



Dr. Stukus: Hello and welcome to Conversations from the World of Allergy, a podcast produced by the American Academy of Allergy, Asthma & Immunology. I'm your host Dave Stukus. I'm a board certified allergist and immunologist and serve as a social media medical editor for the Academy. Our podcast series will use different formats to interview thought leaders from the world of allergy and immunology. This podcast is not intended to provide any individual medical advice to our listeners. We do hope that our conversations provide evidence-based information. Any questions pertaining to one's own health should always be discussed with their personal physician. The Find an Allergist <http://allergist.aaaai.org/find/> search engine on the academy website is a useful tool to locate a listing of board-certified allergists in your area. Finally, use of this audio program is subject to the American Academy of Allergy, Asthma & Immunology terms of use agreement which you can find at <http://www.AAAAI.org>. Today's edition of our "Conversations from the World of Allergy" podcast series has been accredited for continuing medical education credit. The American Academy of Allergy, Asthma & Immunology is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. Information about credit claiming for this and other episodes can be found at <https://education.aaaai.org/podcasts/podcasts>. Credit claiming will be available for one year from the episode's original release date. Today we are pleased to welcome Dr. Michelle Hernandez who is an Associate Professor of Pediatrics in the Division Pediatric Allergy, Immunology and Rheumatology at the University of North Carolina. Dr. Hernandez serves as the Director of the UNC Health Research Network and Associate Medical Director of the UNC Children's Allergy and Asthma Center. Dr. Hernandez is an accomplished physician scientist and her area of translational research focuses on asthma and in particular, the impact of inflammation. Today we're going to discuss a very hot topic at this time which revolves around issues pertaining to electronic cigarettes and how their use can impact respiratory disease. Dr. Hernandez, welcome to the show and thank you so much for taking the time to join us today.

Dr. Hernandez: Thank you for inviting me, I'm really excited to talk about this topic.

Dr. Stukus: Oh great, well I think it's going to be very informative for our listeners. So before we take a deep dive into it, let's just start with some basics. Help us understand some of these important definitions because I hear a lot of different terms out there. So can you explain for us what are e-cigarettes or e-cigs and how do they relate or differ to vaping?

Dr. Hernandez: Yeah, that's a great question because this was very confusing to me when vaping in that terminology came out. So e-cigarettes refer to a group of products called electronic nicotine delivery systems or ENDS, but that's really hard to say so everyone just refers to them as e-cigs just to keep it simple. And so a typical e-cig is comprised of three components, there's a power source which is typically a rechargeable lithium battery, there's a heating element that is then supposed to heat up a reservoir containing e-liquids. And so these e-liquids have a couple of components to it typically, there's a solvent

which can be vegetable glycerin, propylene glycol or a mixture of that, there can be various flavorings and you can add nicotine in various doses. So the concept is you have this power source that heats up and aerosolizes the e-liquid which is then inhaled or vaped from the attached mouthpiece. So what we've all seen, you know, driving by cars, right, is that e-cig users release a vapor which has actually allowed people to adapt the word vapor into a noun that's used like vaping. So what's really interesting about it is that some of these devices have the capability of customizing the liquid blend to suit your preference and so if you want to make it without nicotine but you want it to taste like banana and you want like a really big puffy cloud, you add an extra amount of vegetable glycerin, something like that but there's other devices that come with these premixed pods. And so there's a lot of variety and customization to how you choose to vape. But what was really crazy, I even saw one device that looks like an asthma inhaler.

Dr. Stukus: Oh my gosh.

Dr. Hernandez: Yeah.

Dr. Stukus: Yeah, and we'll talk about some of the controversies especially with children and adolescents vaping in a little bit but I know some of them look like flash drives and you can hide them and take them into schools and things like that.

Dr. Hernandez: Exactly, and that one, the one that looks like the flash drive, it's called the JUUL and that device comprises about 75 percent of that e-cig market and that's the one that we really need to be aware of in terms of talking to our patients because a lot of people they don't even refer to it as an e-cig, when you talk about it, it's like, "Oh, do you do JUUL?" And so they are one of the ones that use these prepackaged pods that contain their proprietary e-liquid and again you have a variety of flavors. And there's even a disposable one that's smaller than a JUUL that a lot of kids are using and it's called a STIG and so it makes it very easy because you have the whole component there including the e-liquid and when you're done using it, you just throw it away and just use an entirely new one.

Dr. Stukus: Wow. Okay, so there's a whole lot to unpack here and I can't wait to discuss even more. So for the purposes of really everybody's information and education in today's conversation, e-cigarettes, e-cigs and vaping is all really the same thing.

Dr. Hernandez: Right.

Dr. Stukus: Okay, that's good to know. And then do you have a sense, I'm sure it's going to vary based upon where you go and device and things like that but a general ballpark, what does this cost for somebody?

Dr. Hernandez: That's a good question because in terms of the JUUL, like if you go for a JUUL for instance, you can go and get a JUUL that will have one pod which is equivalent to 20 cigarettes and so depending on your use, right, if you JUUL, if you have one JUUL a day, if you have a starter kit, it costs about 50 dollars and then if you go and get your pods then there's an inherent cost in that as well. And so just depending on how much you use it can actually get pretty expensive. It's sad to say there are some

programs out there where the more you buy, the more discounts that you actually get to get your refills on your pods, it's pretty crazy.

Dr. Stukus: Oh wow. Yeah, that's something that actually just popped in my head right now just thinking about the cost of all of this especially when we think about children and teenagers spending money on these devices so that's important to know, thank you.

Dr. Hernandez: Yeah, so it's not a cheap habit at the end of the day and that's what's really interesting to really understand about this, it's not cheap and again I'll give you JUUL as an example just because it's the one that's used the most, if you buy four pods of JUUL, it costs you about 16 dollars so if you're going through a JUUL a day, right, you're spending about 32 dollars a week independent of what the device cost you to maintain that habit.

Dr. Stukus: Sure, wow. Now help us clarify something else, so there's other forms of smoking, we're all familiar with tobacco and cigarettes and marijuana and cigars and things like that, but how do e-cigs differ from other forms like hookah, that's another hot topic among adolescents as well.

Dr. Hernandez: Yeah, and when I think about it, I think about hookah being sort of the original form of vaping, right? But when you think about it culturally, hookahs were used in the context of more social events and you go to this hookah bar. And bottom line what a hookah is, it's a single or multi stemmed instrument where you vaporize and then you can smoke a variety of things and it could be flavored opium which was used back in the day but it can also, you can use a hookah to have tobacco or even cannabis. The difference is that the vapor is passed through a water basin before you inhale it and it was thought that maybe the water would filter out toxic chemicals which was found not to be true after all. One of the reasons that people like the e-cig compared to the hookah, part of it is because hookahs are shared, right, when you see these multi stemmed instruments, so you have an added infectious disease risk. But what's also interesting is now kids are even sharing their vapes as well.

Dr. Stukus: Wow, okay.

Dr. Hernandez: I'm sure there's going to be a risk there too.

Dr. Stukus: Yeah, I know, so where I am there are I think 13 hookah lounges within a five mile radius of the major university here in town and it's a social encounter is what a lot of people use it for. Are we seeing the same approach to vaping, is that what kids are doing?

Dr. Hernandez: Well kids are definitely doing this in social context but because it's on-- because they're-- obviously they're not supposed to be using it, they're trying to be discrete about it, right? When we were growing up kids were smoking cigarettes in the bathroom when we were in high school, now it's evolved to now they're doing JUUL or STIGs in the bathroom so they're not as open about it, however in the young adults, in college age students that are legally allowed to buy this stuff then yeah, it's also being used as part of social events and part of the reason is because it doesn't smell like typical combustible cigarettes so it's definitely more accepted overall.

Dr. Stukus: Okay. I think that context is extremely helpful. And from what you've described so far, you're basically describing essentially a nicotine delivery device and we know that they've been marketed as reportedly being less harmful compared to traditional tobacco based cigarettes, but what does the science say, do we actually know if e-cigs are healthier than traditional cigarettes?

Dr. Hernandez: That's a great question because there is so much controversy especially among the lay public that are pushing back. So it is known that the e-liquids, solvents and the flavors are generally regarded as safe for oral consumption but it's a totally different thing when you heat and aerosolize something and then inhale it and so we don't know the long term effects as of yet. But I wanted to highlight what people actually are inhaling, right, because the concept or the misperception is it's this harmless water vapor, right, but it's not. So when you look at the chemicals that are actually vaped out, this includes formaldehyde and acetone, it can have volatile organic compounds such as benzene, you're vaping particulate matter and metals like nickel, copper, zinc, tin and even lead. And because you can customize this stuff, now people are adding THC or CBD oil to their e-liquid. So one of the problems that the research community has encountered is that because there are so many options to customize your e-liquid or even how much you heat it based on your personal preferences, it's hard to really understand what the global health effects are, right, because of the inherent variability in that. But what we do know so far, a lot of in vitro in animal models have been used to study these biological effects and they did find what we would expect, evidence of cytotoxicity, you can have increases in both TH1 and TH2 inflammation, you can dysfunction of your epithelial barrier and you can also impair your antibacterial and antiviral defense. But no one knows how this compares to regular combustible cigarettes, right, and that's always the comparison that comes up, "Well compared to regular cigarettes, how does this work?" And because this stuff has only been on the market a little bit over ten years, it's hard to really know what's going to happen in the long term. And you know what people always worried about were COPD and lung cancer and again, it's too early to know about that. But what we do know and this is where I really target kids with this, I think you and I have heard the reports of these e-cig batteries exploding, right and so one man in Texas died earlier this year from such an explosion and there was another exploding e-cig that took a part out of a teenager's jaw this past summer. And what we also haven't heard about as much but what has been reported a lot are actually seizures associated with e-cigs. So last month, the FDA announced that it had received 127 reports of seizures or other neurological symptoms possibly related to e-cigs and, you know, they're trying to figure out how vaping was directly linked or not but they think that nicotine toxicity was a possible culprit for these seizures.

Dr. Stukus: Wow, so that's a lot to digest and it sounds like there's really no great long term prospective randomized trial that's for sure.

Dr. Hernandez: Not yet.

Dr. Stukus: You also mentioned really no head-to-head studies looking at traditional tobacco based cigarettes versus e-cigs either, is that correct?

Dr. Hernandez: Exactly.

Dr. Stukus: Okay. And like you said, a lot of people are extrapolating a lack of data as meaning that it's safe but we just don't know.

Dr. Hernandez: No. And a lot of these in vitro in animal studies when you actually review the literature, you can say, "Oh, this is better than combustible cigarettes, this is worse," or, "It's the same," and again it's because there's just so much inherent variability in what they're using in their experiments that it's really hard to say what specifically contributes to a certain health effect and that's why it's so confusing.

Dr. Stukus: And you mentioned a lot about the different chemicals which I learned something new here, so much already. But the other thing that I think gets sort of blown past is the fact that there's nicotine in these devices and you mentioned.

Dr. Hernandez: Exactly.

Dr. Stukus: Some of these seizures may have been linked to them and things like that but what are some other things that people need to be aware of especially with adolescents who are vaping in regards to how nicotine can affect them?

Dr. Hernandez: Well, and that's a great question because a lot of these adolescents I guess they don't understand that the addiction piece is really primarily related to nicotine and the younger that they start consuming these products the more likely it is that they're going to become dual users and what that means is referring to someone who uses e-cigs but also regular tobacco products such as combustible cigarettes. And so it was well known that if you started smoking before you were 18, you were more likely to become a long term smoker and so now you have this whole new crop of nicotine addicted adolescents and because with a lot of these individual products, you can customize how much nicotine you add, you're obviously going to get a bigger hit than even with a regular combustible cigarette.

Dr. Stukus: That's scary, I mean it sounds like we're creating a whole new generation of nicotine addicts out there.

Dr. Hernandez: Exactly.

Dr. Stukus: Oh boy. Now you mentioned, I believe you said that these products have been available for about ten years or so, is that right?

Dr. Hernandez: Yeah, so they were introduced into the U.S. and European markets between 2006 and 2007 so they've been out for 12 years and then JUUL again which comprises most of the market, they came out in 2015 and there's a lot of different products that have come out obviously since then and obviously when you're driving down the road, you see all of these creatively named shops that are marketing towards vapers, so that market has gone crazy.

Dr. Stukus: Yeah, I see them all over town when I drive around, so absolutely. Now help us understand how e-cigs have been marketed so far, are there any specific health related claims that the manufacturers are making and if so, is there any evidence to support them?

Dr. Hernandez: Yes, that's a great question and the interesting thing is that after some of these studies have been out for a while, some of these manufacturers have had to change how they market their product, but overall they're marketed as reduced harm products. And it's actually been argued that their continued availability can reduce the burden of disease and disability associated with smoking combustible cigarettes. So it always goes back to comparing it to the combustible cigarette. What we have found is that plenty of former smokers who switched to e-cigs report reduced shortness of breath of mucus production. And I remember when I would hear about a patient, an adult patient switching from combustible cigarettes to e-cigs, back in the day, I'd be like, "That's awesome," right, because, "That's a move in the right direction and I'm so happy you're feeling better." But again as we found out more our opinions have changed. But regardless the long term effects we still don't know, right, lung cancer or cardiovascular disease, COPD because they just haven't been out that long. But others have argued, "Hey, this could serve as a possible smoking cessation aid." And so studies including randomized clinical trials have gone both ways in terms of whether it could be helpful or maybe it's not helpful which is why we as providers are all confused. So it's not definitive if e-cigs are a good smoking cessation tool and they think a lot of it is because of nicotine addiction. So it appears that e-cig use does promote switching from one form of nicotine delivery to another while only minimally supporting the recovery from nicotine addiction. And so a couple of groups out there have come out and say, "Look, if you have someone that's nicotine addicted, it is better addressed through FDA approved nicotine replacement therapy like using the patch or the gum along with medications like Wellbutrin and Chantix. But there's only select populations that with support can actually reduce their nicotine addiction through this switch where they can customize the amount of nicotine so that they can taper down the dose. So given all of this data, these e-cig manufacturers have had to become a lot more careful in the message that they're putting out there, so now when you actually read these websites, they now have changed it to say that this is a switching product and it's not intended to be used as a cessation product for nicotine addiction just based on the data that have come out.

Dr. Stukus: And in fact, we're recording this in mid-September, 2019 and just this week the Food and Drug Administration came out with some information as well, can you comment on that?

Dr. Hernandez: Oh yeah. And so as of September 6th, the CDC and the FDA came out with this joint announcement and they said people should consider not using e-cig products while they investigate some of the illnesses that have been identified in the news over the past couple of days. But the specific recommendations are, youth, young adults and pregnant women should not use e-cigs at all, if you're an adult and you don't use tobacco products, don't even think about starting e-cigs. If you do use them, you shouldn't buy products off the street, for example e-cig products that have THC, cannabinoids or pods that can be modified that are not intended to be used by the manufacturer. And again, if you have an adult smoker who's attempting to quit nicotine addiction, do a lot of counseling, help them with FDA approved medications but don't use e-cigs as the way to help them through this nicotine addiction until they investigate what's going on.

Dr. Stukus: Yeah, so thank you for summarizing that, I mean that's a pretty profound statement to come out from those two organizations that really discusses the harm from these, the dangers that can come from them. You know, in addition to what you mentioned in regards to smoking cessation, can you comment about how e-cigs have been targeted towards adolescents, we've already touched upon some of the dangers with adolescents specifically but what about the different flavored oils and what are some of the tactics that these manufacturers have used for that population?

Dr. Hernandez: Oh yeah, I mean that's where as a parent that's where my outrage comes because there's a lot of these products that are candy flavored and if you go buy these products, they smell absolutely delicious, and so for a kid to really understand that this vapor stuff that doesn't smell disgusting is bad for you, it's hard for them to understand, right, that concept in the first place. But in terms of marketing, there was this big problem that came about where because of these flavors and because of social media influencers there was this rampant increase in children using these e-cig devices and even after the manufacturers stopped directly marketing this stuff to kids after they got in trouble, now you have kids marketing to kids again through social media. So they think that the horse is already out of the barn, right, the damage has been done and so one of the things that a lot of organizations want to target is how do we prevent these deliciously flavored products from being accessible to kids in the first place and that's where as a society right now we're struggling.

Dr. Stukus: So really, I mean there's targeted marketing for a device and a product that smells good, it's sort of promoted as not being harmless necessarily but as being safe to a group that is at highest risk for developing an addiction to nicotine and then maintaining a lifelong addiction. Wow.

Dr. Hernandez: Right? Crazy.

Dr. Stukus: Yeah. So these are relatively new, it's only been about ten years or so and it takes a while to kind of get some population health data but do we have any sense surrounding the prevalence of e-cig use, do we know if there's any differences among adult smokers or adolescents and young adults and things along those lines?

Dr. Hernandez: Oh yeah, and there've been a couple of surveys that were recently published, one discussing adults more and then one specifically targeting children. And so there was a large survey from 2016 comprised of over 450,000 people, so this was a nice population and they found that 4.5 percent of U.S. adults were current e-cig users which corresponds to almost 11 million people. So of those, two million were sole e-cig users and nearly half of them were actually these dual users that used both e-cigs and combustible cigarettes on a regular basis. With kids, this is where the previous FDA Commissioner Scott Gottlieb was outraged. So the FDA and the CDC published results of the 2018 National Youth Tobacco Survey and they found that nearly 21 percent of high school students and 5 percent of middle school students had used an e-cig in the past 30 days which when you look at it, looks about 3.6 million kids. But what was most alarming is that these range represented a 78 percent increase from 2017 and they think that one of the reasons this happened was because of these e-cig advertisements targeted to youth. So research has shown that more than 28 percent of middle and high school students or about

20.5 million kids were exposed to e-cig advertisements from at least one source back in 2016, that's just insane.

Dr. Stukus: Wow.

Dr. Hernandez: Yeah, these statistics to me are troubling because we had made such amazing efforts in reducing nicotine addiction among youth over decades of public health efforts and now we've lost ground.

Dr. Stukus: Yeah, and we're as allergists and physicians and caring for both adolescents and adults, this is something that's really concerning for us and of course something we're going to avoid on this podcast for a lot of reasons, there's a whole lot of politics.

Dr. Hernandez: Yes.

Dr. Stukus: And money behind this that needs to be discussed and dismantled as well but that's a real problem what you're describing and it is kind of scary. Now you mentioned before about some of the effects on a cellular level in regards to inflammation and exposure to the chemicals involved in these devices, but can you comment on some of the health effects that may be related to e-cig use especially for somebody who already has an underlying chronic respiratory disease like asthma?

Dr. Hernandez: Yeah, and honestly this is one of the newer areas of research, but what's really interesting to know, to give a little background is that even among asthmatics, there is also this misperception that e-cig use is again, you're just inhaling this harmless water vapor and when you ask kids with asthma about e-cigs, they've noted that they felt that they were less likely to become addicted and that e-cigs were less harmful than cigarettes to themselves or to those around them which likely led to an overall increase in e-cig use among asthmatics and especially among the 18 to 24 year old group. But what we do know so far and it's limited, this data is still growing, there is a clear and reproducible association between e-cig use and asthma symptoms or an asthma diagnosis in both adults and kids and wheezing has been reported as more common among e-cig users compared with nonusers in both adolescents and adults. We actually had a pretty crazy experience down here at UNC Chapel Hill where there were two teens with asthma that had been vaping over a weekend and they developed such severe asthma that they were eventually placed on ECMO, that's insane, right? Then there's also symptoms of chronic bronchitis associated with e-cig use, so there was this large survey that came out of Southern California where high school juniors and seniors who had reported e-cig use had twice the risk of reporting respiratory symptoms consistent with chronic bronchitis. But obviously studies are currently underway to see what the long term effects of vaping are on whether people do develop asthma, what happens to asthma control and asthma exacerbations and especially for kids, what happens to lung growth overall while your lungs are still developing, if you're vaping what happens then?

Dr. Stukus: Oh boy so lots of unanswered questions but from what we understand so far, it sounds like this is not a safe choice for people to make especially if they have asthma.

Dr. Hernandez: Not at all.

Dr. Stukus: Yeah. Now what about the impact from secondhand exposure to e-cigs, do we have any idea how that can impact somebody with asthma or anybody for that matter?

Dr. Hernandez: So that's also an emerging area, so when you look at the literature there was an article published this year in CHEST where they asked kids ages 11 to 17 about exposure to e-cigs and their asthma and what they did find was that secondhand exposure was associated with higher odds of reporting an asthma attack in the last year but again we really don't know about the impact on asthma control over the long run. There was actually an article published that details how the study should be done to investigate how secondhand exposure impacts heart and lung health in both kids and adults. So I anticipate in the next couple of years we're going to get a lot of really interesting data seeing these secondhand effects especially among our adult smokers or our adult e-cig users.

Dr. Stukus: No, that would be great, yeah I'm sure that this is a hot area for researchers and I agree, I think we're going to see just an explosion in regards to the data that gets published surrounding this. Now as this is a somewhat rapidly evolving topic and our timing is really quite perfect in regards to some recent unfortunate events, again just for our listeners this is in mid-September of 2019 and there's been a lot of reports in regards to recent vaping related illnesses. Can you discuss how patients are presenting, what types of symptoms they're having, the severity of their illness, whether anybody's died and if we have any idea in regards to some common links behind these illnesses?

Dr. Hernandez: Oh yeah, so the U.S. health officials from the CDC and the FDA had a call on September 6th and at that point they had reported that there were at least 450 possible cases in 33 states of severe lung disease that could be caused by vaping. As of last night, there are now six reported deaths and the investigation into the cause of these illness is ongoing, but in terms of how they present, many of these patients were previously healthy and they came in with a range of symptoms that include shortness of breath, fever, cough, vomiting, diarrhea, headache, dizziness and chest pain, so you have some GI symptoms, you have some infectious, you know, it looks like a pneumonia kind of thing with the fever and the cough and the shortness of breath and a number of them have been admitted to the intensive care unit and placed on ventilators for what is being described as a chemical pneumonitis and this is after they rule out infectious diseases. Most of these individuals were between the ages of 18 and 25 and some patients have reported that their symptoms developed over a few days while others have reported that their symptoms developed over several weeks. So in terms of what the link could be, right, so as part of the investigation, the FDA requested samples to be sent to them for review and what they found that there were a variety of different types of products and substances, a number of which contained incomplete information about the product. But what they know so far is that there does not appear to be one specific agent involved in all of these cases although THC and cannabinoid has been reported in most cases. A lot of these products contained vitamin E acetate that is thought to contribute to the development of lipoid pneumonia. But as the investigation is ongoing, obviously as a public we're going to find out a lot more and I'm hoping that we can get some clarity on the specific agents involved here. What a lot of the manufacturers and the big companies have come out and said was, "The reason that this is happening is because people are using these products in a way that we did not intend and so people are modifying these things, they're adding THC, they're adding all of these other substances to it and that's why you're seeing the issue." And again that question still needs to be answered.

Dr. Hernandez: So we've seen patients with chemical pneumonitis before it's a relatively rare thing for us to see, I guess it depends on the types of patients you see and things like that but from what you're describing, I mean now that we have an increased prevalence of people essentially heating up chemicals and then inhaling them deep inside the lungs, it kind of makes sense, doesn't it?

Dr. Hernandez: Exactly.

Dr. Stukus: Yeah. And I want to go back to something you mentioned because with these scary-- I only anticipate that this is going to increase over the coming weeks to months unfortunately and that's what we've seen over the summer but you mentioned that they've ruled out infectious causes and it just dawned on me, as we head into cold and flu season I can only imagine that there's going to be a lot of these cases that represent in a very similar manner to something like influenza, enterovirus d68, any thoughts on what people should do when they see somebody acutely ill to try to differentiate the two?

Dr. Hernandez: Honestly besides what we typically do, right, to rule out infectious disease, I think we have to do a better job in terms of getting that history of the products that they've been using because what I've found is that when a lot of kids and anyone gets asked, "Do you use any tobacco products," right, they don't equate vaping to using tobacco products, so they just, they say, "No," because obviously they don't equate the two. So I think we have to be pretty concrete especially in these teenagers and young adults about these questions, "Do you vape? What do you vape? How much do you vape?" and we can get into that a little bit later but we have to start asking the questions especially because yeah, as you said all of this confounding with infectious disease at this time of the year, absolutely.

Dr. Stukus: Yeah. And again, this is so timely and I really hope to have you on again in the future because I have no doubt that this is going to be an evolving story on many levels. Let's go back to you mentioned the CDC recommendations and you really highlighted those very nicely but what types of legislation are being enacted surrounding e-cigs and especially surrounding minors or health claims or things along those lines?

Dr. Hernandez: Yeah, and so I think legislation is going to change a lot because now there's a lot of public outrage, right, given all of these reports and several members of Congress have asked for the FDA to act quickly to do something. But to give you a little bit of background of where we are, in 2016 the FDA extended its tobacco regulatory power under the provisions of the Tobacco Control Act and this included e-cigs, vapes, e-liquids, e-cigars, e-pipes and even e-hookahs. And so the overwhelming majority of e-cig users do use e-liquids containing nicotine which allowed them to get this regulatory power. But bottom line, it is illegal to sell e-cigarettes and any other electronic nicotine delivery device to someone younger than 18. Retailers then became legally responsible for requiring age verification by photo ID for someone that was under 27 and there was also a ban on distributing free products and they prohibited sales in vending machines. I didn't even know they sold in vending machines but apparently they do except they can do this in strictly adult only facilities but the enforcement has been the problem because as we talked about earlier a lot of people can purchase these products online and I'm just asked if I'm 21 years old and up. But to reduce youth demand, right, which is where we're having the biggest issue right now, many organizations have supported banning flavored e-cig products and again these flavors include candy

flavors, they include fruit flavors like mango and berries or crème brûlée. So last week the State of Michigan took a step and banned the sale of flavored e-cigs and several State Attorney Generals have asked the Federal Government to ban flavored vaping products nationwide.

Dr. Stukus: Wow, so that is, I mean there's some big steps being taken in a very rapid fashion especially just considering these have really only been on the market for a decade or so, that's quite impressive, and again, I'm sure an evolving story. As somebody who is as knowledgeable as yourself and I mean you're an expert in regards to this and you treat patients who have allergies and asthma and work with those families, how do you ask your patients about whether they're using e-cigs or if they vape?

Dr. Hernandez: So as part of any routine history, right, what we were trained to do was to say, "Do you use any tobacco products?" right, and so that verbiage just doesn't work. So in a nonjudgmental way, "Does anyone in the house smoke cigarettes or use e-cigs or vape?" Then especially for my younger populations, "Does anyone JUUL or use STIGs?" which again are these disposable pod based e-cigs that are really popular. You have to use the terminology that they're using and if you use JUUL or STIGs, these kids will likely get what you're getting at, you know? I also ask, "How about your friends?" And in these instances where we get to these teens with asthma, I'm concerned that they're vaping, I'll do this without the parent in the room just because this is part of the adolescent trying to gain more self-management options, they need to learn how to manage their asthma so this is part of the conversation as me as the provider and the patient just taking care of them. We also have a lot of flyers in the clinic rooms about vapings and its dangers, so our patients now know to expect these kinds of questions which I think has been helpful because it more normalizes the conversation that this is just something that we do. If they do vape which plenty of them do which is surprising and the parents are aware that they're vaping, we start getting into more of the specifics of what products are being used, how much, how often, do they contain nicotine or not and why they're using them in the first place. Because in some cases the intention was to transition away from combustible cigarettes and in some cases the parent was vaping, the kid wanted to try it and the parent said, "Oh, you know, well it's not as bad as combustible cigarettes so why not?" And so based on those questions, that informs the educational piece. But at the end of the day we have to have a good relationship with these patients and so we have to approach this in a nonjudgmental tone for them to be willing to listen and work with us instead of just hearing us lecture them because they're going to get that from anyone.

Dr. Stukus: What age do you recommend people start asking about this?

Dr. Hernandez: So I actually start this in late elementary school. So I have an eighth grade, I have a daughter in eighth grade, I have a son in fifth grade and my daughter told me when she started middle school that kids were using JUUL in the bathroom.

Dr. Stukus: Wow, that's disheartening and alarming. I think this is a good time and hopefully everybody who's listening whether you are a physician or a parent or all of us know somebody who has a connection to a child or a teenager, I hope that this has raised red flags and the alarm bells are going off that we need to start having these conversations not just with our patients but with our own kids, right?

Dr. Hernandez: Right, exactly. And every time one of these reports comes out, the nice thing is that my kids are now approaching me about these reports and telling-- they're like, "Oh Mama, this is so stupid to even start, this could kill you." I'm like, "Yes, that's exactly what I want you to say."

Dr. Stukus: Perfect. And now so do you have any tips on ways that you can discuss the potential harm of these products with patients and families, I mean this is always one of those conversations that a lot of us tiptoe around about cigarette smoke and cessation and things along those lines, so how do you do it, what's sort of the format that you use?

Dr. Hernandez: So first I think we have to come out and acknowledge that these things smell great and that a lot of people think that they're harmless water vapor, right, because we have to start the conversation with where they're at. Then we try to be concrete in that these vapors have a variety of chemicals that are terrible for your lungs and I spell out what they are because most everyone has heard about lead and formaldehyde and acetone that you use to take off nail polish, right, so you have to try to explain this in terms of things that they understand. So do you really want to be inhaling this stuff that we use for all this-- to preserve bodies for instance, right? Most also have nicotine in them which is highly addictive and it increases their risk of going on to smoke regular combustible cigarettes. But then I try to get into the drama part, right, people worry about being disfigured so we know that these cartridges have exploded and hurt people's faces that has disfigured them, we also know of people having seizures and obviously we've heard about all of these cases of chemical pneumonitis from e-cigs. And so what my kids actually told me to highlight was to say, "You know what, you don't want to be the person highlighted in the news for that crazy stuff that that e-cig did to you, you don't want to be on NBC Nightly News, it's just not a good thing." But at the end of the day I try to come back to figure out what was the purpose of the e-cig use for each case, was there an anxiety or mental health problem that led them to seek nicotine addiction and how can we help resolve that in a holistic way? If you have someone who wants to transition away from combustible cigarettes, right, how can I provide them good smoking cessation tools to be able to do that? But we have to be very concrete in how we discuss this with patients and again, as you said, we can't tiptoe around this.

Dr. Stukus: I'm just curious, do you ever utilize motivational interviewing tactics or anything along those lines?

Dr. Hernandez: You know, we haven't yet and that's something that we've been looking into and obviously we should all get more training and motivational interviewing for a variety of things, but yeah that's a great point.

Dr. Stukus: And then also out of just curiosity, so when you have this conversation with families, do they throw things at you and storm out of the room or do you find that it's generally well received?

Dr. Hernandez: It's generally well received because again, we try to approach it as not nagging you and not lecturing you, we want you to understand what's going on because at the end of the day it's your family, you have to make these choices. What is disturbing to me though, right is you're not supposed to be using this when you're less than 18 anyway and so when you have families that are partaking in this

together, right, how do we as physicians approach that and that's the question that still remains to me, I don't know what to do. Do you have any ideas?

Dr. Stukus: No, you just raised a whole other sort of area of concern of when it's a cultural or a familial norm, I mean now we're talking along the lines of addressing non-adherence issues and behavior change and I think we just have to take some of the same approaches perhaps that we've taken with other issues that are similar.

Dr. Hernandez: Yeah.

Dr. Stukus: Oh wow. Well Dr. Hernandez, I've learned so much by speaking with you and I could talk to you for hours and hours but I think that this is probably a great place to stop and I thank you so much for being with us. But before we go, is there anything else that you'd like to add or any take home points that you want our listeners to really remember?

Dr. Hernandez: I think especially over the next couple of weeks and months we really need to keep listening to these new stories, listening to these reports and I think what will relate to patients the most is hearing about these families that have been affected by all of these vaping related illnesses because I think when you can relate it to a child, the specific name of someone that has been afflicted by this, I think that's where that personal connection really can motivate people to change. And there was an interesting news story this morning about a 21 year old kid who has been on the ventilator now for a while and his parents are heartbroken and I think we need to access these stories and share these stories and, you know, these families are obviously heartbroken and they're sharing their stories but I think we need to help them get their message out as well.

Dr. Stukus: Excellent and thank you again for joining us today.

Dr. Hernandez: Oh, it's my pleasure, thank you so much.

Dr. Stukus: We hope you enjoyed listening to today's episode. Information about credit claiming for this and other episodes can be found at www.education.aaaai.org/podcasts. Credit claiming will be available for one year from the episode's original release date. Please visit <http://www.AAAAI.org> for show notes and any pertinent links from today's conversation. If you like the show, please take a moment to subscribe to our podcast through iTunes, Spotify or Google Play so you can receive new episodes in the future. Thank you again for listening.