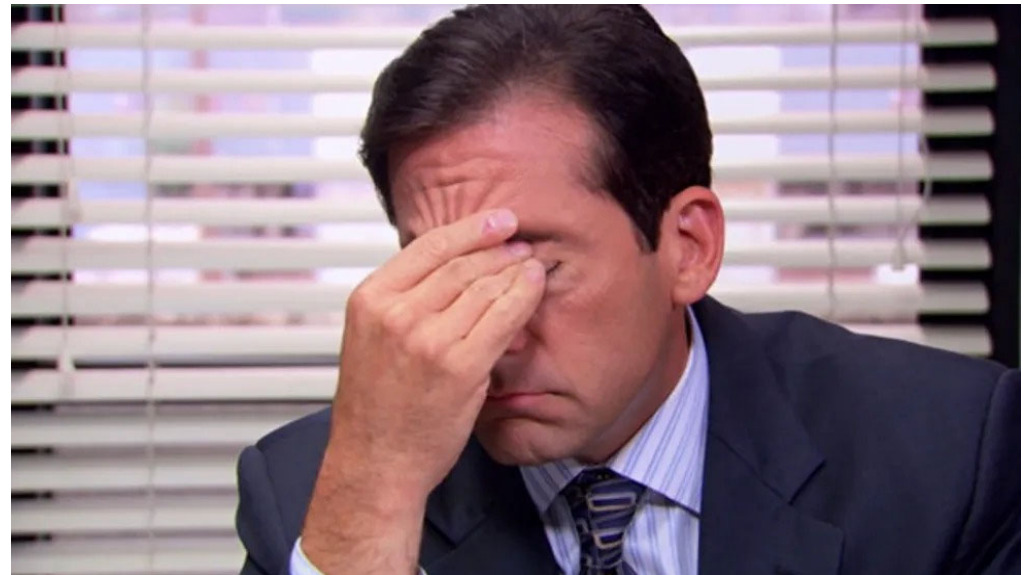
- Avg age first smoking 15
- Precedes other drug use
- Earlier begin, harder to quit
- Important Factors
 - Cigarettes per day
 - Time from waking to first cigarette
 - <30 min=moderate, <5 min=severe

Nicotine Withdrawal

- Neg. Reinforcement (avoid withdrawal)
- Distressing but not life threatening
- Reach max intensity 24-48 hrs after cessation and last for weeks
- Corticotropin releasing factor produces anxiety

Withdrawal Symptoms

- Depression
- Insomnia
- Irritability
- Anger
- Frustration
- Anxiety
- Poor concentration
- Restlessness
- Appetite/weight gain



Toxicity

- Tobacco Smoke:
 - Volatile= 500 compounds
 - nitrogen, CO, CO₂, ammonia, hydrogen cyanide, benzene
 - Particulates: >3,500
 - Anabasine, anatabine, myosmine
- Tar: numerous carcinogens

Pulmonary Toxicity

- Imbalance of preteolytic/antiproteolytic
- Increases airway responsiveness
- COPD
- DNA damage from aromatic hydrocarbons



Heart Toxicity

- Exposure of oxidant chemicals causing:
 - endothelial dysfunction
 - Platelet activation
 - Thrombosis
 - Coronary Vasoconstriction
- Reductions of oxygen delivery with CO

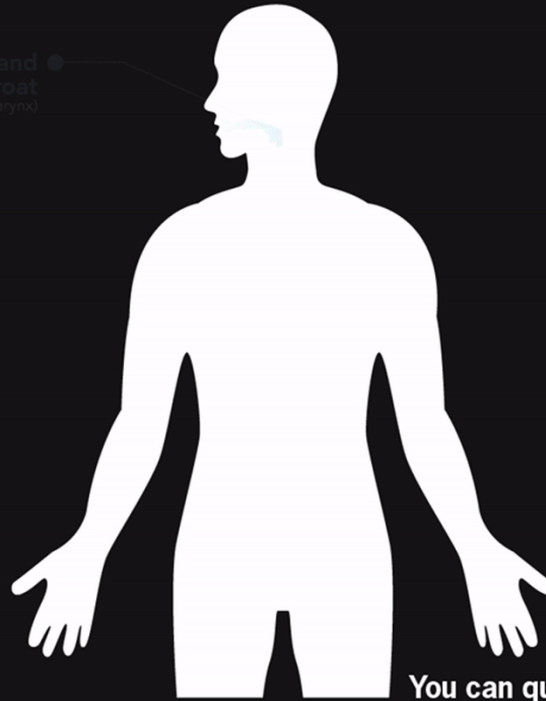
Other

- Early menopause
- Osteoporosis
- Yellow staining of fingers
- Aging skin



**Smoking can cause cancer almost
anywhere in your body.**

mouth and
throat
(oral cavity and pharynx)



You can quit.
For free help: 1-800-QUIT-NOW.



[CDC.gov/quit](https://www.cdc.gov/quit)

 **UK** HealthCare®

Health Consequences

- Coronary artery disease
- Stroke
- Cancer
- COPD
- Approx 10 years of life lost

Drug Interactions

- Speeds metabolism of many drugs
- Induces metabolism of:
 - Theophylline, propranolol
 - Flecainide, caffeine, olanzapine
 - Clozapine, imipramine, haloperidol, pentazocine estradiol
- Quitting will increase these levels

Drug Interactions

- Smoking (not nicotine) causes induction of CYP1A2
- Nicotine metabolized by CYP2A6

Other interactions

- Synergy w/ OCPs---> stroke, MI
- Nicotine inhibits reductions in BP and HR from β -blockers
- Less sedation from benzos
- Less analgesia from some opioids
- Less therapeutic effect of H2 blockers
- Vasoconstriction affects insulin absorp

Vaping Woes

- Highly addictive
- Harmful carcinogens
- Heavy metals: nickel, tin and lead
- Harm brain development
- Flavorings linked to serious lung disease

Cessation

- 75% of adults who smoke want to stop
- Only 1/3 try to stop
- <3% succeed unaided
- Poor utilization of treatment

Hospital Time=Quitting Time



Typical Treatment Scheme

- Is patient motivated to quit?
 - If not, motivate to quit
- Set a Quit Date
- Treatment planning
 - Pharmacotherapy
 - Counseling

Hospital Medicine Scheme

- Stuck in the hospital in stressful situation
- Reasons why opportune time
 - Removed from normal environs with cues
 - Acute illness may initially preclude smoking
 - Illness could be motivator
 - Daily contact with medical professionals

5As-if motivated to quit

- Ask
- Advise
- Assess
- Assist
- Arrange
- Quit Date-day of admission

Motivational Interviewing-5Rs

- Personal **Relevance** of quitting to patient
- **Risks** of Smoking
- **Rewards** of quitting
- **Roadblocks** to quitting
- **Repeat**

Treat Tobacco Dependence

- Nicotine Replacement Therapy
- Varenicline
- Bupropion

Nicotine Replacement

Gum

- 2- and 4-mg



Lozenges

- 2- and 4-mg



Patches

- 7 mg, 14 mg, 21 mg/24hrs



Other

- Inhaler
- Nasal Spray

Correct Dose Matters

Initial Dose of Nicotine Patch Based on Cigarettes Smoked Daily

Cigarettes per Day	Patch Dose (mg/d)
<10	7-14
10-20	14-21
21-40	21-42
>40	≥42

Doses of nicotine patches: 7, 14, and 21 mg.

Patch Dose Based on Blood Cotinine

Cotinine (ng/mL)	Nicotine Patch Dose (mg/d)
<200	14-21
200-300	21-42
>300	≥42

Doses of Nicotine patches: 7, 14, and 21 mg

NRT Pearls

- Don't Underdose
- Timing of dose
- Mix and match
- Don't forget to add lozenges/gum
- E-cigarettes hard to quantify dosage

Varenicline

- Blocks nicotine from binding to the receptor and stimulates receptor mediated activity
- Reduces cravings and withdrawal symptoms
- Start 1-5 weeks before quit date

Varenicline

- Dose
 - Days 1-3: 0.5 mg daily
 - Days 4-7: 0.5 mg BID
 - Day 8 and further: 1 mg BID
- Adverse Effects
 - Nausea
 - Vivid Dreams



Bupropion Sustained Release

- Norepinephrine and dopamine reuptake inhibitor
- Start 1 week before stop date at 150 mg/d for 3 days and then 150 mg twice daily
- Usual length of treatment 6-12 weeks

Bupropion Sustained Release

- Adverse Effects
 - Dry mouth
 - Insomnia
 - Lowers seizure threshold

Quick Tips

- Properly dose
- Long acting and short acting agent
- Don't forget to ask about other forms of tobacco

Add Behavioral Therapy

- Increases success by 10-20%
- Unaided 3-6%
- Cochrane Review: 1.83 relative risk with optimal therapy

Behavioral Therapy

Connect with your personal coach today. [Click to chat](#), call [1-800-368-1400 \(7:04-8:00\)](#), or [sign up today](#).

BE TOBACCO FREE
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Choose

[Get Started](#)

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1-800-Quit-Now


- 1-800-784-8669
- Perform Intake 45 minutes
- Develop Quit Plan/Date
- 5-7 coach calls (approx 1x per week)
- 2-12 weeks of NRT

QuitStart App

quitSTART

The quitSTART app is a free smartphone app that helps you quit

HOME TOOLS & TIPS QUIT SMOKING CHALLENGES WHEN QUITTING QUIT VAPING HELP OTHERS QUIT



The quitSTART app helps you:

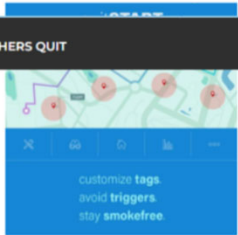
- Get ready to quit with tips and information to prepare you for becoming smokefree
- Monitor your progress and earn badges for smokefree milestones and other achievements
- Get back on track if you slip and smoke
- Manage cravings and bad moods in healthy ways
- Distract yourself from cravings with games and challenges
- Store helpful tips, inspirations, and challenges in your Quit Kit
- Share your progress and favorite tips through social media

Available for download on:

[Download from the Apple Store](#) [Download from Google Play](#)


The quitSTART app is a product of Smokefree.gov, a smoking cessation resource created by the Tobacco Control Research Branch at the National Cancer Institute in collaboration with the U.S. Food and Drug Administration and input from tobacco control professionals, smoking cessation experts, and [av-emn@cdc.gov](#)

Quit Notes



Drop a pin! Get tips when you're in the places that make you want to smoke. quitSTART can do that.

Stay distracted while you quit.



Quit tip: distract yourself through cravings. quitSTART comes with games that can help.

[Share](#) [Email](#)

Hospitalized Patients

- Cochrane Review in 2012
 - NRT 1.54 RR of cessation
 - Varenicline 1.28 RR
 - Bupropion 1.04 RR

Hospitalized Patients

- Smokers who received NRT, more likely to continue (42%)
 - Ever used NRT: ARR 5.64
 - Never used NRT: ARR 4.68

Billing

- Tobacco Counseling 3-10 mins (99406)
- Tobacco Counseling >10 mins (99407)

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