

The Kids Aren't All Right: Electronic Cigarettes & Kratom

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Working with communities to address the opioid crisis.

- ◆ SAMHSA's State Targeted Response Technical Assistance (STR-TA) grant created the *Opioid Response Network* to assist STR grantees, individuals and other organizations by providing the resources and technical assistance they need locally to address the opioid crisis .
- ◆ Technical assistance is available to support the evidence-based prevention, treatment, and recovery of opioid use disorders.

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Working with communities to address the opioid crisis.

- ◆ The Opioid Response Network (ORN) provides local, experienced consultants in prevention, treatment and recovery to communities and organizations to help address this opioid crisis.
- ◆ The ORN accepts requests for education and training.
- ◆ Each state/territory has a designated team, led by a regional Technology Transfer Specialist (TTS), who is an expert in implementing evidence-based practices.



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Contact the Opioid Response Network

✦ To ask questions or submit a technical assistance request:

- Visit www.OpioidResponseNetwork.org
- Email orn@aaap.org
- Call 401-270-5900



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The Kids Aren't All Right: Electronic Cigarettes & Kratom

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Objectives

- ✦ Electronic nicotine delivery systems
- ✦ Health effects of e-cigarettes
- ✦ Nicotine pharmacotherapy treatment
- ✦ Recognize clinical clues to intoxication with kratom, and ways to differentiate from other drug use
- ✦ Discuss treatment of medical and psychiatric complications resulting from use of kratom



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Electronic cigarettes

- ❖ Neither designed nor marketed for smoking cessation
- ❖ Intentionally attractive to youth with flavorings (bubblegum, etc.)
- ❖ Introduced in U.S. in 2006, only recently became regulated in U.S.
- ❖ Less harmful than tobacco, but more dangerous than air

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First Generation E-cig
 Low single Voltage
 Prefilled Cartridges
 Sold by major Tobacco Companies
 Have been tested in Clinical Trials

Second Generation E-cig
 Adjustable Voltage
 Refillable Cartridges
 Not sold by major Tobacco Companies
 Not been tested in Clinical Trials
 Recommended as superior to 1st Gen Ecigs

Third Generation E-cig
 Adjustable Voltage and Wattage
 Refillable Cartridges
 Programmable via Connection to Personal Computer
 Not sold by major Tobacco Companies
 Not been tested in Clinical Trials
 Recommended as far superior to 1st Gen Ecigs

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Juul pods

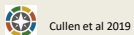
- ❖ “pod mod” e-cigs introduced in 2015
 - 1 pod = 20 tobacco cigarettes (1 pack)
- ❖ Used discreetly in places where smoking is forbidden
 - School bathrooms
 - Looks like a flash drive
 - Charges in USB port
- ❖ Age 15-19 more likely to use Juul than adults

Vallone et al 2020

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E-Cigarettes in teens

- ✦ Teens more likely to use e-cig than cigarettes
- ✦ e-cig use in youth
 - 27.5% of high school students
 - 10.5% of middle school students
- ✦ Provide sweet & fruity flavors
- ✦ Tobacco & weight
 - Girls concerned about their weight start smoking/vaping at higher rates than boys



Cullen et al 2019

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E-liquids

- ✦ Different nicotine concentrations
 - May be very high
 - Handle with caution
- ✦ Humectants
 - Propylene glycol
 - Vegetable glycerin
- ✦ Some chemicals may be flammable
- ✦ Contains impurities
 - Up to 5x the max allowed levels



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Dripping e-juice

- ✦ Apply directly from bottle onto heating element & inhale vapor
- ✦ Use “drip tip” on bottle or eyedropper
- ✦ Larger nicotine dose
- ✦ More by-products, including formaldehyde



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Vaping Cannabis

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Health effects

- ❖ Heart disease
 - Accelerates atherosclerosis
- ❖ Chronic obstructive pulmonary disease
- ❖ Lung cancer
- ❖ Head & neck cancer
- ❖ Bladder cancer

Side effects of nicotine

Circulation

- Increased clotting tendency
- Atherosclerosis
- Enlargement of the aorta

Lungs

- Bronchospasm

Muscular

- Tremor
- Pain

Hormonal

- High insulin
- Insulin resistance

Joint pain

Gastro-intestinal

- Nausea
- Dry mouth
- Dyspepsia
- Diarrhea
- Heartburn
- Peptic Ulcer
- Metastasis

- Central
- Lightheadedness
- Headache
- Sleep disturbances
- Abnormal dreams
- Irritability
- Dizziness
- Risk of blood restriction
- Heart
- Increased or decreased heart rate
- Increased blood pressure
- Tachycardia
- More (or less) arrhythmias
- Coronary artery constriction
- Coronary artery disease
- During pregnancy, risks to child later in life
- Type 2 diabetes
- Obesity
- Hypertension
- Neurobehavioral defects
- Respiratory dysfunction
- Infertility

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Why is it so hard to quit?

- ❖ Nicotine is as addicting as heroin, cocaine, or alcohol
- ❖ Stimulation of nicotine receptors in the brain & activation of the dopamine reward system mediate the pleasurable effects and positive reinforcement

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Why is it so hard to quit?



- ❖ The behaviors using e-cigarettes become entrenched in daily routine
- ❖ Nicotine has become important in modulation of mood, appetite, energy metabolism, and ability to deal with stress & boredom



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Nicotine Withdrawal

- ❖ craving for tobacco
- ❖ irritability, frustration, anger
- ❖ anxiety
- ❖ difficulty concentrating
- ❖ restlessness
- ❖ decreased heart rate
- ❖ increased appetite or weight gain
- ❖ depression
- ❖ disrupted sleep
- ❖ sedation



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Nicotine Withdrawal



- ❖ Begins within 24 hours of last use
- ❖ Lasts 2 - 4 weeks
- ❖ Tobacco craving & increased hunger may last for 6 months or more



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Environmental prevention

- ◇ Legal age limits on buying tobacco products
- ◇ Recent restrictions of e-cigarette flavorings
- ◇ Smoking/vaping bans
 - Restaurants
 - Airplanes



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Nicotine replacement therapy

- ◇ Always combine with a behavioral therapy program
- ◇ Most available OTC
- ◇ Reduces harmful effects of tobacco smoking/vaping
- ◇ Patients should not smoke/vape while using



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Nicotine Patch

- ◇ Highest success rate of available nicotine replacement pharmacotherapies
- ◇ Nicoderm, Nicotrol, Habitrol, Prostep
- ◇ Most come in 3 strengths: 21, 14, & 7mg
- ◇ Start with 21mg patch for 6 wks, taper to 14 mg for 2-4 wks, finally 7 mg for 2-4 weeks
- ◇ Use new patch in different spot on upper trunk every 24 hrs



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Nicotine Gum

- ❖ Nicorette - 2 or 4mg per piece doses
- ❖ Requires correct “chewing technique” -- don’t chew like regular chewing gum
- ❖ Chew 1 piece for 30 minutes every 1 to 2 hours to prevent nicotine withdrawal
- ❖ Chew regularly for first month, then taper off over 6 months



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Bupropion (Zyban)

- ❖ Bupropion 150mg sustained release pills
- ❖ Works on dopamine & norepinephrine receptors in the brain to decrease withdrawal
- ❖ May cause insomnia, anxiety, or seizures
- ❖ Prescription includes behavioral program
- ❖ Start pills 10-14 days before “quit date”
- ❖ Take daily for 3 days, then twice a day
- ❖ Continue pills for 8 - 12 weeks



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Varenicline (Chantix)

- ❖ Nicotine partial agonist
- ❖ Start pills 10 days before quit date
 - Increase dose
 - Take for 12-24 weeks
- ❖ Includes behavioral program
 - GetQuit.com



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Efficacy of tobacco cessation products

- ◇ There have been many studies and several meta-analyses of all products
- ◇ Nicotine replacement therapy quit rates are similar with different products
 - Doubles chance of successful quitting
- ◇ Varenicline
 - Higher rate of continuous tobacco abstinence compared to bupropion & nicotine patch
- ◇ Bupropion
 - Quit rates are comparable to nicotine patch



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Combination therapy

- ◇ Combinations are more effective than a single product at a time
- ◇ Patch + gum/lozenge
- ◇ Bupropion + NRT
- ◇ Varenicline + NRT
 - Superior to either alone
 - Can start both together
 - Patch faster for withdrawal symptoms
- ◇ Varenicline + bupropion
 - Do not interact
 - Good for heavy users



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What patients can expect when quitting



- ◇ Nicotine withdrawal symptoms
- ◇ Temporary increase in cough
- ◇ Weight gain
- ◇ Pressure from others (esp. if family or in same household)



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Behavioral treatment

- ❖ Environment
 - Use up all tobacco products
 - Remove e-cigarettes
- ❖ Distraction
 - For nicotine cravings
 - Glass of water
 - Other activities
- ❖ Lollipop, gum, hard candy (sugar-free)

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www.smokefree.gov

- ❖ Free, public resource
- ❖ Sign up for helpful text messages, e-mails
- ❖ Download app
- ❖ Help to design an individual quit plan
- ❖ Info about pharmacotherapy
- ❖ Sponsored by
 - U.S. Department of Health and Human Services
 - National Institutes of Health

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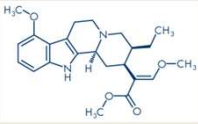
What is kratom?

- ❖ Derivative of *Mitragyna speciosa* (kratom) tropical tree
 - Native to Indonesia, Malaysia, and Thailand
- ❖ Leaves used medicinally in Southeast Asia
 - Stimulatory effects (similar to caffeine) at low doses (1-5 grams)
 - Analgesic and sedative effects at higher doses (6-15 grams)

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Pharmacology

- ◇ Main psychoactive compound: **mitragynine**
 - 40 structurally similar alkaloids, including 7-Hydroxymitragynine (7-OHM)
 - Agonists at multiple opioid receptors: mu, kappa, delta
 - 26% lower intensity than morphine (partial agonist)
 - Not as strong a euphoric high compared to most opioids
 - Much less likely to cause fatal respiratory depression

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Kratom Availability

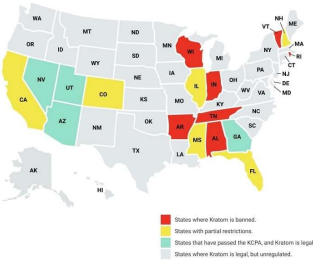
- ◇ Widely available in the USA
 - Regulated as a dietary supplement by the FDA
 - Not considered a controlled substance by the DEA
 - Federally listed as a “drug of concern”
 - Several states have listed as a controlled substance
- ◇ Patchwork of state and local bans ineffective at restricting access
 - Vendors do not abide by bans
- ◇ Illegal in Southeast Asia and Malaysia



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Kratom in the USA

Kratom Legality By State 2021



- ◇ First reports of importation into U.S. in the 1980s
- ◇ Marketed as “natural high” or opioid substitute
- ◇ Sold on the Internet
 - >600 vendors sell to US
- ◇ Price of 99 cents per gram
- ◇ Easy access to wide variety of unregulated and untested products

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Ways Kratom Is Used

- ◇ Consumed as
 - Chew leaves
 - Tea (brewed from leaves)
 - Powder made of dried leaves
 - Powder in capsules
 - Mix into food
 - Gum or extract
 - Put into 'gummies'
 - Newer extracts more potent
 - Smoke leaves





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Who Uses Kratom

- ◇ Lifetime prevalence of 6% in nationally representative sample of US adults in 2020
- ◇ Mostly male, age 25-44
- ◇ Kratom users twice as likely to also use nicotine and cannabis
 - Higher use of illicit drugs
- ◇ 43% use to bypass drug test
 - Previous incarceration
 - Previous SUD treatment




Covvey et al 2020 35



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Adverse effects

- ◇ Agitation
- ◇ Altered mental status (confusion)
- ◇ Tachycardia (rapid heart rate) or abnormal heart rhythms
- ◇ Sedation, coma
- ◇ Tolerance
- ◇ Withdrawal syndrome
- ◇ Liver damage
- ◇ Seizures
- ◇ Death
 - May also be from other compounds combined with kratom






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Kratom withdrawal





- ❖ Similar to opioid withdrawal
- ❖ Mostly subjective symptoms
 - Chills
 - Nausea/vomiting/diarrhea
 - Myalgia
 - Rhinorrhea
 - Anxiety and restlessness
- ❖ May persist longer than typical opioid withdrawal (up to 3 months)



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Treatment of Withdrawal

- ❖ Buprenorphine/naloxone used most often
- ❖ Mitragnine is partial mu opioid agonist like buprenorphine
- ❖ Abstain from kratom for 24 hours prior to induction
- ❖ Monitor with a scale to measure opioid withdrawal severity
- ❖ Maintenance doses of 16-24 mg daily in divided doses (3-4 times per day)
- ❖ Similar to dosing for other opioids

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Treatment of Addiction




- ❖ Behavioral counseling
 - Individual
 - Facilitated groups
- ❖ Mutual-help groups
 - 12-Step (Narcotics Anonymous)
 - SMART Recovery
- ❖ Family therapy



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Summary

- ❖ Electronic cigarettes are very popular among teenagers
- ❖ E-cigarettes are not designed as a method to help quit using combustible tobacco cigarettes
- ❖ Nicotine replacement therapy (patch, gum) are available without a prescription and are effective to help quit using electronic cigarettes
- ❖ It is important to talk with teens about use of e-cigarettes and help is available to quit



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Summary

- ❖ Kratom comes from Southeast Asia tropical tree leaves and is consumed as tea or powder capsules
- ❖ Kratom is not illegal in the U.S., but has psychoactive effects and side effects
- ❖ Kratom has opioid-like effects, including a withdrawal syndrome (like the flu)
- ❖ Kratom withdrawal and addiction can be treated with prescription medication (buprenorphine)



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Questions?



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