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VAPING IN TEENS

Developed by KAYLEE NOVACK and Dr. NICHOLAS CHADI for PedsCases.com.
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Introduction

Hi everyone! My name is Kaylee Novack and I am a medical school graduate and current master's student at the University of Montreal. In this podcast, we will present an introduction to vaping, explain how to approach the topic with adolescents in the clinic, and provide some brief information about treatment for problematic usage. Dr. Chadi, a clinical assistant professor in the department of Pediatrics at the University of Montreal and a clinician-scientist specialized in adolescent and addiction medicine working at the Sainte-Justine University Hospital Center for children guided me in developing this podcast.

Learning Objectives:

The learning objectives of this podcast are:

1. To discuss the basics of vaping and the known associated risks
2. To discuss the pediatrician's role in vaping prevention
3. To propose a framework for discussing vaping with adolescents
4. To discuss harm reduction in the context of vaping

In this podcast, I have the pleasure to be interviewing Dr. Chadi who has done significant research and advocacy work related to youth vaping and tobacco use and who will help us to get a better understanding of these learning objectives.

Interview

Hi Dr. Chadi. Thank you so much for joining us today.

Hi Kaylee.

1. To start off, and as a bit of an introduction, could you explain to us what is vaping and how does it work?

Absolutely. Vaping started becoming more popular around the beginning of the years 2000. The first vaping devices looked a lot like traditional cigarettes but made of plastic. With time, they evolved, and we've seen several models emerge including models that looked more like pens and then eventually like USB keys with pods that are disposable so refillable or changeable cartridges that allow people to reuse these devices as they use them. When we think of vaping devices or E-cigarettes, in general, they all have a common structure. There is a battery connected to metal coil that eventually heats up and is connected to a reservoir, that could be small or a little bit larger, which contains a liquid.

Most of the time this liquid will contain nicotine or cannabis and some flavoring. Once the liquid is heated up it becomes what we call an aerosol, so a mix of water vapor and then some fine particles that are in suspension including a number of different chemicals. We know that the nicotine contained in an E-cigarette can vary in concentration. There are recent laws in Canada stating that we cannot sell cartridges or liquids that contain more than 20 milligrams per ML of nicotine but some stronger or higher concentration liquids are still in circulation. So, this aerosol can contain quite large quantities of nicotine and we sometimes say that we can compare one small 1 or 2 milliliter POD to the equivalent of more or less one or two packs of cigarettes in terms of nicotine

> **2. I think it's great you clarified that because it is different from smoking cigarettes and because of this people may think the risks associated with each are different. As medicine medical students, we learn a lot about the risk associated with smoking but less about the risks associated with vaping. Can you tell us, then, about the risks specifically associated with vaping and E-cigarettes?**

Yes. I like to divide the risks associated with E-cigarette use into two categories: the more acute risks and the more long-term chronic risks.

What we know is that there are some risks of getting injured acutely with using E cigarettes. There have been cases reported of acute lung injuries or episodes of young people getting burned from their E-cigarettes malfunctioning. We've also seen young children actually ingesting the E-cigarette fluid leading to intoxication and acute injuries. We know of those injuries and they are mostly related to the chemicals that are contained in the aerosols or in the E cigarette liquids.

What is less well known is the longer term effects and health risks related to vaping. Because E-cigarettes are relatively new, we still need more time to know how they would compare, for example, with the long-term health risks of traditional cigarettes that we've been studying for decades and decades.

However, the existing research suggests that there seems to be definitely some risk to lung health because E-cigarette aerosols can lead to increased inflammation and irritation in the lungs, which can then lead to increased cough and exacerbation of chronic lung disease, for example. We know also that young people complain more of having shortness of breath and wheezing when they use E-cigarettes regularly. It'll be interesting to follow with time how this risk does compare with traditional cigarettes. We also think that based on existing studies done in animal models and some human studies that E-cigarette aerosols can lead to increased cardiovascular risk due to increased inflammation to blood vessels and can also lead to most likely carcinogenic risks.

Other risks that are important to keep in mind are related to the actual substances that are found in E-cigarette liquid. I mentioned many E-cigarettes will contain nicotine and/or cannabis. Because those can be found in high concentrations, we would think of the risk of developing nicotine or cannabis addiction or both. We also know that the use of E-cigarettes among youth is associated with use of traditional tobacco products. So, if you use vaping devices, you're more likely to then use traditional cigarettes or other tobacco products but also all other substances, including alcohol and cannabis and illicit drugs. We know that using substances when young can have several different health risks on mental health, emotional regulation, increased risk of having anxiety or depression symptoms, and eventually perhaps addiction or problems related to substances themselves. As we can see, several health risks, both more acute and longer term and we're starting to learn more and more of these as we go.

3. It's very important, then, that children, adolescents, and their families know about these risks. Where do you see the pediatrician fitting in in terms of vaping prevention and education?

Just like for smoking education and prevention pediatricians are in a key role to educate young people in parents about the risks of E-cigarettes. It's very important for pediatricians or pediatric health providers to stay educated on what we discover about vaping because during regular health assessments or even emergency health visits there's an opportunity for counseling. Pediatricians can also have a very strong voice in trying to help influence or guide public health or government regulations. The Canadian Paediatric Society has been involved with significant advocacy to try to increase safety of packaging of E-cigarette products and so we're seeing evolving laws and regulation to try to make E-cigarettes and vaping products less appealing to youth and less accessible to youth. As we've seen last summer, federal regulations since July 2021 have limited nicotine content in E-cigarette liquid. Pediatricians, as like other health providers, can definitely help advocate in that direction and conduct or support research trying to better understand the effects of vaping and how we can avoid harms related to that for a child and adolescent health.

4. Right! So, there's work to do on many fronts is what I understand but pediatricians really do play a key role. As a pediatrician, then, how do you decide which patients you should be screening for vaping and how do you decide when vaping should be addressed?

According to the most recent Canadian Paediatric Society position statement on vaping and youth, we should be discussing as pediatric health providers vaping with all teenagers aged 12 and above and sometimes younger if appropriate, especially if a young person mentions that their friends are using vaping devices or siblings, that they've been exposed or that they're curious about them.

And why would we start asking and counseling at that age? Well, we know that vaping is quite widespread among Canadian youth. In 2019, just before the pandemic, just a little over 1/3 of adolescents aged 15 to 19 reported having tried a vaping device at some point in their life and about 15% were reporting vaping in the past 30 days. This is nearly five times more than among adults aged 25 and older. So, a lot more young people than older people use vaping devices and most of them don't use them for smoking cessation, as was once meant to be the purpose of these devices to be a harm reduction or cessation tool for adults. We see that it's really not what's happening with young people. We see that use tended to increase in the past decade and that there's been a bit of a stability or plateau since the beginning of the pandemic which may be related to several different reasons. There seems to be an increase in the frequency in use among those who do use. So, the intensity of vaping seems to be increasing. And because we know that a large majority of young people who vape have not tried traditional cigarettes yet but may be pushed to try them after that, there's definitely an opportunity for early prevention.

I've mentioned the associations between vaping and other behaviors. So, around the age of 12, when young people start getting into high school age or middle school age, depending on the province you live in, is definitely a good time to start addressing this as part of a comprehensive health assessment for adolescents. It is also definitely interesting and important to discuss vaping with parents just to tell them a little bit more about what it is, to encourage them to get educated, and especially to tell them not to give or buy vaping products for their children as something that would be healthy because it's not.

5. So, this is really a subject that should be mastered by students, given how important the problem is. Do you have tips for us about how to start the conversation about vaping when we see adolescents in the clinic and also once we do have this conversation how often should we go back to it with the patients afterwards?

As with any discussion on a bit of a more sensitive topic with preteens or teens, it's good to discuss confidentiality and the limits of confidentiality before we dig in. If it's a young person who's closer to the age of 12-13 (depending on the province you live in) it may be that we will be upfront and say that if we are worried about something about their mental health or about their substance use we may have to tell that to their parents. But if they're older and we really want to promote a therapeutic alliance, we can say that we will listen and that we will only be divulging the details of their use if we see that there is immediate harm or risk to their safety. This will allow young people to know where their information is going to go, if it's going to stay between you and them or if it's going to be shared with an adult.

In terms of general tips, it's good to start with some more general topics before we go into things like substance use or other sensitive topics like sexuality, for example. We may want to ask about home life, school life, hobbies, using the HEADSS approach that we use a lot of time with adolescents in adolescent medicine. Then, when we get to the topic of vaping, we may want to start by normalizing, saying things like **“**many teens these days may be tempted or may be seeing vaping around them, is that something that some of your friends have done? Or something that you have tried in the past?” So just bring it in a more kind of conversational style and trying to use vocabulary that feels right to you, so trying to use the words that you know. If young people do use words that you don't know or don't understand well you can just ask them what they mean by that and if they can clarify so that you can have a bit of a conversation with them.

If you have this conversation with them on a first visit, well you may want to follow up on that, especially if you've heard that there is use. There is no maximum number of times you may want to discuss vaping because it's something that can evolve and change very rapidly, even within a school year with young people especially around 12, 13, 14, 15 as the rates of vaping have really increased in the overall population.

6. Great. And then more specifically, once the conversation is started, what type of information are you looking for when you ask your patients about vaping? And are there specific questions that you do ask?

Great question. There is a clinical tool developed by the Canadian Paediatric Society that's been created specifically for that, to help guide clinicians in how to structure their interviews around vaping once they found that there actually is vaping. In this tool we highlight 6 different categories of questions:

Those include asking about **the product itself**. What type, what brand, are there cartridges, is it a disposable E-cigarette, is it the cigarette with a larger reservoir, does it come from an illegal vendor or an illicit vendor? All those are relevant questions, in terms of trying to find out the safety of the product.

We may want to ask about **vaping substances**. Again, the type of liquid, does it contain nicotine or THC (the active element in cannabis) and how much of it, are there flavors or other substances that are mixed in?

We may want to ask about **motives**. When did young people start and why, why do they continue, what do they like, what do they like less about vaping?

We also want to ask about **context.** How does it fit into their daily life, do they do it as soon as they wake up, do they do it at bedtime, do they do it at school, at home? This may help guide the rest of the conversation, in terms of setting goals.

We may also want to have a sense of **the frequency and intensity**. How many days a week or times a day and is it regular throughout the day, how many cartridges or pods or amounts of liquid is used in a certain amount of time?

Then we may want to ask about **vaping related harms** and if young people have tried to quit, or if they have signs that they have some form of addiction to nicotine or cannabis. Or if they tried to quit and had not been able to, do they feel unwell when they tried to quit and have withdrawal, do they have cravings when they quit, have they had injuries or respiratory symptoms with vaping and all of those types of vaping related harm questions are interesting to ask.

> **7. Something that may be more difficult for students, and this was definitely the case for me, is being able to decide once I've gathered all of this relevant information if a teen's habits constitute problematic use, dependence, or addiction. So, how do you decide if the teen's vaping habits are problematic?**

Well, because rates of vaping are quite high and we know that it's the majority of young people who vape more sporadically and not regularly, well still there are numbers of young people who do vape regularly and have a problem with it.
I would say my main recommendation would be to screen for vaping as part of a comprehensive screen for substance use, including alcohol and cannabis and tobacco products which are the most commonly used products and substances in young people, using a general screening question, which could be a single question for each of these main substances. We can start by asking a single question like, "in the past year how many times have you used an E-cigarette, a vape, or a vaping product and then wait for the response. If it's a response that tells you it's every week or every month or less than that, well it will give you an indication of the level of risk. Generally, when young people tell you that they vaped every week or more, they probably have some form of substance use related problem with this this vaping habit.

We may also want to ask the same question, in the past year, how many times have you used cannabis or alcohol and then wait for the response. Then we will get a more comprehensive picture of their overall substance use behaviors.

If you want to dig in a little bit deeper there's some other tools like the CRAFFT tool which is a screening questionnaire to help identify problematic use. CRAFFT is an acronym for:

1. Having been in a **car** with someone who has used a substance
2. Using substances to **relax**
3. Using substances **alone**
4. **Forgetting** things that happened while using a substance
5. Having **family or friends** mention that substance use is a problem
6. Getting in **trouble** while using substances

This CRAFFT acronym can help see if there are problems related to vaping or other substances and can point us towards the probability of having an actual substance use disorder. There are training tools that can be used like that but I would say most importantly asking one good screening question to see if there is or there is no use of vaping in the past year or several months will help us guide the kind of next parts of the conversation.

Then we can ask some questions that are more specific to vaping addiction or nicotine addiction itself and there are screening tools for that. But I would say that that would maybe come later, once we've established what the overall problem is with substances.

> **8. Once you've established that there is problematic usage or that your patients are interested in stopping or reducing, how do you guide them in achieving these goals?**

The first thing that should be done is really having a conversation and engaging in what we call motivational interviewing. Motivational interviewing is really a type of conversation where we try to see eye to eye with the young person, try to listen to what they are feeling, what they are wanting and to try to help them come up with and set their own goals. This conversation style, motivational interviewing, is accessible to all clinicians, can take only a few seconds or minutes, and can be done in highly effective ways in an office practice or in a short clinical visit.
Once we've sort of engaged in that conversation, we can decide with the young person whether there is need for more regular follow up, for example, with a counselor or do we want engage in a more formal type of psychotherapy or do we want to think about other approaches that can come together like mindfulness interventions to help them with their cravings or you know change things in their everyday life so that they can go back

to other more healthy habits. All of those come together in what I call the behavioral interventions.

And then some young people can benefit from pharmaceuticals. In that category, I place nicotine replacement therapy. In there, we have longer-term agents and shorter-term agents. For example, with longer-term patches, we can try to find an equivalence in terms of how much nicotine they are using and how strong the patch should be to replace that amount of nicotine and prevent cravings, if young people try to quit.

A full-strength patch is 21 milligrams and is the equivalent of a pack of cigarettes a day or more or less the equivalent of a 2 ml, 2% pod (which is also equal to 20 mg/ml vaping pod) in terms of nicotine. When we have that amount of usage every day, we can go with a full-strength patch and then titrate down if we have a little bit less use. We may want to add a shorter-term agent like a gum or a lozenge, to help with cravings in the moment.

So, combining behavioral interventions with nicotine replacement therapy can be helpful. There are also some medications that have been more studied in adults and especially for smoking cessation that can be considered like bupropion or varenicline, but usually in older individuals and maybe not as a first line treatment.

What is really, really, really important to know is that we should never recommend vaping as a first step for smoking cessation. Even though vaping devices are sometimes marketed as a smoking cessation tool or harm reduction tool, this really has not been studied in young people. In clinical practice, we will often see that, actually, if young people switch from smoking to vaping, they may increase their consumption of nicotine because it's a different experience, the flavors make it pleasant, and so on and so forth. So, that's a key message to keep in mind

> **9. We spoke just now about helping teens who are ready to quit or ready to reduce their usage. I imagine that's not always the case with the teens that you see, especially because you work in addiction medicine. So, how do you guide or help patients who are not yet quite ready to stop or reduce their use and is there a way to use a harm reduction approach?**

Well, absolutely. So, it's not always an easy conversation, well I mentioned it could be a sensitive topic, and sometimes young people I see really are happy to engage in that habit and they see more benefits than harm. As mentioned before, starting slowly with some motivational interviewing techniques, trying to listen, and trying to see, what are the actual pros and cons of vaping and there are some obvious ones. Usually, it costs money, it could get them into trouble at school or with family or with friends, there's some health harms that we may want to share with them. It's not a lecture that we want to give teens, maybe tell them about the risk for addiction or perhaps the risks for the

lung and the fact that some of those long-term impacts have not been studied. So, with these few things we may want to just plant a seed and see how they respond to. Usually, if we continue to talk about this as we follow up with patients in regular care, there's going to be some opening, usually for some discussion at some point. But, really, it's a question of trying to understand a young person and to see where they are at and meet them there.

I can think of several examples of young people who just weren't ready to quit and didn't want to. Some things that we can do is say, well, OK you're not ready to quit or you don't want to reduce but how about maybe taking a break of vaping for a few days to see if you can do it, to see if you're actually not addicted and maybe save a little bit of money or even reduce your tolerance to make it that if ever one day you want to quit it wouldn't be as hard. I've done that with quite a few of my teens and it's surprising to see how they respond to that, even though they really don't want to quit. The idea of taking a break or being able to be free of that that vaping habit for a short period of time maybe seems like a more accessible first step.

10. I have one last question for you Dr. Chadi. This is something that applies every time we see adolescents in the clinic and also specifically to vaping. It could be difficult to know what to discuss with parents and what to keep confidential. In terms of vaping, where do parents fit into the discussion and do they have a role to play in vaping prevention and cessation?

That is a great question and sometimes a tricky question because, as I mentioned earlier, we want to discuss confidentiality and make it so that it's a safe space for young people to disclose their information to you. So, when do we involve parents, is if we're worried about immediate safety or if we hear of other substance use behaviors or even suicidal thoughts. Then, we have to involve them right away.

But then, if we're not immediately worried, and we want to continue building our alliance, we may want to suggest or ask the young person what they've discussed with their parents and if maybe we could help them discuss some elements about vaping so that their parents can support them and help keep them safe. Parents will often want information or be very, very worried to hear that their young person is vaping. Some parents, on the contrary, are not that worried.

It's also good to just share some general information and it can be done in the presence of the young person in a more general way. If we don't want to disclose specific details, we can just say, I want to offer you some information or direct them towards some credible websites, like the Health Canada website or the Caring for Kids website from the CPS (Canadian Paediatric Society) that has good and updated information on vaping and some of the key harms that parents should know.

It could also be a good opportunity to counsel parents about their own use of vaping products and tobacco products. We can tell them about the risks of second-hand aerosols or second-hand smoke and say that by not using in the home or not using it at all they can model good and healthy behavior for their children. That holds for vaping and substance use, in general.
So, there are many topics that can be targeted with parents and offering education is good but we also want to balance keeping and maintaining confidentiality with young people especially if we're trying to build an alliance with them.

Thank you so much Dr. Chadi for your excellent insight on the topic. To conclude, I will circle back to our learning objectives and provide some key take-away messages.

Conclusions:

1. Vaping is relatively new and long-term health risks are unclear. But usage is associated with several pulmonary symptoms, possibility of vaping associated lung injury, dangerous accidents, poor cardiovascular health in the future, nicotine, cannabis, or other substance use related problems, and mental health risks.

2. Pediatricians have a key role to play in preventing E-cigarette usage. Vaping should be discussed with all adolescents aged 12 and over during the standard HEADSS interview and there are several tools (single screening question, CRAFFT, and the Canadian Paediatric Society Clinical Tool) that can be used to ensure that the necessary information is collected. It is essential to always discuss confidentiality before addressing more sensitive topics such as vaping. Being confident and normalizing the topic will be key in this process and will help the patient develop a sense of trust and be willing to share information.

3. Harm reduction is essential in discussing vaping with teens. These are difficult problems to address and helping teens make positive changes requires persistence, an open attitude, and the willingness to meet them where they are on their journey towards decreasing use and eventually stopping. Continuing to screen at each appointment, to provide a judgment-free space, and to provide resources and treatment options are all essential in the harm reduction approach.

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