Love Being Back
The 41st Annual MidWinter Convention & Expo

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Synopsis:
There is hardly a day that goes by without 'vaping' making headline news. We are just beginning to learn about the potential long-term risks of vaping. Vaping-related pulmonary illness, alteration of adolescent brain development, nicotine addiction, accidental injuries and several reported deaths are a few of the risks that are becoming known with the use of vaping products. What is our messaging to our dental patients and how may we best educate them on the potential risks of this growing trend?

Learning Outcomes:
Identify vaping incidence and prevalence in the U.S.
Discuss the science behind vaping which has led to its growing popularity and addictive properties
Recognize the impact of vaping on oral and systemic health
Understand the role of the dental professional in educating the public about vaping

References:
All sites accessed December 2021
NIH Funded Monitoring the Future Survey - http://monitoringthefuture.org/
https://www.singlecare.com/blog/news/vaping-statistics/#us-vaping-stats
U.S. E-cigarette & Vape Market Size, Share & Trends Analysis Report By Product (Disposable, Rechargeable), By Component (E-liquid, Vape Mod), By Distribution Channel, And Segment Forecasts, 2021 – 2028. Published date January 2021.

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VAPING: *JUST THE FACTS!*

Vaping Defined:

in·sid·i·ous

/inˈsidēəs/

a. having a gradual and cumulative effect: SUBTLE
b. of a disease: developing so gradually as to be well established before becoming apparent : ADDICTIVE
c. awaiting a chance to entrap : TREACHEROUS
d. harmful but enticing: SEDUCTIVE

Vaping Incidence and Prevalence in the U.S.

Cigarette Smoking vs. Vaping Use
Tobacco remains the leading preventable cause of death in the U.S.
Cigarette smoking accounts for 30% of all cancer deaths
Prevalence of cigarette smoking has declined among US adults ages 18 and older from 42% in 1965 to 14% in 2018; greatest decline among young adults 18 – 24 years of age Conversely, largest increase in vaping from 2014-2018 was among adults ages 18-29 who had never smoked cigarettes; grown in usage by 600 percent in the U.S. over the past decade and are expected to continue to gain users over the coming years.

Vaping Statistics in the U.S.
Roughly 1 in every 20 Americans use vaping devices, and 1 in 3 users vape daily. Annals of Internal Medicine, 2018
Washington, D.C. has the lowest rate of e-cigarette usage, followed by South Dakota, California, Maryland, and Vermont. CDC, 2017
20% of Americans ages 18 to 29 use vape products, compared with 16% of those ages 30 to 64, and fewer than 0.5% among those 65 and older. Gallup, 2018
Youth e-cigarette use rose 1,800% from 2011 to 2019. Truth Initiative, 2019
Two-thirds of young JUUL users (ages 15 to 21) don't know that the product always contains nicotine. Truth Initiative, 2019
More than 30% of teens who start using e-cigarettes begin smoking traditional tobacco products within six months. (National Institute on Drug Abuse, 2016)
Only 15% of U.S. e-cigarette users are non-smokers. (Annals of Internal Medicine, 2018)

Vaping Industry is…*BIG Business!*
High popularity among youth and rapid increase of vape shops across country
U.S. vape market size was valued at 7.43B in 2021 with an expectation of compound annual growth rate of 27% from 2021 to 2028 to 40.25B

Notes:

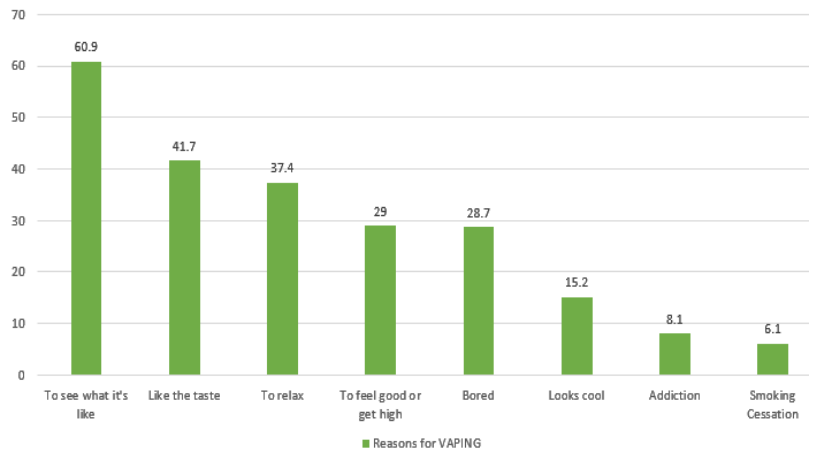
Delivery of same addictive nicotine marketed to provide a 'safer' alternative to smoking or gateway to quitting.

The Science Behind the Addiction and Growing Popularity

According to study sponsored by the National Institute on Drug Abuse, the increase in vaping was the largest ever recorded for any substance
Higher doses of nicotine, compact and discreet devices have all played a part in this growth trajectory
Maximum amount of nicotine content allowed in e-cigarettes is currently 66 mg/ml; average cigarette contains about 10 – 12 mg. of nicotine with an average intake of 1.1 to 1.8 mg.
The average JUUL pod contains approximately the same amount of nicotine as a pack of cigarettes.
FDA has not approved e-cigarettes as a smoking cessation aid

Is Vaping Cessation Like Smoking Cessation?
Youth are now reaching out for help to quit vaping
Practitioners have only a smoking cessation model at this time
Similarities emerged between both groups studied which included;
Barriers to quitting were social benefits, stress reduction, sensory and behavioural gratification
Reasons for quitting were financial loss, industry influence, and dependence
However, differences emerged as well, which included;
Barriers to quitting vaping were enjoyment of flavours, convenience and discreetness, lack of self-awareness of vaping behaviours
Reasons for quitting were lack of trusted information and perceived social acceptability

Reasons for Vaping Have Changed
Over the years, the 'average vape user' is not a 25-45 y.o. looking for a smoking cessation product.
It is a 15-19 y.o. JUULing with friends.
This is the concern…



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NIH Monitoring the Future Survey - http://monitoringthefuture.org/

Notes:

KEY Talking Points

Number of current youth e-cigarette users remains concerningly high
High addiction rates to nicotine among daily youth vapers
Pre-filled pods/cartridges most commonly used device type in 2020, however disposable e-cigarette use surged 1000%
>80% of youth are using flavored e-cigarettes with most common being fruit, mint, candy, desserts or other sweet flavors

Youth Attraction to Flavors…*BIG Business!*

Presently in the U.S. there are 400 brands and over 7,000 flavors
"We really don't know anything about their effects on health — if they have an impact on health or if they are completely safe to use." Dr. Purnima Kumar, Ohio State University, Lead Researcher

California State Flavor Ban Status

The California Assembly passed (and the governor signed) a law banning all "flavored tobacco," including vapes, in August 2020. However, after a massive signature-gathering campaign, the law is on hold until the state's voters decide whether to approve it in a November 2022 referendum. The law, if it passes, will prohibit all vapes in flavors other than tobacco

Age Verification Issues, Challenges and Solutions

The challenge the vape businesses face presently is ambiguity in regulatory 'law'
Agreement that age must be verified prior to purchase
Laws set forth by VPPR (Vaping Products Promotion Regulations) is more easily applied and intended for brick and mortar shops; not as realistic for online retailers to 'hide' their product; end result you finding websites that will ship for free from China

The Impact of Vaping on Oral and Systemic Health

Efficacy and Safety of E-Cigarette Use

A study based to examine efficacy and safety of e-cigarette use drew the following conclusions;
E-cigarettes achieved modest cessation rates
Participants continued to use e-cigarettes to maintain their habit instead of quitting
22 toxic substances in addition to nicotine were reported in the liquid of e-cigarette cartridges and its emissions
A wide variation of nicotine concentration existed in e-cigarette cartridges
There is a strong need to conduct large, long-term global clinical trials to further understand both the efficacy and safety of e-cigarettes.

The Cloud is Aerosol, not Water Vapor

Some of the chemicals include propylene glycol, acetone, ethybenzene, formaldehyde and rubidium.

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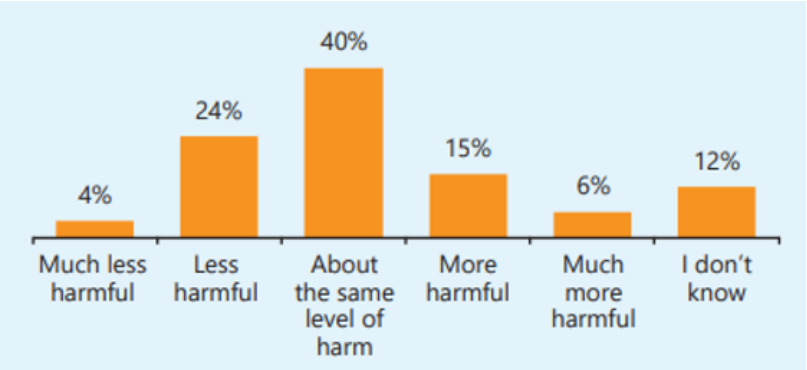
Perceived Harm of Vaping vs. Cigarettes



The Very Real Concern:

"I, Surgeon General of the United States Public Health Service, am emphasizing the importance of protecting our children from a lifetime of nicotine addiction and associated health risks by immediately addressing the epidemic of youth e-cigarette use. The recent surge in e-cigarette use among youth, which has been fueled by new types of e-cigarettes that have recently entered the market, is a cause for great concern. We must take action now to protect the health of our nation's young people."
U.S. Surgeon General Jerome Adams Report, 2018

"The high rate of youth vaping is of fundamental concern and provides the necessary rationale for the new regulations. High nicotine levels have contributed to a new generation of young people becoming addicted to nicotine through e-cigarettes."
Senior Policy Analyst, Canadian Cancer Society

Current Statistics:
As of February 18, 2020, a total of 2,807 hospitalized EVALI cases or deaths have been reported to CDC from all 50 states, the District of Columbia, and two U.S. territories (Puerto Rico and U.S. Virgin Islands).
Sixty-eight deaths have been confirmed in 29 states and the District of Columbia (as of February 18, 2020).

Effect of Vaping on Systemic Health:
The addictive properties of nicotine are well known and the adverse effects on systemic health well researched
Nicotine demonstrated to likely be the main cause of altering brain activity elevating mood, and markedly reducing activity in prefrontal cortex affecting cognitive behaviour and decision-making
Adverse effects of nicotine on systemic health beyond the brain; affects insulin resistance and predisposes individuals to metabolic syndrome
Addition of benzoic acid to nicotine salts inhaled into the lungs is causing respiratory tract irritation

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Additional Health Risks Associated with Vaping

Explosions and burn injuries have been reported due to malfunction of lithium batteries

Unintentional poisoning of children due to consumption of flavour pods and liquids;

More than half (51%) of the calls to poison centers due to e-cigarettes involved young children under age 5

An estimated 4745 cases of poisoning injuries presented to EDs in the US.

Second-hand vapour health effects are still unknown

"Vaping is such a big assault on the oral environment, and the change happens dramatically and over a short period of time."

Purnima Kumar, Professor of Periodontology at the Ohio State University and senior author of the study.

Effect of Vaping on Oral Health:

Impact of high concentrations of nicotine vapour on the oral mucosa are unknown

Nicotine is known to cause xerostomia increasing the risk for caries and periodontal disease progression

Long-term effects of propylene glycol on the oral cavity are unknown

Viscous property of e-liquid provides adherence for Streptococcus mutans and increased biofilm formation

The role of vaping in initiation of oral cancer is inconclusive

Systematic Review: Effect of E-Cigarettes on the Oral Cavity

Summary of Findings

Periodontal clinical and radiographic parameters, proinflammatory cytokine levels higher among electronic and conventional cigarette smokers than non-smokers

Bleeding on probing was higher in non-smokers

Nicotine stomatitis, hairy tongue, and angular cheilitis in e-cigarette consumers

Results suggest e-cigarettes are less harmful than conventional cigarettes however demonstrate greater susceptibility to developing alterations in oral biological tissues than ex-smokers or non-smokers

The Impact of Nicotine on the Periodontium:

Over 50% of periodontitis cases in the U.S. are impacted by tobacco smoking; a modifiable risk factor

A direct, causal relationship has been determined between smoking exposure and prevalence/severity of periodontal disease

Contributing mechanisms amongst smokers include vasoconstriction, oxygen gradients, altered immune response, increased number and virulence of periodontal pathogens, altered fibroblast attachment/function, collagen degradation, upregulation of pro-inflammatory markers and decreased efficacy of mechanical and surgical therapies.

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Resources:

1. Medical History Update Form – handout included
2. Quit Vaping App
3. Florence, WHO's first AI health worker to develop a personalized plan to quit smoking/tobacco use. https://www.who.int/news-room/spotlight/ai-for-quitting-tobacco-initiative
4. Stanford Medicine Vaping Information, Solutions, and Interventions Toolkit https://med.stanford.edu/visit.html
5. Interactive Vaping Toolkit https://www.scholastic.com/youthvapingrisks/interactive/index.html

Breakout Session:
Identify 2 KEY messages and a dialogue starter for one of the following scenarios;
Scenario 1
My patient is a youth, non-smoker and recently started vaping.
Scenario 2
"I don't smoke, I vape. It's a lot less harmful."
Scenario 3
My patient is planning on vaping to quit smoking.

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The Impact of Vaping on the Periodontium:
Similarly, vaping involves the inhalation of nicotine with the initial point of contact being the oral cavity
Despite lack of robust scientific data specific to vaping, the biologic effects of nicotine on oral tissues is well established
Expressed concerns;
Quantity of nicotine varies considerably; one pod may be equivalent to a pack of cigarettes
Users can consume higher amount of nicotine in vape liquid
Independent of inhalation depth, 45% of released nicotine deposited in oral cavity
Nicotine suspended in propylene glycol which release other known carcinogens when heated

The Role of the Dental Professional in Vaping Education

What Can We Do as Dental Professionals?
Inquire about vaping history with patients
Stay up-to-date on the latest evidence
Provide education, discuss known/unknown risks related to long-term use of vaping
Warn youth in particular about unknown dangers and pregnant women should be advised not to vape
Recognize symptoms of vaping related respiratory illness such as cough, shortness of breath, chest pain, fever and GI upset.

Initiating the Vaping Discussion and Intervention:
Communicate fact, not emotion
Long term health outcomes unknown
Addictive; not recommended for non-smokers
Not recommended for youth; impact on developing brain is of great concern
Not recognized as a smoking cessation aid
Be respectful and empathetic to where client is in change process
Listen carefully and identify possible discrepancies between behaviours and perceived patient goals
Support and encourage the patient's belief in the possibility of change

In conclusion: Dental professionals play a significant and authoritative role in this present-day healthcare issue. Educating our patients on the dangers, consequences and also the void that exists regarding long term study of vaping effects, is an opportunity for us to positively impact the health of Americans.

If I may assist you with any further information regarding today's presentation, please don't hesitate to contact me at jjones@jo-annejones.com

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