

0:00:00 -> 0:00:03.833 Support for Yale Cancer Answers comes from AstraZeneca,

0:00:03.833 -> 0:00:09.037 now offering three FDA approved therapies for different forms of lung cancer.

0:00:09.037 -> 0:00:10.837 With more in the pipeline.

0:00:10.837 -> 0:00:13.506 When it comes to lung cancer treatment,

0:00:13.506 -> 0:00:15.307 one size does not fit all.

0:00:15.307 -> 0:00:18.66 Learn more at astrazeneca-us.com.

0:00:18.66 -> 0:00:23.385 Welcome to Yale Cancer Answers with doctors Anees Chagpar and Steven Gore,

0:00:23.385 -> 0:00:33.536 Yale Cancer Answers features the latest information on cancer care by welcoming oncologists and specialists who are on the forefront of the battle to fight cancer. This week

0:00:33.536 -> 0:00:39.136 it's a conversation about E cigarettes, vaping and cancer risk with Doctor Suchitra Krishnan-Sarin

0:00:39.136 -> 0:00:43.92 Doctor Suchitra Krishnan-Sarin is a professor of psychiatry at the Yale School of Medicine.

0:00:43.92 -> 0:00:52.479 Dr Gore is a professor of internal Medicine in hematology at Yale and director of hematologic malignancies at Yale Cancer Center.

0:00:52.479 -> 0:01:02.27 Well, this is really a timely topic with all that's going on with the recent tough crisis with vaping that came out of the blue it seems.

0:01:02.27 -> 0:01:06.608 Yeah, vaping has evolved or E cigarette users evolved over the years,

0:01:06.608 -> 0:01:15.531 and it's unfortunate that we had all these crises and especially young people who experienced a lot of lung damage and inflammatory conditions,

0:01:15.531 -> 0:01:18.194 and it's rather unfortunate. But you know,

0:01:18.194 -> 0:01:19.992 there are multiple devices

0:01:19.992 -> 0:01:26.561 on the market and they were generated with with a good cause in mind.

0:01:26.561 -> 0:01:28.144 And unfortunately

0:01:28.144 -> 0:01:31.683 they have taken on a life of their own.

0:01:31.683 -> 0:01:37.451 Do you think that the original motivation was to be able to wean people off cigarettes?

0:01:37.451 -> 0:01:49.837 Absolutely, I think the original devices which were developed by a Chinese pharmacist were actually created to offer smokers a cleaner form of Nicotine to help with their cigarette

0:01:49.837 -> 0:01:54.426 addiction. As most people who are in the cancer field know very well,

0:01:54.426 -> 0:01:58.7 tobacco, combustible cigarette smoke is one of the worst

0:01:58.7 -> 0:02:03.474 well known causes of cancer and a variety of other inflammatory conditions.

0:02:03.474 -> 0:02:09.883 So there has always been the hope that we would be able to get smokers to quit using their cigarettes.

0:02:09.883 -> 0:02:13.59 That has not always played out the way that we like it to.

0:02:13.59 -> 0:02:20.752 A lot of smokers still smoke despite having multiple health problems, despite knowing the health risks of smoking.

0:02:20.752 -> 0:02:26.532 So the idea here was that perhaps if you have a cleaner form of nicotine available to them,

0:02:26.532 -> 0:02:32.77 the underlying thought being that nicotine is the addictive substance in cigarettes and

0:02:32.77 -> 0:02:34.103 if you can replace

0:02:34.103 -> 0:02:36.769 that addiction with something else

0:02:36.769 -> 0:02:40.889 then perhaps smokers will be able to quit this combustible product,

0:02:40.889 -> 0:02:43.919 which is of course fraught with so many problems.

0:02:43.919 -> 0:02:50.949 And as you know, as everybody's heard, it has 4000 chemicals and causes combustion and has a variety of respiratory

0:02:50.949 -> 0:03:00.038 issues so I think the concept behind it was a positive one and the idea of potentially helping smokers quit with the cleaner form of nicotine,

0:03:00.038 -> 0:03:04.159 also called harm reduction, is not an idea that we should throw out.

0:03:04.159 -> 0:03:11.61 And yet, the success with either nicotine patches or nicotine gum, which are those that come to mind has not been terrific,

0:03:11.61 -> 0:03:16.151 right? Or not that many people are successful using patches or gum.

0:03:16.151 -> 0:03:18.187 Some people are. Yeah, absolutely.

0:03:18.187 -> 0:03:21.039 So there are a couple of problems with patches and gum.

0:03:21.039 -> 0:03:26.278 The main problem is that they do not deliver nicotine the same way that a cigarette does.

0:03:26.278 -> 0:03:34.379 One of the things that is most reinforcing about somebody smoking a cigarette is that initial peak in blood nicotine levels you get when you

0:03:34.379 -> 0:03:39.294 combust the product and you get an elevation in blood nicotine levels in your body.

0:03:39.294 -> 0:03:49.36 You don't get the same kind of delivery with the nicotine Patch or nicotine gum and most people who use these products don't like them because it's not satisfying their craving

0:03:49.36 -> 0:03:55.855 and their withdrawal symptoms. There are there have been studies which have shown that if you combine the two,

0:03:55.855 -> 0:03:59.425 for example, if you combine nicotine Patch and gum together,

0:03:59.425 -> 0:04:05.569 you have better outcomes because essentially what you're doing is you're boosting up that nicotine level.

0:04:05.569 -> 0:04:10.144 So there are ways of manipulating the existing products to make them work,

0:04:10.144 -> 0:04:16.06 but people are always on the lookout for something new that could be even more helpful now.

0:04:16.06 -> 0:04:20.086 Is there a difference between an E cigarette and Vaping?

0:04:20.086 -> 0:04:21.55 Are they just the same?

0:04:21.55 -> 0:04:23.197 It's a very good question.

0:04:23.197 -> 0:04:25.331 No, they are essentially the same.

0:04:25.331 -> 0:04:26.978 E cigarette is the device,

0:04:26.978 -> 0:04:30.149 vaping is the behavior that said people are vaping,

0:04:30.149 -> 0:04:36.31 you can vape whatever you put in the E cigarette device so they were originally created for nicotine.

0:04:36.31 -> 0:04:38.562 You can get them with nicotine.

0:04:38.562 -> 0:04:41.028 You can get them without nicotine.

0:04:41.028 -> 0:04:45.463 You can get them with a variety of flavors or without flavors.

0:04:45.463 -> 0:04:56.026 And nowadays you also get products which are easily manipulated and are being used to administer things like marijuana and a variety of other things,

0:04:56.026 -> 0:05:03.56 which in in a sense I feel is what the CDC is saying has led to the current crisis that we have right now.

0:05:03.56 -> 0:05:08.629 This so called black market or manipulative values of these devices now.

0:05:08.629 -> 0:05:12.749 The E cigarettes that one can purchase in some drug stores,

0:05:12.749 -> 0:05:17.358 for example. Can those be refilled with stuff from Vaping stores,

0:05:17.358 -> 0:05:19.732 or is it a separate device?

0:05:21.687 -> 0:05:27.831 There are a variety of devices on the market and each one of them can be manipulated.

0:05:31.74 -> 0:05:36.069 We started out with a device which was very rudimentary,

0:05:36.069 -> 0:05:40.05 which really did not even deliver nicotine that well.

0:05:40.05 -> 0:05:44.497 It was called a cigalike when it initially came out, the nicotine solution.

0:05:44.497 -> 0:05:48.887 And the device was not formulated very well,

0:05:48.887 -> 0:05:52.682 so people didn't really get enough nicotine from these devices.

0:05:52.682 -> 0:05:55.884 Overtime these formulations have become a lot better,

0:05:55.884 -> 0:06:01.401 so you have these closed systems which look almost like a cigarette and are called Cigalikes.

0:06:01.401 -> 0:06:05.314 Then they evolved into a variety of other systems.

0:06:05.314 -> 0:06:10.06 You have things called tanks which are refillable clear tanks that you can fill

0:06:10.06 -> 0:06:12.461 with any liquid that's on the market,

0:06:12.461 -> 0:06:14.201 you have things called mods,

0:06:14.201 -> 0:06:17.322 which are basically if you've seen people use them,

0:06:17.322 -> 0:06:20.264 these don't even look like cigarettes.

0:06:20.264 -> 0:06:23.745 It's a rectangular box like jewel thing.

0:06:32.747 -> 0:06:36.949 It's called box mods and you can put a variety of attachments onto them

0:06:36.949 -> 0:06:38.461 to make the vapor better,

0:06:38.461 -> 0:06:40.613 you know you can produce more vapor.

0:06:40.613 -> 0:06:43.29 You can change the resistance of the devices.

0:06:43.29 -> 0:06:52.072 You can change the temperature of the devices so you can make your vape experience a lot better and a lot of people who use these kinds of devices use

0:06:52.072 -> 0:07:00.855 them for shows. You know there are competitions that you can participate in, vape competitions for creating the smoke rings and smell.

0:07:00.855 -> 0:07:02.949 You're going back to school pranks,

0:07:02.949 -> 0:07:07.019 but you know they can do a lot fancier things with these devices.

0:07:07.019 -> 0:07:12.574 And now the newer generation device is the one that you probably heard the most about,

0:07:12.574 -> 0:07:14.593 which are the pod like devices.

0:07:14.593 -> 0:07:16.362 These are the jewel device,

0:07:16.362 -> 0:07:21.473 the jewel devices, the way they vary from the other devices is in multiple aspects.

0:07:21.473 -> 0:07:26.398 First they are very small and they are discrete so they can be easily hidden.

0:07:26.398 -> 0:07:31.762 The jewel is a closed system which means you cannot technically manipulate it.

0:07:31.762 -> 0:07:34.413 It comes with nicotine and it comes,

0:07:34.413 -> 0:07:37.569 with a variety of flavors,

0:07:37.569 -> 0:07:40.689 but now those have been taken off the market.

0:07:40.689 -> 0:07:47.927 The jewel also differs from the earlier devices because they use a nicotine salt in the device.

0:07:47.927 -> 0:07:55.598 It's called benzoic acid salt and this causes faster absorption and a faster peak blood.

0:07:55.598 -> 0:08:06.019 Nicotine level as opposed to freebase nicotine which is what is in all the other nicotine liquids that exist in the market now.

0:08:06.019 -> 0:08:08.624 Freebase, nicotine and salt differ.

0:08:08.624 -> 0:08:11.809 As I said most cigarettes contain freebase,

0:08:11.809 -> 0:08:16.04 nicotine

0:08:16.04 -> 0:08:18.358 which increase blood levels a lot faster.

0:08:18.358 -> 0:08:21.255 They are also supposed to be more palatable.

0:08:21.255 -> 0:08:22.93 Now this is what is said.

0:08:22.93 -> 0:08:25.119 I have not seen evidence of this,

0:08:25.119 -> 0:08:35.933 but it said that liquid's that contain nicotine salts can be used a lot more easily because they do not produce that harsh undertone that most freebase nicotine has.

0:08:35.933 -> 0:08:40.698 It stings right, it stings in the back of your throat or makes you cough.

0:08:40.698 -> 0:08:42.82 Or you know just tastes better.

0:08:42.82 -> 0:08:50.308 Jewe like devices. Just to follow up and answer the question you asked earlier.

0:08:50.308 -> 0:08:59.58 As I said, the market has evolved to now where there are jewel knock off pods where you can actually buy

0:08:59.58 -> 0:09:10.24 slower open pods and fill them with whatever you want and use them with the jewel device and then this has evolved into even other products which like the dualan

0:09:10.24 -> 0:09:12.451 dualan come in multiple flavors.

0:09:12.451 -> 0:09:19.692 So I think the problem with this market is in the quest to come up with the product that works for smokers,

0:09:19.692 -> 0:09:26.264 with the idea being that it needs to produce the maximum nicotine level it needs to be palatable.

0:09:26.264 -> 0:09:29.548 It needs to satisfy the smokers we have created.

0:09:29.548 -> 0:09:31.559 This market that is producing.

0:09:31.559 -> 0:09:36.875 all these devices, which unfortunately are also very attractive to youth,

0:09:36.875 -> 0:09:43.412 which is what has led to the huge youth epidemic that we have with the current CDC number.

0:09:43.412 -> 0:09:50.524 Saying that almost 27.5% of high school youth are using these devices regularly in the past month.

0:09:50.524 -> 0:09:53.182 Those are the numbers.

0:09:53.182 -> 0:09:55.768 So there are all these kids

0:09:55.768 -> 0:10:01.73 who have used these devices in the past month and

0:10:01.73 -> 0:10:04.089 I'm sure that not all 27.5%

0:10:04.089 -> 0:10:06.82 have used them every day in the past month,
0:10:06.82 -> 0:10:08.682 but a significant number did.
0:10:08.682 -> 0:10:15.138 And how does that compare to what cigarette users
used to be like in that population say 20 years ago?
0:10:15.138 -> 0:10:24.448 So it's probably I would say coming up to equivalent
standards and it's a little hard to make an apples to apples comparison with
these two products.
0:10:24.448 -> 0:10:28.606 The reason being that a cigarette is a combustible
product.
0:10:28.606 -> 0:10:32.58 You light it and then you have to use it up before it
burns out.
0:10:32.58 -> 0:10:35.475 With these devices you have the option of charging
it,
0:10:35.475 -> 0:10:40.215 taking a puff and then putting it back in your pocket
and then using it whenever you want,
0:10:40.215 -> 0:10:43.847 so it's not like it runs out at the same rate that a
cigarette does,
0:10:43.847 -> 0:10:51.429 which is one of the big problems that we have in this
field because we don't know how to quantify use of these devices and
0:10:51.429 -> 0:10:53.642 equate them to cigarettes. At this point,
0:10:53.642 -> 0:11:00.222 the only thing I can really think of is looking at
things like nicotine and cotinine levels which exist in both,
0:11:00.222 -> 0:11:01.644 so it's a different beast.
0:11:01.644 -> 0:11:03.419 I would say that cigarettes are.
0:11:03.419 -> 0:11:11.792 But I would say the users are about the same and
the scary thing about these products is how much they appeal to youth number
one.
0:11:11.792 -> 0:11:16.585 And my area of research is really an understanding
of youth substance.
0:11:16.585 -> 0:11:20.163 Youth risk behaviors and developing interventions
for it.
0:11:20.163 -> 0:11:23.678 So I have worked with a lot of substances in the past,
0:11:23.678 -> 0:11:34.99 but I've never seen anything grow so exponentially as
I have these products and it's pretty amazing how the appeal of these products
has just grown exponentially over the past
0:11:34.99 -> 0:11:36.99 few years. So what is the appeal?

0:11:36.99 -> 0:11:38.59 Is it that they seem cool?

0:11:38.59 -> 0:11:40.601 I mean, I understand the flavors,

0:11:40.601 -> 0:11:46.166 but you know, kids can get flavors from chewing gum and all sorts of candy and other garbage,

0:11:46.166 -> 0:11:48.12 So we've been

0:11:48.12 -> 0:11:51.494 looking into this quite a bit in our work.

0:11:51.494 -> 0:11:52.855 And we still need to

0:11:52.855 -> 0:11:55.577 understand the full picture,

0:11:55.577 -> 0:11:57.768 but here's what I think is going on.

0:11:57.768 -> 0:12:00.668 First of all, you get multiple kinds of devices,

0:12:00.668 -> 0:12:02.562 right? So it's very innovative.

0:12:02.562 -> 0:12:05.167 You can do smoke tricks with these devices,

0:12:05.167 -> 0:12:07.179 or vape tricks with these devices.

0:12:07.179 -> 0:12:09.994 That's another innovative aspect of things.

0:12:09.994 -> 0:12:12.36 Kids who are that in that age range,

0:12:12.36 -> 0:12:22.019 teenagers are really looking for things that they can make their own and yet give them this innovative aspect of it

0:12:22.019 -> 0:12:24.066 There always being told,

0:12:24.066 -> 0:12:26.113 don't do this or don't do that.

0:12:26.113 -> 0:12:30.59 Here is something that they can manipulate to kind of make their own.

0:12:30.59 -> 0:12:34.94 They can choose from anywhere between 7 and 15,000 flavors.

0:12:34.94 -> 0:12:38.44 There's an amazing range of flavors out there.

0:12:38.44 -> 0:12:42.144 They can choose to use it with or without nicotine.

0:12:42.144 -> 0:12:45.919 They can choose to put marijuana in it if they want,

0:12:45.919 -> 0:12:47.842 or they can choose to add things

0:12:47.842 -> 0:12:51.048 or use it with other things,

0:12:51.048 -> 0:12:58.386 so I think the innovative aspect of these devices is really what draws kids to these products.

0:12:58.386 -> 0:13:00.096 The flavors are a huge,

0:13:00.096 -> 0:13:05.082 appealing aspect of it. We have asked many about this over the years.

0:13:05.082 -> 0:13:08.929 We conduct longitudinal surveys in schools in Indiana
0:13:08.929 -> 0:13:15.576 and the New Haven County and flavors are one of
the top reasons why kids like these devices,
0:13:15.576 -> 0:13:18.006 like using them. They taste good.
0:13:18.006 -> 0:13:21.009 The other aspect, which they really like,
0:13:21.009 -> 0:13:23.868 is the fact that they're very discreet.
0:13:23.868 -> 0:13:27.514 One of the things we hear a lot from,
0:13:27.514 -> 0:13:31.873 teachers in schools, and we do a lot of work in schools
too,
0:13:31.873 -> 0:13:34.089 is that they're easily hidden.
0:13:34.089 -> 0:13:40.307 Believe it or not, there are actually sweat shirts you
can buy with holes
0:13:40.307 -> 0:13:41.879 where you can hide
0:13:41.879 -> 0:13:48.679 a jewel and so in class you can take a quick puff from
it if you if you need to.
0:13:48.679 -> 0:13:52.494 And they don't produce as much smoke as cigarettes.
0:13:52.494 -> 0:13:54.557 So again, they're very discreet.
0:13:54.557 -> 0:13:59.623 All these together make it a perfect storm for youth.
0:13:59.623 -> 0:14:03.562 Wow, this is a very fascinating and important topic,
but right now
0:14:03.562 -> 0:14:14.755 we've got to take a short break for a medical minute.
Support for Yale Cancer Answers comes from AstraZeneca, committed to pio-
neering the next generation of innovative lung cancer
0:14:14.755 -> 0:14:19.33 treatments. Learn more at astrazeneca-us.com.
0:14:19.33 -> 0:14:27.879 This is a medical minute about genetic testing which
can be useful for people with certain types of cancer that seem to run in their
families.
0:14:27.879 -> 0:14:37.323 Patients that are considered at risk receive genetic
counseling and testing so informed medical decisions can be based on their own
personal risk assessment.
0:14:37.323 -> 0:14:44.078 Resources for genetic counseling and testing are avail-
able at federally designated comprehensive cancer centers.
0:14:44.078 -> 0:14:47.965 Interdisciplinary teams include geneticists, genetic
counselors,

0:14:47.965 -> 0:14:55.089 physicians, and nurses who work together to provide risk assessment and steps to prevent the development of cancer.

0:14:55.089 -> 0:14:58.482 More information is available at yalecancercenter.org.

0:14:58.482 -> 0:15:02.12 You're listening to Connecticut public radio.

0:15:02.12 -> 0:15:04.535 Welcome back to Yale Cancer Answers.

0:15:04.535 -> 0:15:06.428 This is doctor Steven Gore.

0:15:06.428 -> 0:15:09.889 I'm joined tonight by my guest doctor Krishnan-Sarin.

0:15:09.889 -> 0:15:14.59 We've been discussing vaping, particularly among adolescents and youth,

0:15:14.59 -> 0:15:16.548 so it was really fascinating.

0:15:16.548 -> 0:15:18.442 But before the break,

0:15:18.442 -> 0:15:25.557 when you were telling me that how much flavor really is drawing the youth and this whole idea of discretion,

0:15:25.557 -> 0:15:33.85 I can certainly imagine the idea that you're getting away with something, and in the place where I get my haircut

0:15:33.85 -> 0:15:42.1 I think most of the stylists vape and they mostly use jewel and

0:15:42.1 -> 0:15:45.597 the person who cuts my hair is trying to get off of it

0:15:45.597 -> 0:15:50.407 but sometimes it is kind of hard to know whether he just took a drag or not.

0:15:50.407 -> 0:15:53.404 He isn't hiding it, but I mean it's so discreet.

0:15:53.404 -> 0:16:02.961 No, it's very true. I think one of the problems with these products is that it is discrete and also unlike cigarettes which give you the cues where

0:16:02.961 -> 0:16:07.207 there's smoke, it's irritating in the back of your throat.

0:16:07.207 -> 0:16:12.08 Things like that you don't have those cues here which are telling you OK stop.

0:16:12.08 -> 0:16:15.19 You know, maybe you shouldn't be doing this,

0:16:15.19 -> 0:16:24.241 and I say kudos to all the smokers who have quit cigarettes and who have quit using these products.

0:16:24.241 -> 0:16:29.078 If if they have quit and this product has been helpful to help them quit,

0:16:29.078 -> 0:16:32.216 that's wonderful and I think that's a great tool,

0:16:32.216 -> 0:16:38.732 but I would also add that this should not be an addiction that they should maintain for the rest of their life.

0:16:38.732 -> 0:16:41.293 We have studied for many years

0:16:41.293 -> 0:16:43.445 cigarette addiction.

0:16:43.445 -> 0:16:53.335 We have never really studied nicotine addiction and this is now opening up a whole bunch of problems and concerns that have been raised with the idea that somebody might

0:16:53.335 -> 0:16:56.418 be dependent on nicotine for the rest of their life.

0:16:56.418 -> 0:17:02.769 And you know, I think we all know that nicotine is an essential receptor on the human body and is involved in

0:17:02.769 -> 0:17:07.699 almost every bodily function the nicotinic acetylcholine receptors are everywhere.

0:17:07.699 -> 0:17:09.497 And if you are using nicotine,

0:17:09.497 -> 0:17:14.599 you're basically altering any systems that are related to the presence of this receptor.

0:17:14.599 -> 0:17:21.068 Is there anything known about the long-term health risk

0:17:21.068 -> 0:17:24.439 even if it didn't have nicotine or anything else?

0:17:24.439 -> 0:17:26.528 I mean, does that harm the lungs?

0:17:26.528 -> 0:17:28.009 Do we know?

0:17:28.009 -> 0:17:32.323 I mentioned earlier that there was exponential rise.

0:17:32.323 -> 0:17:38.85 and the science has not kept up with the marketing and the rise in the use of these products.

0:17:38.859 -> 0:17:45.059 So we're learning every day about what these products can do or what harm they can do or not.

0:17:45.059 -> 0:17:50.769 I will tell you that the products contain substances like propylene glycol and glycerin,

0:17:50.769 -> 0:17:53.34 which are used as solvents in the product.

0:17:53.34 -> 0:17:55.223 Some of them contain ethanol.

0:17:55.223 -> 0:18:03.317 You know these are all solvents that are used to dissolve the nicotine and or the various flavor chemicals that are put in there.

0:18:03.317 -> 0:18:05.386 The problem with glycol and glycerin,

0:18:05.386 -> 0:18:09.842 we're learning that they can have inflammatory reactions of their own,

0:18:09.842 -> 0:18:20.835 but they also, it appears create additional compounds when they're just sitting in there in the E liquid

0:18:20.835 -> 0:18:26.635 called acetals, and these acetals are also known to have inflammatory potential.

0:18:26.635 -> 0:18:28.59 I see now in addition to that,

0:18:28.59 -> 0:18:31.617 the flavor chemicals themselves are not benign,

0:18:31.617 -> 0:18:36.031 they're chemicals. They are things like benzaldehyde.

0:18:36.031 -> 0:18:39.941 You know all these things you find in your chemistry lab.

0:18:39.941 -> 0:18:44.069 Yeah exactly, and for those who don't know about diacetyl.

0:18:44.069 -> 0:18:53.384 Diacetyl is also what was in buttered popcorn flavor and it was found many years ago to be associated with bronchiolitis obliterans,

0:18:53.384 -> 0:18:55.18 which is a

0:18:55.18 -> 0:19:00.968 inflammatory condition, and so these flavor chemicals are not benign as of themselves.

0:19:00.968 -> 0:19:09.151 You know, they can have potentially inflammatory effects on the human body and the vape also contains

0:19:09.151 -> 0:19:15.204 metal particles which are generated from the battery or the heating element.

0:19:15.204 -> 0:19:17.66 That you're also inhaling.

0:19:17.66 -> 0:19:22.451 So there is a plethora of things you're being exposed to now.

0:19:22.451 -> 0:19:27.708 Do we have clear cut evidence that all these are leading to cancer?

0:19:27.708 -> 0:19:29.949 No, we don't have it as yet.

0:19:29.949 -> 0:19:44.093 There is a lot of emerging evidence that suggests that exposure in cellular models or in preclinical models leads to DNA damage which could potentially cause bladder cancer,

0:19:44.093 -> 0:19:47.492 or lung cancer in animal models,

0:19:47.492 -> 0:19:57.088 But we have not. I would say unfortunately, had the time frame of exposure in human to really see this emerge, it may take 10 or 20 years before

0:19:57.088 -> 0:19:59.98 we see that like it did with cigarettes,

0:19:59.98 -> 0:20:06.076 it took a long time with cigarettes for us to start linking cigarette use to lung cancer rates.

0:20:06.076 -> 0:20:13.807 But there is a very clear evidence that lung cancer rates parallel cigarette use rates and lagged by about 10 or 12 years.

0:20:13.807 -> 0:20:19.839 So there's a natural experiment going on here which is concerning and it's also concerning that

0:20:19.839 -> 0:20:24.082 a majority of the use of these product seems to be by youth,

0:20:24.082 -> 0:20:27.627 right? What interventions have you found,

0:20:27.627 -> 0:20:34.095 if any? Are you working to either help stop using or even preferably not start using?

0:20:34.095 -> 0:20:45.152 I would say unfortunately the interventional area has lagged even further behind than the other science because developing interventions takes time.

0:20:45.152 -> 0:20:50 Developing interventions takes understanding of the behavior so you can

0:20:50 -> 0:20:57.453 develop appropriate interventions to know whether you have to treat withdrawal symptoms of the medication,

0:20:57.453 -> 0:21:00.474 or behavioral intervention will suffice.

0:21:00.474 -> 0:21:02.21 You know things like that.

0:21:02.21 -> 0:21:10.178 That said, the FDA has had a lot of prevention programs in place where they're really trying to educate people through ads.

0:21:10.178 -> 0:21:13.262 Enter prevention programs about these products.

0:21:13.262 -> 0:21:17.567 We here in Connecticut are doing a lot of work with local schools.

0:21:17.567 -> 0:21:20.009 I think my group has probably visited

0:21:20.009 -> 0:21:22.97 40 to 50 local schools just in the past year.

0:21:22.97 -> 0:21:30.564 Talking to students and teachers and explaining to them and making them understand that this is not just water vapor,

0:21:30.564 -> 0:21:32.558 which is what most kids think.

0:21:32.558 -> 0:21:34.94 They think this is just water vapor.

0:21:34.94 -> 0:21:36.676 It's not going to harm me.

0:21:36.676 -> 0:21:40.087 It's not producing any combustion products or smoke,

0:21:40.087 -> 0:21:42.339 so why should it be of harm to me?

0:21:42.339 -> 0:21:53.279 So I think education is the first step, we need to make parents and children and everybody understand that you don't just start using these products because they are there.

0:21:53.279 -> 0:21:58.905 The second thing we really need to do is regulate the product's well.

0:21:58.905 -> 0:22:01.334 The product's have not

0:22:01.334 -> 0:22:04.471 unfortunately been regulated.

0:22:04.471 -> 0:22:13.532 I would be all for a marketplace where products like these are made available to smokers who might want to use them to quit smoking but are sold in

0:22:13.532 -> 0:22:23.599 such a way that they are not available to youth who may want to initiate use of these products from an actual interventional perspective via just starting down that path

0:22:23.599 -> 0:22:31.394 where we are. There has been some huge initiatives that have come out from a variety of organizations,

0:22:31.394 -> 0:22:40.579 and the NIH is also starting to organize conferences on this issue to try to identify the holes and where money needs to be put.

0:22:40.579 -> 0:22:45.88 We're just starting down that path of developing interventions for E cigarettes,

0:22:45.88 -> 0:22:56.674 but I think most of these would probably draw some principles or ideas from what has been done for smoking cessation and things that work for smoking cessation as

0:22:56.674 -> 0:23:00.011 there's a wide variety of things that have worked.

0:23:00.011 -> 0:23:04.002 Behavioral interventions like calling to behavioral therapy,

0:23:04.002 -> 0:23:12.957 motivational interventions. The nicotine Patch and gum and of course things like Chantix and zyban have also worked in adults.

0:23:12.957 -> 0:23:22.759 Unfortunately most of these interventions I talked about have worked primarily for adults and they have not worked very well for kids,

0:23:22.759 -> 0:23:31.035 so we still have this huge hole where we need to do a lot more work to develop interventions for you then we are.

0:23:31.035 -> 0:23:35.463 My group is starting down that path but we're not there yet.

0:23:35.463 -> 0:23:39.132 It seems like. I'm certainly not deep in this field at all,

0:23:39.132 -> 0:23:43.728 but it seems like at some point in the last 20 years smoking became not cool.

0:23:43.728 -> 0:23:45.496 Yes, it became kind of gross.

0:23:45.496 -> 0:23:54.689 It was excluded from bars and restaurants and there were all these ads about what smokers look like and it was disgusting and I have to imagine the kids

0:23:54.689 -> 0:23:58.282 don't want to look like that person,

0:23:58.282 -> 0:24:01.936 right? Yeah that ad they used with this guy,

0:24:01.936 -> 0:24:04.294 he was really decrepit. And awful right?

0:24:04.294 -> 0:24:08.89 But right now what you're saying is these devices are seen as cool and that's

0:24:08.89 -> 0:24:10.788 the big problem I would think.

0:24:10.788 -> 0:24:18.683 Yeah, there's an essential problem here in that we don't have the signs that tell us what these devices actually do to you.

0:24:18.683 -> 0:24:22.48 One of the things that I have learned over many years of working with kids,

0:24:22.48 -> 0:24:29.027 is you do not just go in and tell them this device is going to cause cancer because especially in this day and age of social media,

0:24:29.027 -> 0:24:32.125 they'll open up an app and they'll tell you it does not.

0:24:32.125 -> 0:24:33.824 There's no evidence it does this,

0:24:33.824 -> 0:24:36.821 so I think we have to be very careful how we approach this.

0:24:36.821 -> 0:24:39.339 I'm glad you brought up the issue about cigarette.

0:24:39.339 -> 0:24:42.44 And how it kind of became a non cigarette culture.

0:24:42.44 -> 0:24:46.451 Overtime this was because of all the regulatory work that we did.

0:24:46.451 -> 0:24:53.928 All the education we did over a number of years which basically made people realize that they did not want to be a smoker.

0:24:53.928 -> 0:25:00.31 And you know, there was a whole change in culture in terms of whether you want to be a smoker or not,

0:25:00.31 -> 0:25:04.566 and being a smoker was not considered cool anymore and with these devices

0:25:04.566 -> 0:25:06.388 we need to go down that path.

0:25:06.388 -> 0:25:09.64 I'm hoping it doesn't take us 10 years to get there.

0:25:09.64 -> 0:25:13.895 Because at this point I cannot take that man,
0:25:13.895 -> 0:25:19.2 you know, with a hole in their throat or the woman
with a heart problem and say,
0:25:19.2 -> 0:25:21.098 hey, if you use this device,
0:25:21.098 -> 0:25:27.253 this is what's going to happen to you because I don't
have the signs supporting that message.
0:25:27.253 -> 0:25:31.968 So we have to base it on evidence that we know from
preclinical models,
0:25:31.968 -> 0:25:38.319 especially for nicotine. And there is so much evidence
of the damage that nicotine can do,
0:25:38.319 -> 0:25:41.789 after long term exposure from a lot of animal models.
0:25:41.789 -> 0:25:45.271 Nicotine, especially in the adolescent brain,
0:25:45.271 -> 0:25:49.934 the brain is not only known to be highly sensitive to
the effects of nicotine,
0:25:49.934 -> 0:25:52.547 which means you get addicted more easily
0:25:52.547 -> 0:25:55.406 but nicotine is also a neurotoxin in adolescence,
0:25:55.406 -> 0:25:58.577 so it can cause cognitive changes it can.
0:25:58.577 -> 0:26:01.5 It has been shown to cause epigenetic changes,
0:26:01.5 -> 0:26:06.972 especially in genes that are involved in things like
asthma and anxiety and depression.
0:26:06.972 -> 0:26:12.38 So there is a lot of evidence that we have from animal
data that we need to find a way
0:26:12.38 -> 0:26:17.52 of transforming that into public messages and convey-
ing that to youth and parents,
0:26:17.52 -> 0:26:21.298 it's very difficult to motivate kids to quit using any-
thing.
0:26:21.298 -> 0:26:24.458 And we have a very tough battle on our hands here.
0:26:24.458 -> 0:26:26.067 Yeah, I just think about,
0:26:26.067 -> 0:26:28.792 you know the long history of marijuana use,
0:26:28.792 -> 0:26:33.315 and certainly nobody ever thought that was good
for adolescent brains.
0:26:33.315 -> 0:26:35.791 But that probably isn't enough to know,
0:26:35.791 -> 0:26:37.96 especially convince your peers. Saying,
0:26:37.96 -> 0:26:40.066 it's no big deal, blah blah blah.

0:26:40.066 -> 0:26:41.923 Who are going to believe right?

0:26:41.923 -> 0:26:44.029 And on that note, I will say that

0:26:44.029 -> 0:26:48.622 a lot of people are also using these devices for administering marijuana.

0:26:48.622 -> 0:26:50.422 In fact,

0:26:50.422 -> 0:26:52.594 if you've heard about it recently,

0:26:52.594 -> 0:27:03.205 the lung inflammatory conditions that were being observed and the deaths that we've had ,very unfortunate deaths we've had in the US over the past year have been related to

0:27:03.205 -> 0:27:07.488 black market use of these devices is what the CDC is telling us now,

0:27:07.488 -> 0:27:16.299 and potentially could be related to the use of things like marijuana and other compounds that might be in the solution like vitamin E acetate.

0:27:16.299 -> 0:27:26.929 I don't quite understand how vitamin E acetate and I've had conversations about this with a lot of my chemistry friends and trying to understand why it would cause the

0:27:26.929 -> 0:27:29.46 kind of damage that they are observing,

0:27:29.46 -> 0:27:37.811 but that seems to be the culprit that has been found in many E liquids that are associated with these lung inflammatory conditions.

0:27:37.811 -> 0:27:44.582 So I think the other message to really get out there is tell people don't change these devices,

0:27:44.582 -> 0:27:46.542 use them if you're using them,

0:27:46.542 -> 0:27:49.4 use them as they are available on the market.

0:27:49.4 -> 0:27:53.163 Because at least there is some control over what goes into them,

0:27:53.163 -> 0:27:56.288 even though they're not technically regulated as yet.

0:27:56.288 -> 0:28:03.526 The companies have a certain degree of responsibility to try to make sure that they have good products that go in there,

0:28:03.526 -> 0:28:05.667 but don't use black market products.

0:28:05.667 -> 0:28:09.663 And does the black market include those vape shops you see everywhere,

0:28:09.663 -> 0:28:10.878 or is that safer?

0:28:10.878 -> 0:28:13.193 The vape shops are not black market

0:28:13.193 -> 0:28:15.451 The vape shops actually have licenses,

0:28:15.451 -> 0:28:19.272 their local businesses that have licenses to sell these products,

0:28:19.272 -> 0:28:23.835 You can walk into a vape shop if you're 21 and older.

0:28:27.26 -> 0:28:29.38 You can try out different vaping,

0:28:29.38 -> 0:28:31.808 liquid's it's almost like as I say it

0:28:31.808 -> 0:28:40.53 walking into an Apple store where you can walk in and you can try out what what liquids you like and what you might want.

0:28:40.53 -> 0:28:42.898 You might like to use so they're not

0:28:42.898 -> 0:28:51.23 technically illegal.

0:28:51.23 -> 0:29:00.586 If you have questions, the address is canceranswers@yale.edu and past editions of the program are available in audio and written form at Yalecancercenter.org.

0:29:00.586 -> 0:29:07.68 We hope you'll join us next week to learn more about the fight against cancer here on Connecticut public radio.