

WEBVTT

1 00:00:00.000 --> 00:00:03.833 Support for Yale Cancer Answers comes from AstraZeneca,

2 00:00:03.833 --> 00:00:09.037 now offering three FDA approved therapies for different forms of lung cancer.

3 00:00:09.037 --> 00:00:10.837 With more in the pipeline.

4 00:00:10.837 --> 00:00:13.506 When it comes to lung cancer treatment,

5 00:00:13.506 --> 00:00:15.307 one size does not fit all.

6 00:00:15.307 --> 00:00:18.660 Learn more at astrazeneca-us.com.

7 00:00:18.660 --> 00:00:23.385 Welcome to Yale Cancer Answers with doctors Anees Chagpar and Steven Gore,

8 00:00:23.385 --> 00:00:33.536 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

9 00:00:33.536 --> 00:00:39.136 it's a conversation about E cigarettes, vaping and cancer risk with Doctor Suchitra Krishnan-Sarin

10 00:00:39.136 --> 00:00:43.920 Doctor Suchitra Krishnan-Sarin is a professor of psychiatry at the Yale School of Medicine.

11 00:00:43.920 --> 00:00:52.479 Dr Gore is a professor of internal Medicine in hematology at Yale and director of hematologic malignancies at Yale Cancer Center.

12 00:00:52.479 --> 00:01:02.270 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.

13 00:01:02.270 --> 00:01:06.608 Yeah, vaping has evolved or E cigarette users evolved over the years,

14 00:01:06.608 --> 00:01:15.531 and it's unfortunate that we had all these crises and especially young people who experienced a lot of lung damage and inflammatory conditions,

15 00:01:15.531 --> 00:01:18.194 and it's rather unfortunate. But you know,

16 00:01:18.194 --> 00:01:19.992 there are multiple devices

17 00:01:19.992 --> 00:01:26.561 on the market and they were generated with with a good cause in mind.

18 00:01:26.561 --> 00:01:28.144 And unfortunately

19 00:01:28.144 --> 00:01:31.683 they have taken on a life of their own.

20 00:01:31.683 --> 00:01:37.451 Do you think that the original motivation was to be able to wean people off cigarettes?

21 00:01:37.451 --> 00:01:49.837 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

22 00:01:49.837 --> 00:01:54.426 addiction. As most people who are in the cancer field know very well,

23 00:01:54.426 --> 00:01:58.700 tobacco, combustible cigarette smoke is one of the worst

24 00:01:58.700 --> 00:02:03.474 well known causes of cancer and a variety of other inflammatory conditions.

25 00:02:03.474 --> 00:02:09.883 So there has always been the hope that we would be able to get smokers to quit using their cigarettes.

26 00:02:09.883 --> 00:02:13.590 That has not always played out the way that we like it to.

27 00:02:13.590 --> 00:02:20.752 A lot of smokers still smoke despite having multiple health problems, despite knowing the health risks of smoking.

28 00:02:20.752 --> 00:02:26.532 So the idea here was that perhaps if you have a cleaner form of nicotine available to them,

29 00:02:26.532 --> 00:02:32.770 the underlying thought being that nicotine is the addictive substance in cigarettes and

30 00:02:32.770 --> 00:02:34.103 if you can replace

31 00:02:34.103 --> 00:02:36.769 that addiction with something else

32 00:02:36.769 --> 00:02:40.889 then perhaps smokers will be able to quit this combustible product,

33 00:02:40.889 --> 00:02:43.919 which is of course fraught with so many problems.

34 00:02:43.919 --> 00:02:50.949 And as you know, as everybody's heard, it has 4000 chemicals and causes combustion and has a variety of respiratory

35 00:02:50.949 --> 00:03:00.038 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,

36 00:03:00.038 --> 00:03:04.159 also called harm reduction, is not an idea that we should throw out.

37 00:03:04.159 --> 00:03:11.610 And yet, the success with either nicotine patches or nicotine gum, which are those that come to mind has not been terrific,

38 00:03:11.610 --> 00:03:16.151 right? Or not that many people are successful using patches or gum.

39 00:03:16.151 --> 00:03:18.187 Some people are. Yeah, absolutely.

40 00:03:18.187 --> 00:03:21.039 So there are a couple of problems with patches and gum.

41 00:03:21.039 --> 00:03:26.278 The main problem is that they do not deliver nicotine the same way that a cigarette does.

42 00:03:26.278 --> 00:03:34.379 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

43 00:03:34.379 --> 00:03:39.294 combust the product and you get an elevation in blood nicotine levels in your body.

44 00:03:39.294 --> 00:03:49.360 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

45 00:03:49.360 --> 00:03:55.855 and their withdrawal symptoms. There are there have been studies which have shown that if you combine the two,

46 00:03:55.855 --> 00:03:59.425 for example, if you combine nicotine Patch and gum together,

47 00:03:59.425 --> 00:04:05.569 you have better outcomes because essentially what you're doing is you're boosting up that nicotine level.

48 00:04:05.569 --> 00:04:10.144 So there are ways of manipulating the existing products to make them work,

49 00:04:10.144 --> 00:04:16.060 but people are always on the lookout for something new that could be even more helpful now.

50 00:04:16.060 --> 00:04:20.086 Is there a difference between an E cigarette and Vaping?

51 00:04:20.086 --> 00:04:21.550 Are they just the same?

52 00:04:21.550 --> 00:04:23.197 It's a very good question.

53 00:04:23.197 --> 00:04:25.331 No, they are essentially the same.

54 00:04:25.331 --> 00:04:26.978 E cigarette is the device,

55 00:04:26.978 --> 00:04:30.149 vaping is the behavior that said people are vaping,

56 00:04:30.149 --> 00:04:36.310 you can vape whatever you put in the E cigarette device so they were originally created for nicotine.

57 00:04:36.310 --> 00:04:38.562 You can get them with nicotine.

58 00:04:38.562 --> 00:04:41.028 You can get them without nicotine.

59 00:04:41.028 --> 00:04:45.463 You can get them with a variety of flavors or without flavors.

60 00:04:45.463 --> 00:04:56.026 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,

61 00:04:56.026 --> 00:05:03.560 which in in a sense I feel is what the CDC is saying has led to the current crisis that we have right now.

62 00:05:03.560 --> 00:05:08.629 This so called black market or manipulative values of these devices now.

63 00:05:08.629 --> 00:05:12.749 The E cigarettes that one can purchase in some drug stores,

64 00:05:12.749 --> 00:05:17.358 for example. Can those be refilled with stuff from Vaping stores,

65 00:05:17.358 --> 00:05:19.732 or is it a separate device?

67 00:05:21.687 --> 00:05:27.831 There are a variety of devices on the market and each one of them can be manipulated.

68 00:05:31.740 --> 00:05:36.069 We started out with a device which was very rudimentary,

71 00:05:36.069 --> 00:05:40.050 which really did not even deliver nicotine that well.

72 00:05:40.050 --> 00:05:44.497 It was called a cigalike when it initially came out, the nicotine solution.

73 00:05:44.497 --> 00:05:48.887 And the device was not formulated very well,

74 00:05:48.887 --> 00:05:52.682 so people didn't really get enough nicotine from these devices.

75 00:05:52.682 --> 00:05:55.884 Overtime these formulations have become a lot better,

76 00:05:55.884 --> 00:06:01.401 so you have these closed systems which look almost like a cigarette and are called Cigalikes.

77 00:06:01.401 --> 00:06:05.314 Then they evolved into a variety of other systems.

78 00:06:05.314 --> 00:06:10.060 You have things called tanks which are refillable clear tanks that you can fill

79 00:06:10.060 --> 00:06:12.461 with any liquid that's on the market,

80 00:06:12.461 --> 00:06:14.201 you have things called mods,

81 00:06:14.201 --> 00:06:17.322 which are basically if you've seen people use them,

82 00:06:17.322 --> 00:06:20.264 these don't even look like cigarettes.

83 00:06:20.264 --> 00:06:23.745 It's a rectangular box like jewel thing.

87 00:06:32.747 --> 00:06:36.949 It's called box mods and you can put a variety of attachments onto them

88 00:06:36.949 --> 00:06:38.461 to make the vapor better,

89 00:06:38.461 --> 00:06:40.613 you know you can produce more vapor.

90 00:06:40.613 --> 00:06:43.290 You can change the resistance of the devices.

91 00:06:43.290 --> 00:06:52.072 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

92 00:06:52.072 --> 00:07:00.855 them for shows. You know there are competitions that you can participate in, vape competitions for creating the smoke rings and smell.

93 00:07:00.855 --> 00:07:02.949 You're going back to school pranks,

94 00:07:02.949 --> 00:07:07.019 but you know they can do a lot fancier things with these devices.

95 00:07:07.019 --> 00:07:12.574 And now the newer generation device is the one that you probably heard the most about,

96 00:07:12.574 --> 00:07:14.593 which are the pod like devices.

97 00:07:14.593 --> 00:07:16.362 These are the jewel device,

98 00:07:16.362 --> 00:07:21.473 the jewel devices, the way they vary from the other devices is in multiple aspects.

99 00:07:21.473 --> 00:07:26.398 First they are very small and they are discrete so they can be easily hidden.

100 00:07:26.398 --> 00:07:31.762 The jewel is a closed system which means you cannot technically manipulate it.

101 00:07:31.762 --> 00:07:34.413 It comes with nicotine and it comes,

102 00:07:34.413 --> 00:07:37.569 with a variety of flavors,

103 00:07:37.569 --> 00:07:40.689 but now those have been taken off the market.

104 00:07:40.689 --> 00:07:47.927 The jewel also differs from the earlier devices because they use a nicotine salt in the device.

105 00:07:47.927 --> 00:07:55.598 It's called benzoic acid salt and this causes faster absorption and a faster peak blood.

106 00:07:55.598 --> 00:08:06.019 Nicotine level as opposed to freebase nicotine which is what is in all the other nicotine liquids that exist in the market now.

107 00:08:06.019 --> 00:08:08.624 Freebase, nicotine and salt differ.

108 00:08:08.624 --> 00:08:11.809 As I said most cigarettes contain freebase,

109 00:08:11.809 --> 00:08:16.040 nicotine

110 00:08:16.040 --> 00:08:18.358 which increase blood levels a lot faster.

111 00:08:18.358 --> 00:08:21.255 They are also supposed to be more palatable.

112 00:08:21.255 --> 00:08:22.930 Now this is what is said.

113 00:08:22.930 --> 00:08:25.119 I have not seen evidence of this,

114 00:08:25.119 --> 00:08:35.933 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.

115 00:08:35.933 --> 00:08:40.698 It stings right, it stings in the back of your throat or makes you cough.

116 00:08:40.698 --> 00:08:42.820 Or you know just tastes better.

117 00:08:42.820 --> 00:08:50.308 Jewe like devices. Just to follow up and answer the question you asked earlier.

118 00:08:50.308 --> 00:08:59.580 As I said, the market has evolved to now where there are jewel knock off pods where you can actually buy

119 00:08:59.580 --> 00:09:10.240 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

120 00:09:10.240 --> 00:09:12.451 dualan come in multiple flavors.

121 00:09:12.451 --> 00:09:19.692 So I think the problem with this market is in the quest to come up with the product that works for smokers,

122 00:09:19.692 --> 00:09:26.264 with the idea being that it needs to produce the maximum nicotine level it needs to be palatable.

123 00:09:26.264 --> 00:09:29.548 It needs to satisfy the smokers we have created.

124 00:09:29.548 --> 00:09:31.559 This market that is producing.

125 00:09:31.559 --> 00:09:36.875 all these devices, which unfortunately are also very attractive to youth,

126 00:09:36.875 --> 00:09:43.412 which is what has led to the huge youth epidemic that we have with the current CDC number.

127 00:09:43.412 --> 00:09:50.524 Saying that almost 27.5% of high school youth are using these devices regularly in the past month.

128 00:09:50.524 --> 00:09:53.182 Those are the numbers.

129 00:09:53.182 --> 00:09:55.768 So there are all these kids

130 00:09:55.768 --> 00:10:01.730 who have used these devices in the past month and

131 00:10:01.730 --> 00:10:04.089 I'm sure that not all 27.5%

132 00:10:04.089 --> 00:10:06.820 have used them every day in the past month,

133 00:10:06.820 --> 00:10:08.682 but a significant number did.

134 00:10:08.682 --> 00:10:15.138 And how does that compare to what cigarette users used to be like in that population say 20 years ago?

135 00:10:15.138 --> 00:10:24.448 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.

136 00:10:24.448 --> 00:10:28.606 The reason being that a cigarette is a combustible product.

137 00:10:28.606 --> 00:10:32.580 You light it and then you have to use it up before it burns out.

138 00:10:32.580 --> 00:10:35.475 With these devices you have the option of charging it,

139 00:10:35.475 --> 00:10:40.215 taking a puff and then putting it back in your pocket and then using it whenever you want,

140 00:10:40.215 --> 00:10:43.847 so it's not like it runs out at the same rate that a cigarette does,

141 00:10:43.847 --> 00:10:51.429 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

142 00:10:51.429 --> 00:10:53.642 equate them to cigarettes. At this point,

143 00:10:53.642 --> 00:11:00.222 the only thing I can really think of is looking at things like nicotine and cotinine levels which exist in both,

144 00:11:00.222 --> 00:11:01.644 so it's a different beast.

145 00:11:01.644 --> 00:11:03.419 I would say that cigarettes are.

146 00:11:03.419 --> 00:11:11.792 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.

147 00:11:11.792 --> 00:11:16.585 And my area of research is really an understanding of youth substance.

148 00:11:16.585 --> 00:11:20.163 Youth risk behaviors and developing interventions for it.

149 00:11:20.163 --> 00:11:23.678 So I have worked with a lot of substances in the past,

150 00:11:23.678 --> 00:11:34.990 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

151 00:11:34.990 --> 00:11:36.990 few years. So what is the appeal?

152 00:11:36.990 --> 00:11:38.590 Is it that they seem cool?

153 00:11:38.590 --> 00:11:40.601 I mean, I understand the flavors,

154 00:11:40.601 --> 00:11:46.166 but you know, kids can get flavors from chewing gum and all sorts of candy and other garbage,

155 00:11:46.166 --> 00:11:48.120 So we've been

156 00:11:48.120 --> 00:11:51.494 looking into this quite a bit in our work.

157 00:11:51.494 --> 00:11:52.855 And we still need to

158 00:11:52.855 --> 00:11:55.577 understand the full picture,

159 00:11:55.577 --> 00:11:57.768 but here's what I think is going on.

160 00:11:57.768 --> 00:12:00.668 First of all, you get multiple kinds of devices,

161 00:12:00.668 --> 00:12:02.562 right? So it's very innovative.

162 00:12:02.562 --> 00:12:05.167 You can do smoke tricks with these devices,

163 00:12:05.167 --> 00:12:07.179 or vape tricks with these devices.

164 00:12:07.179 --> 00:12:09.994 That's another innovative aspect of things.

165 00:12:09.994 --> 00:12:12.360 Kids who are that in that age range,

166 00:12:12.360 --> 00:12:22.019 teenagers are really looking for things that they can make their own and yet give them this innovative aspect of it

167 00:12:22.019 --> 00:12:24.066 There always being told,

168 00:12:24.066 --> 00:12:26.113 don't do this or don't do that.

169 00:12:26.113 --> 00:12:30.590 Here is something that they can manipulate to kind of make their own.

170 00:12:30.590 --> 00:12:34.940 They can choose from anywhere between 7 and 15,000 flavors.

171 00:12:34.940 --> 00:12:38.440 There's an amazing range of flavors out there.

172 00:12:38.440 --> 00:12:42.144 They can choose to use it with or without nicotine.

173 00:12:42.144 --> 00:12:45.919 They can choose to put marijuana in it if they want,

174 00:12:45.919 --> 00:12:47.842 or they can choose to add things

175 00:12:47.842 --> 00:12:51.048 or use it with other things,

176 00:12:51.048 --> 00:12:58.386 so I think the innovative aspect of these devices is really what draws kids to these products.

177 00:12:58.386 --> 00:13:00.096 The flavors are a huge,

178 00:13:00.096 --> 00:13:05.082 appealing aspect of it. We have asked many about this over the years.

179 00:13:05.082 --> 00:13:08.929 We conduct longitudinal surveys in schools in Indiana

180 00:13:08.929 --> 00:13:15.576 and the New Haven County and flavors are one of the top reasons why kids like these devices,

181 00:13:15.576 --> 00:13:18.006 like using them. They taste good.

182 00:13:18.006 --> 00:13:21.009 The other aspect, which they really like,

183 00:13:21.009 --> 00:13:23.868 is the fact that they're very discreet.

184 00:13:23.868 --> 00:13:27.514 One of the things we hear a lot from,

185 00:13:27.514 --> 00:13:31.873 teachers in schools, and we do a lot of work in schools too,

186 00:13:31.873 --> 00:13:34.089 is that they're easily hidden.

187 00:13:34.089 --> 00:13:40.307 Believe it or not, there are actually sweat shirts you can buy with holes

188 00:13:40.307 --> 00:13:41.879 where you can hide

189 00:13:41.879 --> 00:13:48.679 a jewel and so in class you can take a quick puff from it if you need to.

190 00:13:48.679 --> 00:13:52.494 And they don't produce as much smoke as cigarettes.

191 00:13:52.494 --> 00:13:54.557 So again, they're very discreet.

192 00:13:54.557 --> 00:13:59.623 All these together make it a perfect storm for youth.

193 00:13:59.623 --> 00:14:03.562 Wow, this is a very fascinating and important topic, but right now

194 00:14:03.562 --> 00:14:14.755 we've got to take a short break for a medical minute. Support for Yale Cancer Answers comes from AstraZeneca, committed to pioneering the next generation of innovative lung cancer

195 00:14:14.755 --> 00:14:19.330 treatments. Learn more at astrazeneca-us.com.

196 00:14:19.330 --> 00:14:27.879 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.

197 00:14:27.879 --> 00:14:37.323 Patients that are considered at risk receive genetic counseling and testing so informed medical decisions can be based on their own personal risk assessment.

198 00:14:37.323 --> 00:14:44.078 Resources for genetic counseling and testing are available at federally designated comprehensive cancer centers.

199 00:14:44.078 --> 00:14:47.965 Interdisciplinary teams include geneticists, genetic counselors,

200 00:14:47.965 --> 00:14:55.089 physicians, and nurses who work together to provide risk assessment and steps to prevent the development of cancer.

201 00:14:55.089 --> 00:14:58.482 More information is available at yalecancer-center.org.

202 00:14:58.482 --> 00:15:02.120 You're listening to Connecticut public radio.

203 00:15:02.120 --> 00:15:04.535 Welcome back to Yale Cancer Answers.

204 00:15:04.535 --> 00:15:06.428 This is doctor Steven Gore.

205 00:15:06.428 --> 00:15:09.889 I'm joined tonight by my guest doctor Krishnan-Sarin.

206 00:15:09.889 --> 00:15:14.590 We've been discussing vaping, particularly among adolescents and youth,

207 00:15:14.590 --> 00:15:16.548 so it was really fascinating.

208 00:15:16.548 --> 00:15:18.442 But before the break,

209 00:15:18.442 --> 00:15:25.557 when you were telling me that how much flavor really is drawing the youth and this whole idea of discretion,

210 00:15:25.557 --> 00:15:33.850 I can certainly imagine the idea that you're getting away with something, and in the place where I get my haircut

211 00:15:33.850 --> 00:15:42.100 I think most of the stylists vape and they mostly use jewel and

212 00:15:42.100 --> 00:15:45.597 the person who cuts my hair is trying to get off of it

213 00:15:45.597 --> 00:15:50.407 but sometimes it is kind of hard to know whether he just took a drag or not.

214 00:15:50.407 --> 00:15:53.404 He isn't hiding it, but I mean it's so discreet.

215 00:15:53.404 --> 00:16:02.961 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

216 00:16:02.961 --> 00:16:07.207 there's smoke, it's irritating in the back of your throat.

217 00:16:07.207 --> 00:16:12.080 Things like that you don't have those cues here which are telling you OK stop.

218 00:16:12.080 --> 00:16:15.190 You know, maybe you shouldn't be doing this,

219 00:16:15.190 --> 00:16:24.241 and I say kudos to all the smokers who have quit cigarettes and who have quit using these products.

220 00:16:24.241 --> 00:16:29.078 If if they have quit and this product has been helpful to help them quit,

221 00:16:29.078 --> 00:16:32.216 that's wonderful and I think that's a great tool,

222 00:16:32.216 --> 00:16:38.732 but I would also add that this should not be an addiction that they should maintain for the rest of their life.

223 00:16:38.732 --> 00:16:41.293 We have studied for many years

224 00:16:41.293 --> 00:16:43.445 cigarette addiction.

225 00:16:43.445 --> 00:16:53.335 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

226 00:16:53.335 --> 00:16:56.418 be dependent on nicotine for the rest of their life.

227 00:16:56.418 --> 00:17:02.769 And you know, I think we all know that nicotine is an essential receptor on the human body and is involved in

228 00:17:02.769 --> 00:17:07.699 almost every bodily function the nicotinic acetylcholine receptors are everywhere.

229 00:17:07.699 --> 00:17:09.497 And if you are using nicotine,

230 00:17:09.497 --> 00:17:14.599 you're basically altering any systems that are related to the presence of this receptor.

231 00:17:14.599 --> 00:17:21.068 Is there anything known about the long-term health risk

232 00:17:21.068 --> 00:17:24.439 even if it didn't have nicotine or anything else?

233 00:17:24.439 --> 00:17:26.528 I mean, does that harm the lungs?

234 00:17:26.528 --> 00:17:28.009 Do we know?

235 00:17:28.009 --> 00:17:32.323 I mentioned earlier that there was exponential rise.

236 00:17:32.323 --> 00:17:38.85 and the science has not kept up with the marketing and the rise in the use of these products.

237 00:17:38.859 --> 00:17:45.059 So we're learning every day about what these products can do or what harm they can do or not.

238 00:17:45.059 --> 00:17:50.769 I will tell you that the products contain substances like propylene glycol and glycerin,

239 00:17:50.769 --> 00:17:53.340 which are used as solvents in the product.

240 00:17:53.340 --> 00:17:55.223 Some of them contain ethanol.

241 00:17:55.223 --> 00:18:03.317 You know these are all solvents that are used to dissolve the nicotine and or the various flavor chemicals that are put in there.

242 00:18:03.317 --> 00:18:05.386 The problem with glycol and glycerin,

243 00:18:05.386 --> 00:18:09.842 we're learning that they can have inflammatory reactions of their own,

244 00:18:09.842 --> 00:18:20.835 but they also, it appears create additional compounds when they're just sitting in there in the E liquid

245 00:18:20.835 --> 00:18:26.635 called acetals, and these acetals are also known to have inflammatory potential.

246 00:18:26.635 --> 00:18:28.590 I see now in addition to that,

247 00:18:28.590 --> 00:18:31.617 the flavor chemicals themselves are not benign,

248 00:18:31.617 --> 00:18:36.031 they're chemicals. They are things like benzaldehyde.

249 00:18:36.031 --> 00:18:39.941 You know all these things you find in your chemistry lab.

250 00:18:39.941 --> 00:18:44.069 Yeah exactly, and for those who don't know about diacetyl.

251 00:18:44.069 --> 00:18:53.384 Diacetyl is also what was in buttered popcorn flavor and it was found many years ago to be associated with bronchiolitis obliterans,

252 00:18:53.384 --> 00:18:55.180 which is a

253 00:18:55.180 --> 00:19:00.968 inflammatory condition, and so these flavor chemicals are not benign as of themselves.

254 00:19:00.968 --> 00:19:09.151 You know, they can have potentially inflammatory effects on the human body and the vape also contains

255 00:19:09.151 --> 00:19:15.204 metal particles which are generated from the battery or the heating element.

256 00:19:15.204 --> 00:19:17.660 That you're also inhaling.

257 00:19:17.660 --> 00:19:22.451 So there is a plethora of things you're being exposed to now.

258 00:19:22.451 --> 00:19:27.708 Do we have clear cut evidence that all these are leading to cancer?

259 00:19:27.708 --> 00:19:29.949 No, we don't have it as yet.

260 00:19:29.949 --> 00:19:44.093 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,

261 00:19:44.093 --> 00:19:47.492 or lung cancer in animal models,

262 00:19:47.492 --> 00:19:57.088 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

263 00:19:57.088 --> 00:19:59.980 we see that like it did with cigarettes,

264 00:19:59.980 --> 00:20:06.076 it took a long time with cigarettes for us to start linking cigarette use to lung cancer rates.

265 00:20:06.076 --> 00:20:13.807 But there is a very clear evidence that lung cancer rates parallel cigarette use rates and lagged by about 10 or 12 years.

266 00:20:13.807 --> 00:20:19.839 So there's a natural experiment going on here which is concerning and it's also concerning that

267 00:20:19.839 --> 00:20:24.082 a majority of the use of these product seems to be by youth,

268 00:20:24.082 --> 00:20:27.627 right? What interventions have you found,

269 00:20:27.627 --> 00:20:34.095 if any? Are you working to either help stop using or even preferably not start using?

270 00:20:34.095 --> 00:20:45.152 I would say unfortunately the interventional area has lagged even further behind than the other science because developing interventions takes time.

271 00:20:45.152 --> 00:20:50.000 Developing interventions takes understanding of the behavior so you can

272 00:20:50.000 --> 00:20:57.453 develop appropriate interventions to know whether you have to treat withdrawal symptoms of the medication,

273 00:20:57.453 --> 00:21:00.474 or behavioral intervention will suffice.

274 00:21:00.474 --> 00:21:02.210 You know things like that.

275 00:21:02.210 --> 00:21:10.178 That said, the FDA has had a lot of prevention programs in place where they're really trying to educate people through ads.

276 00:21:10.178 --> 00:21:13.262 Enter prevention programs about these products.

277 00:21:13.262 --> 00:21:17.567 We here in Connecticut are doing a lot of work with local schools.

278 00:21:17.567 --> 00:21:20.009 I think my group has probably visited

279 00:21:20.009 --> 00:21:22.970 40 to 50 local schools just in the past year.

280 00:21:22.970 --> 00:21:30.564 Talking to students and teachers and explaining to them and making them understand that this is not just water vapor,

281 00:21:30.564 --> 00:21:32.558 which is what most kids think.

282 00:21:32.558 --> 00:21:34.940 They think this is just water vapor.

283 00:21:34.940 --> 00:21:36.676 It's not going to harm me.

284 00:21:36.676 --> 00:21:40.087 It's not producing any combustion products or smoke,

285 00:21:40.087 --> 00:21:42.339 so why should it be of harm to me?

286 00:21:42.339 --> 00:21:53.279 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.

287 00:21:53.279 --> 00:21:58.905 The second thing we really need to do is regulate the product's well.

288 00:21:58.905 --> 00:22:01.334 The product's have not

289 00:22:01.334 --> 00:22:04.471 unfortunately been regulated.

290 00:22:04.471 --> 00:22:13.532 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

291 00:22:13.532 --> 00:22:23.599 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

292 00:22:23.599 --> 00:22:31.394 where we are. There has been some huge initiatives that have come out from a variety of organizations,

293 00:22:31.394 --> 00:22:40.579 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.

294 00:22:40.579 --> 00:22:45.880 We're just starting down that path of developing interventions for E cigarettes,

295 00:22:45.880 --> 00:22:56.674 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

296 00:22:56.674 --> 00:23:00.011 there's a wide variety of things that have worked.

297 00:23:00.011 --> 00:23:04.002 Behavioral interventions like calling to behavioral therapy,

298 00:23:04.002 --> 00:23:12.957 motivational interventions. The nicotine Patch and gum and of course things like Chantix and zyban have also worked in adults.

299 00:23:12.957 --> 00:23:22.759 Unfortunately most of these interventions I talked about have worked primarily for adults and they have not worked very well for kids,

300 00:23:22.759 --> 00:23:31.035 so we still have this huge hole where we need to do a lot more work to develop interventions for you then we are.

301 00:23:31.035 --> 00:23:35.463 My group is starting down that path but we're not there yet.

302 00:23:35.463 --> 00:23:39.132 It seems like. I'm certainly not deep in this field at all,

303 00:23:39.132 --> 00:23:43.728 but it seems like at some point in the last 20 years smoking became not cool.

304 00:23:43.728 --> 00:23:45.496 Yes, it became kind of gross.

305 00:23:45.496 --> 00:23:54.689 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

306 00:23:54.689 --> 00:23:58.282 don't want to look like that person,

307 00:23:58.282 --> 00:24:01.936 right? Yeah that ad they used with this guy,

308 00:24:01.936 --> 00:24:04.294 he was really decrepit. And awful right?

309 00:24:04.294 --> 00:24:08.890 But right now what you're saying is these devices are seen as cool and that's

310 00:24:08.890 --> 00:24:10.788 the big problem I would think.

311 00:24:10.788 --> 00:24:18.683 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.

312 00:24:18.683 --> 00:24:22.480 One of the things that I have learned over many years of working with kids,

313 00:24:22.480 --> 00:24:29.027 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,

314 00:24:29.027 --> 00:24:32.125 they'll open up an app and they'll tell you it does not.

315 00:24:32.125 --> 00:24:33.824 There's no evidence it does this,

316 00:24:33.824 --> 00:24:36.821 so I think we have to be very careful how we approach this.

317 00:24:36.821 --> 00:24:39.339 I'm glad you brought up the issue about cigarette.

318 00:24:39.339 --> 00:24:42.440 And how it kind of became a non cigarette culture.

319 00:24:42.440 --> 00:24:46.451 Overtime this was because of all the regulatory work that we did.

320 00:24:46.451 --> 00:24:53.928 All the education we did over a number of years which basically made people realize that they did not want to be a smoker.

321 00:24:53.928 --> 00:25:00.310 And you know, there was a whole change in culture in terms of whether you want to be a smoker or not,

322 00:25:00.310 --> 00:25:04.566 and being a smoker was not considered cool anymore and with these devices

323 00:25:04.566 --> 00:25:06.388 we need to go down that path.

324 00:25:06.388 --> 00:25:09.640 I'm hoping it doesn't take us 10 years to get there.

325 00:25:09.640 --> 00:25:13.895 Because at this point I cannot take that man,

326 00:25:13.895 --> 00:25:19.200 you know, with a hole in their throat or the woman with a heart problem and say,

327 00:25:19.200 --> 00:25:21.098 hey, if you use this device,

328 00:25:21.098 --> 00:25:27.253 this is what's going to happen to you because I don't have the signs supporting that message.

329 00:25:27.253 --> 00:25:31.968 So we have to base it on evidence that we know from preclinical models,

330 00:25:31.968 --> 00:25:38.319 especially for nicotine. And there is so much evidence of the damage that nicotine can do,

331 00:25:38.319 --> 00:25:41.789 after long term exposure from a lot of animal models.

332 00:25:41.789 --> 00:25:45.271 Nicotine, especially in the adolescent brain,

333 00:25:45.271 --> 00:25:49.934 the brain is not only known to be highly sensitive to the effects of nicotine,

334 00:25:49.934 --> 00:25:52.547 which means you get addicted more easily

335 00:25:52.547 --> 00:25:55.406 but nicotine is also a neurotoxin in adolescence,

336 00:25:55.406 --> 00:25:58.577 so it can cause cognitive changes it can.

337 00:25:58.577 --> 00:26:01.500 It has been shown to cause epigenetic changes,

338 00:26:01.500 --> 00:26:06.972 especially in genes that are involved in things like asthma and anxiety and depression.

339 00:26:06.972 --> 00:26:12.380 So there is a lot of evidence that we have from animal data that we need to find a way

340 00:26:12.380 --> 00:26:17.520 of transforming that into public messages and conveying that to youth and parents,

341 00:26:17.520 --> 00:26:21.298 it's very difficult to motivate kids to quit using anything.

342 00:26:21.298 --> 00:26:24.458 And we have a very tough battle on our hands here.

343 00:26:24.458 --> 00:26:26.067 Yeah, I just think about,

344 00:26:26.067 --> 00:26:28.792 you know the long history of marijuana use,

345 00:26:28.792 --> 00:26:33.315 and certainly nobody ever thought that was good for adolescent brains.

346 00:26:33.315 --> 00:26:35.791 But that probably isn't enough to know,

347 00:26:35.791 --> 00:26:37.960 especially convince your peers. Saying,

348 00:26:37.960 --> 00:26:40.066 it's no big deal, blah blah blah.

349 00:26:40.066 --> 00:26:41.923 Who are going to believe right?

350 00:26:41.923 --> 00:26:44.029 And on that note, I will say that

351 00:26:44.029 --> 00:26:48.622 a lot of people are also using these devices for administering marijuana.

352 00:26:48.622 --> 00:26:50.422 In fact,

353 00:26:50.422 --> 00:26:52.594 if you've heard about it recently,

354 00:26:52.594 --> 00:27:03.205 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

355 00:27:03.205 --> 00:27:07.488 black market use of these devices is what the CDC is telling us now,

356 00:27:07.488 --> 00:27:16.299 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.

357 00:27:16.299 --> 00:27:26.929 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

358 00:27:26.929 --> 00:27:29.460 kind of damage that they are observing,

359 00:27:29.460 --> 00:27:37.811 but that seems to be the culprit that has been found in many E liquids that are associated with these lung inflammatory conditions.

360 00:27:37.811 --> 00:27:44.582 So I think the other message to really get out there is tell people don't change these devices,

361 00:27:44.582 --> 00:27:46.542 use them if you're using them,

362 00:27:46.542 --> 00:27:49.400 use them as they are available on the market.

363 00:27:49.400 --> 00:27:53.163 Because at least there is some control over what goes into them,

364 00:27:53.163 --> 00:27:56.288 even though they're not technically regulated as yet.

365 00:27:56.288 --> 00:28:03.526 The companies have a certain degree of responsibility to try to make sure that they have good products that go in there,

366 00:28:03.526 --> 00:28:05.667 but don't use black market products.

367 00:28:05.667 --> 00:28:09.663 And does the black market include those vape shops you see everywhere,

368 00:28:09.663 --> 00:28:10.878 or is that safer?

369 00:28:10.878 --> 00:28:13.193 The vape shops are not black market

370 00:28:13.193 --> 00:28:15.451 The vape shops actually have licenses,

371 00:28:15.451 --> 00:28:19.272 their local businesses that have licenses to sell these products,

372 00:28:19.272 --> 00:28:23.835 You can walk into a vape shop if you're 21 and older.

374 00:28:27.260 --> 00:28:29.380 You can try out different vaping,

375 00:28:29.380 --> 00:28:31.808 liquid's it's almost like as I say it

376 00:28:31.808 --> 00:28:40.530 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.

377 00:28:40.530 --> 00:28:42.898 You might like to use so they're not

378 00:28:42.898 --> 00:28:51.230 technically illegal.

379 00:28:51.230 --> 00:29:00.586 If you have questions, the address is cancer-answers@yale.edu and past editions of the program are available in audio and written form at Yalecancercenter.org.

380 00:29:00.586 --> 00:29:07.680 We hope you'll join us next week to learn more about the fight against cancer here on Connecticut public radio.