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Increasing Awareness of Health Risks Associated with Vaping in Youths

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Problem Identification

- ▶ According to CDC statistics in 2014 an estimated 2.4 million middle and high school students used electronic cigarettes in the last 30 days.
- ▶ In the 2017 Monitoring the Future survey, more teens had used e-cigarettes in the past 30 days than any other tobacco product, including traditional cigarettes.
- ▶ 2018 Monitoring the Future survey showed levels of perceived risk for vaping ranking near the lowest of all substances, with little change in recent years.
- ▶ In a 2018 Morbidity and Mortality Weekly Report, an estimated 78% of teens had been exposed to e-cigarette advertisement, including retail stores, internet, movie, TV, newspaper and magazine ads.
- ▶ The 2017 Vermont Youth Risk Behavior Survey has found that a third of students (34%) have tried an electronic vapor product in their lifetime.
- ▶ 2017 Vermont Youth Risk Behavior Survey for Washington County showed 12% students having used electronic vapor products within the last 30 days, and 28% of these current users vaping on over 10+ days within the last 30 days.
- ▶ Among current e-cigarette users in the 2017 Vermont Youth Risk Behavior Survey, 17% cited the availability of flavors as a reason to use, while 35% cited having family/friends who use as a reason.
- ▶ Increasing evidence that vaping predicts future cigarette use or experimentation. More preventative health measures are needed to curtail this growing drug epidemic.

Public Health Cost

- ▶ Electronic nicotine delivery systems (ENDS) use is a relatively new phenomena and studies about the long-term effects of chronic vapor product inhalation are still underway. However increasing trends of youth use of e-cigarettes/vaping and general lack of knowledge among teens and young adults about potential health impacts is a growing concern.
- ▶ In the 2017 Vermont Youth Risk Behavior Survey only 5% of current e-cigarette users stated they were using vaping to quit other tobacco products, while 8% of current users stated they were vaping because they believed it to be less harmful than other tobacco products.
- ▶ Some recent studies in 2017 and 2019 have found associations with e-cigarette use and future MI and chronic bronchitis.
- ▶ A recent study on 17,389 adolescents and young adults, ages ranging between 14 and 30 years, showed an association between initial use of e-cigarettes and subsequent cigarette smoking. Youth e-cigarette smokers had a 3.5 odds ratio for initiation of cigarette smoking compared to non e-cigarette smokers.
- ▶ According to the National Institute of Health 2018 *Monitoring the Future Survey* traditional cigarette use has fallen by 91% since the mid 1990's among 8th, 10th and 12th graders. This has been a great success for preventative health measures.
- ▶ However nicotine vaping in 2018 was found to have increased by 3.4% in 8th graders, 8.9% in 10th graders, and 10.9% in 12th graders.
- ▶ The 10th and 12th grade increases are the largest ever recorded for any substance in the 44 years that the *Monitoring the Future Survey* has tracked youth drug use.
- ▶ The e-cigarette industry worth in 2018 was 10 billion dollars, and e-cigarette companies increased advertisement spending from \$6.4 million in 2011, to \$115 million in 2014. Even looking in recent news the FDA and FTC reprimanded 4 e-cigarette companies for violating tobacco federal advertising rules by failing to include warnings that e-cigarettes contain nicotine on advertisements marketed to Instagram, Facebook and Twitter in June 2019. With marketing of flavorings like peach and bubblegum, the youth demographic is a prime marketing target for new users of these devices.

Community Perspective # 1

- ▶ Michael McRaith, Principal Montpelier High School
 - ▶ Has noticed a large increase in vapor product use within the last few years and especially within the last year and half.
 - ▶ Notes vaping has become a trendy “cool” activity, particularly through students social media (posting themselves vaping on snapchat). This has become a viral way in which tobacco companies can get there products advertised among youth.
 - ▶ Current laws limit sales to those 18 or over in Vermont. Some students over 18 see this as a lower “risk” enterprise to make money and are reselling vaping devices and pods to younger students for profit. Students may also be getting it through the internet.
 - ▶ Education of students is somewhat limited with only one assembly on the topic for 9th graders as part of the students health curriculum.
- ▶ Elizabeth Bailey, RN, NCSN Montpelier High School
 - ▶ The JUUL devices are the most popular devices in use in school. It looks like a USB device and is easy to conceal.
 - ▶ Students are not appreciating how addictive vaping is and how it can effect developing brains.
 - ▶ Growing evidence to suggest that many individuals who vape eventually go on to experiment with traditional cigarette use.

Community Perspective #2

- ▶ Elizabeth Bailey, RN, NCSN Montpelier High School Cont.
 - ▶ Fear that students perceive it as a smoking cessation treatment and therefore assume it should be much healthier than traditional tobacco products.
 - ▶ With ubiquitous advertisements and peer pressures involved students would benefit from consistent repetition of the dangers of vaping from many trusted adult sources - teachers, parents, counselors and medical professionals.
- ▶ Jennifer Wall-Howard, Assistant Principal Montpelier High School
 - ▶ Notes vaping is more prevalent among 10th and 11th graders, who are using this as a shared social activity, texting and gathering in groups in the bathroom or hidden areas.
 - ▶ Difficult to catch students in the act, as vapor devices are small, easy to conceal or not easy to identify as a variety of devices look similar to pens/USB devices/etc.
 - ▶ Vapor “smoke” is almost odorless leaving very little trace behind in clothes or vaping areas making them more attractive to students.
 - ▶ School is currently working toward interventional rather than purely punitive actions toward student offenses related to e-cigarette use, including offering addiction counseling to students who are caught.
 - ▶ Students have a lot of exposure to various forms of media and are very “politically savvy” about the messages they are being fed. Providing factual information about what the tobacco industry is investing into and what they stand to gain from e-cigarettes could be another way to jumpstart critical thinking in youths considering using.

Intervention and Methodology

- ▶ The aim of this community health project was to provide primary health care providers at UVMMC Berlin Family Medicine with information on the growing vaping, e-cigarette problem among high school youths.
- ▶ Provide educational sources to discuss health concerns related to e-cigarettes with youth patients and their parents.
- ▶ Interviews were made with staff at Montpelier High School about the educational health curriculum on e-cigarette use and health risks available to students in the community, as well as barriers to effective communication to this age group.
- ▶ Development of a fact sheet with information from multiple validated sources was created as a handout and educational aid for preventative interventions on e-cigarette use in youths.

Results

- The developed fact sheet was provided to select teen high school patients at UVMMC Berlin Family Medicine during their office visits and qualitative evaluations were given:
 - Patients gave generally positive reviews, noting that it was informative and it helped clarify some of the things they wanted to know about vaping. Patients stated that they did not have any difficulty understanding or reading the fact sheet.
 - One patient stated that they liked that the fact sheet had all the major questions listed and answered each question with specific details and statistics.
 - Another patient stated that they were surprised how many students were effected by vaping and liked having the statistics about how fast the number of users was growing in high schoolers.
- Staff members of UVMMC Berlin Family Medicine were invited to read the fact sheet and give qualitative feedback.
 - Faculty were very open to having the fact sheet as an intervention aid, and stated that it used appropriate language and had a lot of important points.
 - One point of possible improvement was that a lot of information was included which could be either helpful or detrimental. Some patients may be put off from reading it because of how much was included, but those who were interested in the topic and would get a lot out of it.
 - Another point was that the language may be difficult for younger age groups, and may limit the target audience to English populations with middle school education and above.

Learn the Facts About Vaping



What is vaping?
Vaping is the use of a portable battery powered device to heat cartridges of liquid solutions (or "e-liquids") containing nicotine, flavorings, and other chemical additives into an aerosol cloud that can be inhaled into the lungs.

Aerosol from e-cigarettes can contain chemical particles from both the liquid solution and the device itself (such as particles from heated device components).

These devices go by a variety of names and are commonly known as electronic cigarettes or e-cigarettes, hookah pens, e-pipes, JUUL[®], or vape pens.

What do these devices look like?
They come in a variety of forms and can range from looking like cigarettes, pens to USB's.

Isn't vaping and e-cigarette use a safe alternative to traditional cigarettes?
No. E-cigarette use is relatively new and studies about the long term effects of chronic vapor inhalation are still underway.

E-liquids can vary widely in levels of toxic and carcinogenic compounds depending on device and manufacturer.

Additives and flavorings can cause chemical reactions in e-liquids, changing the chemical composition and creating new toxins or irritants that can be inhaled.

While commonly advertised and used as an aid to quit smoking, vaping and e-cigarettes are not FDA approved for smoking cessation.

Do e-cigarettes and other vapor device products contain Nicotine?
Yes. Many e-liquids contain nicotine and can vary widely in chemical composition and amount of nicotine available.

All JUUL pods contain nicotine. JUUL does not make nicotine-free pods.

What is in vaping e-liquids then?
The most common ingredients are **nicotine**, **propylene glycol**, and **vegetable glycerin**. Solutions also include many additives and flavorings with unknown health effects.

One known product of vaping is **formaldehyde gas**, which can increase the risk of certain cancers or worsen asthma and other respiratory illnesses.

What does nicotine do?
Nicotine is an addictive substance derived from tobacco plants and is used as a stimulant, activating reward pathways in the brain.

Effects of nicotine include increased heart rate, blood pressure, changes in memory, concentration, and appetite suppression.

Mild intoxication can lead to headache, nausea, vomiting, tremors, and stomach upset.

Severe nicotine poisoning can cause irregular heartbeat, chest pain, seizures, ultimately leading to paralysis, difficulty breathing, loss of consciousness and death.

What is the harm that vaping can do?
Brains continue developing until the early 20's. Early exposure to nicotine and other compounds found in vaping devices can change the chemistry of the brain with potential long-term consequences.

E-liquids can include cancer-causing toxins and combustible products that release aldehyde particles that linger deep in the lungs. In addition, some recent studies have found associations with e-cigarette use and future heart and lung disease.

What are some other potential harms?
Defective, improperly manufactured or modified electronic vapor devices have been known to explode causing burns, injury, or death.

E-liquids contain high concentrations of nicotine and can be absorbed directly through the skin making them particularly dangerous.

Improper handling, labeling, and storage of nicotine containing e-liquids can lead to toxic levels of nicotine poisoning. Small children and animals are especially vulnerable.

Even 1 mg nicotine can cause mild toxicity in young children.

Who is this available to?
Currently Vermont prohibits the sale of tobacco substitutes, including e-cigarettes, to persons under 18 years of age.

A retail license or permit is required to sell e-cigarettes in Vermont.

Many of these devices and their components are also available for sale over the internet, including flavored vape products.

FACING THE FUTURE

One cigarette contains up to **30 mg Nicotine**.

One e-cigarette or refill cartridge contains up to **24 mg Nicotine**.

E-cigarette refill bottles can contain up to **240 mg Nicotine**.

According to the National Institute of Health 2018 *Monitoring the Future Survey* nicotine vaping in 2018 increased by **3.4%** in 8th graders, **8.9%** in 10th graders, and **10.9%** in 12th graders.

The 10th and 12th grade increases are the **largest ever recorded** for any substance in the 44 years that the *Monitoring the Future Survey* has tracked youth drug use.

E-cigarette companies increased advertisement spending from **\$6.4 million** in 2011, to **\$115 million** in 2014.

Learn more at:

<https://e-cigarettes.surgeongeneral.gov/>

<https://www.nmepc.org/poisons/n/nicotine>

<https://www.cdc.gov/vitalsigns/ecigarette-ads/index>

Evaluation of effectiveness & limitations

- ▶ Time constraints surrounding the development of this project limited evaluation of the fact sheet in use beyond a few qualitative assessments of the fact sheet during patient encounters.
- ▶ The fact sheet is only available in English. Non-English patient populations will have limited benefit.
- ▶ Possible avenues to evaluate effectiveness of the fact sheet, is a short pre-intervention questionnaire on patient understanding of vaping/e-cigarette use prior to administration of the fact sheet and then directly afterwards.
- ▶ Questions can include scales (unlikely, somewhat likely, likely, very likely) of how likely they thought they would be to vape in the next 30 days, and how many times they have vaped in the past 30 days.
- ▶ A further questionnaire can be emailed to them to complete 1 month later with these same questions to see if vaping practices had changed post intervention.
- ▶ For convenience purposes these could be done online through SurveyMonkey or similar online tool.

Recommendations for future interventions

- ▶ Developing a fact based preventative health presentation that health care providers can use to specifically address e-cigarettes in tobacco preventative and smoking cessation interventions in youths.
- ▶ Encouraging open discourse about the topic among youth patients and their families.
- ▶ Working together with local schools and students to develop more curriculum aimed at every grade level addressing e-cigarette use and vaping.
- ▶ Posting the fact sheet as part of a database of online resources available for patients to view rather than a handout given only in the office could further disseminate the information.

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