

Tobacco Use Disorder - Avery

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This presentation is entitled Tobacco Use Disorder: Public Health and Practice. I will now turn it over to Dr. Jonathan Avery to begin our presentation.

 00:08

Hi everyone, I'm John Avery, I'm the chair of the review course again, as well as the vice chair for addiction psychiatry at Cornell, also the program director for our addiction psychiatry fellowship here, and I'm excited to talk about tobacco use disorder. It's titled Tobacco Use Disorder: Public Health and Practice, it probably should be called nicotine use disorder these days. We'll talk about cigarettes, of course, we'll also talk at the end about e-cigarettes and vaping and cover all things nicotine.

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And you know, I think historically, this was sort of a not as exciting a lecture after we had driven down the cigarette rates over all these years. And you know, we weren't dealing with it as much, but it's certainly front and center more than ever, with with the increase in vaping. So, a lot to learn. There's a lot of facts about tobacco use disorder that often show up on the exam. And so I'm excited to cover this and think about this topic with you all.

 01:17

Here I am- no relevant financial disclosures. So a little bit about the history. Before we dive into some of the clinical stuff. You know, nicotine has been around for a long time. Native American tribes cultivated and used it for many different purposes for 1000s of years, even before the Europeans came. And then it's been an important part of our economy and and, you know, certainly in the British American colonies and the early United States, and even today.

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The number of smokers have been driven down. But there's still a lot out there. The World Health Organization estimates that 1/3 of adults smoke. And because tobacco use is on the rise in

developing countries, decreasing here in the United States, which we'll talk about, but on the rise in other places, it still remains one of the few causes of death that is increasing. Nicotine and the reinforcing sensory stimulation associated with tobacco use are responsive for the compulsive use of tobacco, obviously, and comes in many forms you can see listed there. We'll talk about some of them in a minute.

 02:25

So as I said, you know, in the 50s, and 60s, if you were using nicotine, it was pretty much only evidence that you were alive. 42% of folks were using nicotine in 1965. And through all these public health efforts that we'll talk about in a second, we drove that number down to 14% in 2017. 2017, of course, is when started seeing that uptick in people vaping nicotine and juuling. And what we'll talk about that in a second. But incredible decrease over time, as we learned about all the harmful effects of tobacco use.

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Men, similar to other substances of abuse, are more likely to be smokers than women- about 15.8% versus 12.2%. And then many, of course, have smoking related health consequences. And it accounts for one in five of those with coronary artery disease.

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Physical tolls are incredible- leading cause of preventable death in United States- 440,000 premature deaths annually. Cardiovascular disease from cancer, from pulmonary disease, and the lost few years of life are tremendous, you know, 13 and 14 for men and women. So we know this, it certainly causes a lot of harm.

 03:47

One striking thing about who's smoking now, as I mentioned, in the 60s, if you were smoking, it was an indicator basically, of just being alive. But what we've noticed over the years is that those who have a hard time quitting and ending ending up with you know, nicotine, tobacco use disorders or those with co-occurring disorders. And in fact, very few people use nicotine still, without any mental health disorder. You know, it's associated with anxiety, mood symptoms, and then certainly other co-occurring substance, substance use disorders from problematic alcohol use to alcohol use disorder to a drug use disorder. And in fact, while nicotine wasn't predictive of anything in the 60s, it's predictive if you're smoking nicotine of one getting into trouble with mental health or other substances. For example, if you're prescribed an opioid and you're a heavy smoker, that's an indicator that you might misuse that opiate if if nicotine is on board. And so you know that it's a part of co-occurring disorders, I think is a very important point.

 04:55

All right. Tons of bad stuff in it that causes all these cancers and all this cardiovascular disease, you can see some of it looking like healthy and the carbon monoxide, the ammonia, the hydrogen and the

can see none of it looks looks neatny and the carbon monoxide, the ammonia, the benzene and the lead, the cadmium. You know, nicotine is the sort of psychoactive addictive component of it. But a lot of the medical consequences are from all these compounds that are in tobacco smoke all these proven human carcinogens. And, and, you know, we know about this now and we've seen decades of research in terms, in terms of the harms that each of these things can cause.

 05:35

We mentioned earlier, you know, some of these things to spell them out a little bit more all sorts of cancers. From those that you would expect from, you know, local irritation to, you know, increased risk of pancreas cancer or bowel cancer, leukemia, and then certainly cardiovascular disease, COPD, asthma, osteoporosis, it's not healthy. I think we made that point.

 06:02

It's also associated with a lot of other problems in one's life, you know, it's a barrier to recovery from other substances and mental health issues. You know, it's associated with financial hardships, employment difficulties, poorer mental health, social stigma, poorer appearance, you know, fires in house, my work is on the stigma of addiction, as I mentioned, in the introduction, and, you know, tobacco use is one of the most stigmatized health conditions there is and for better and for worse, in some ways, some of that social stigma has decreased use, but what happens is that a lot of providers have stigma towards their patients who are still smoking and when they come in with the medical consequences of their, their smoking, you know, we might have worse attitudes towards those folks than towards others. And, and part of it is, you know, we blame folks even as it's still very addictive, you know, for smoking and seemingly to cause harm to themselves. Associated with fires as well.

 07:02

So we've done all these public health things to drive down that number from in the 40s to 15%. And a lot of these initiatives are happening now with the vaping with vaping products and Juul, you know, a lot of anti-smoking advertisements. A lot of this- increasing taxes and age restrictions are very important. A lot of tobacco free laws and policies and then there's a bunch of support for cessation strategies, a lot of them are offered free by departments of health and local city and state levels. And, you know, there's just a huge push and you know, the sum of all of this is it went from being cool, being a cowboy smoking, to it being really something that people want to avoid and understand that they need to avoid.

 07:48

So nicotine is the active addictive ingredient in in tobacco and cigarettes and in these vaping devices and you know, works on the nicotine acetylcholine receptor, the nicotinic acetylcholine receptor, and it's an agonist. It feels good. You know, some sometimes people say I don't understand why people smoke, it's not doing anything to me, but it very clearly enhances concentration, alertness, arousal, in a very stimulant-like way. Certainly acts on the dopamine system and gets in the reward pathways. And, you know, it's pretty rapid, it gets- you know, you inhale it so it gets in there pretty quick and has a rapid effect on on reinforcement and dependence.

 08:37

Nicotine and reinforcing sensory stimulation associated are responsible for the compulsive use, the method of administration modifies the addictive potential, as you might imagine, with smoking and vaping you know, being much more rapid in terms of intoxication states than the dermal patches or chewing it. And you know, part of it is that it comes with all sorts of routines, you know, it has an oral quality to it, it gets integrated very quickly into one's day and to a bunch of other behaviors, from those ways to curb mental health issues, as we mentioned before to, you know, other, cued by other substances, the sex, the food and so, it is addictive, and it does, you know, work its way into other addictive behaviors and patterns in one's life as well.

 09:25

This just sort of highlights how, how inhaling something really increases the concentration of the drug in the brain in the quickest way. So it reaches the brain 20 seconds after emulsion, gradually increases the occupancy of the receptors over minutes. Smoking one receptor leads to significant occupancy of the receptor for you know, over three hours.

 09:50

The initial rapid rate of rise of nicotine occurs within minutes, the levels of nicotine-bound receptors continue to rise slowly are maintained for hours. And you know, one thing- You know, if you're a smoker is you really can build the intake based on number of puffs, intensity of puffs, depth of inhalation, and even how much nicotine you're getting on a given cigarette or vape depends a little bit on how you're using it. I mean, certainly, I've seen people that inhale their cigarettes and practically chewing them to those that sort of are a little more cautious or gentle with their, their intensity of inhalation. So, but often people are titrating it to a level that feels comfortable, they don't want to be too stimulated. But they want to be soothed and to feel okay.

 10:34

To the half life- it's around 2 hours. That accumulates in different tissues throughout the day. It does seep out a little bit, especially when you're sleeping and not using all the time. But you can certainly recognize that that happens during sleep. It's very involved with the cytochrome P450 enzymes in the liver. We'll talk a little bit about some of the bad interactions in a second, especially with tobacco that are important to be- to know it, especially for those on psychiatric medications. The major metabolite is cotinine, often in the urine if you're doing urine screens, and it does cross the placenta. It can be found in breast milk.

 11:16

You can see some of the details about the pharmacology here. First pass metabolism. Bioavailability is around 45% renally cleared, and then it certainly you know reaches high initial concentrations in arterial blood and lungs and distributed throughout the body.

 11:36

While it's absorbed in the bloodstream, nicotine has a volume distribution of about 180 liters and less than 5% of its binding to plasma proteins. Crosses the placenta, as I mentioned, found in the amniotic fluid and umbilical cord. And then even for breastfeeding mothers, it's important to note that it's found in concentrations approximately two times those found in blood.

 11:55

There are some interesting sex and race- race differences in metabolism that are important to know. You know, women metabolize nicotine faster than men. This is thought to be due to the estrogen effect on the the P450 system, specifically to the 2A6, maybe even faster during pregnancy. It was harder to cut down when you're trying to cut down during that time of life. And then a lot of people have different various variants of this CYP2A6 gene. You know might have different responses to nicotine, African Americans obtain on average 30% more nicotine per cigarette. And they clear nicotine and cotinine more slowly than Caucasians. Chinese Americans are noted to have a lower nicotine intake per cigarette and slower metabolism. Secondary to having a higher prevalence of those alleles. They would metabolize slowly and it's probably why Chinese American smokers have lower rates of lung cancer than either African Americans or Caucasians.

 12:55

If you're looking to assess people's use, you know, blood, salivary and plasma cotinine levels can be used. The 16 hour half life of cotinine makes it useful as plasma and salivary marker of nicotine intake, but really, it's the urine screens that are sort of the gold standard for following use. And, you know, we'll talk a little bit about the role of potential screens in a second. But you know, it's often not a part of the standard urine screen that you're getting in a hospital, where we see it in our healthcare system is that a lot of the ambulatory surgical centers use it just because nicotine can impact healing after surgery, and they're very mindful of their their outcomes. And so sometimes they're, you know, checking the nicotine levels to just make sure they're not smoking before surgery. And you often you know, when people do have surgeries, it's often a good opportunity to help people stop using.

 13:56

So as I mentioned, you know, it's there's a lot of interactions, especially from the hydrocarbons and the other things that you find in cigarettes. It's not nicotine but but a lot of other stuff that's in tobacco smoke that can, you know, alters the response of different medications, especially those metabolized by the P450 system, the 1A2, the 2A6 enzyme activity.

 14:21

And here's a couple things, a couple of the interactions to know about that are important about drugs, they may have a decreased effect due to the induction of the 1A2 and that includes caffeine. And then a lot of psychiatric medications. You might notice clozapine, olanzapine, haldol, thorazine,

fluvoxamine and so you know, this is especially important for our psychiatric patients, especially those with serious mental illness who are being stabilized in an inpatient setting.

 14:51

Historically, when you hospital you could see sometimes it's almost better for folks with psychotic illness because you get a sense of how they're responding to their medications. And so for example, we have a chronic psychotic disorder unit here at the hospital. And when they stopped allowing smoking in patients, they saw that a lot of people lapsed much quicker when they left the hospital. And because what was happening is that while they were inpatient, they weren't smoking. And so their levels of clozapine or haldol were more elevated than in the community when they started smoking. They're also drinking a lot of caffeine as opposed to being set off. It's about one to three antipsychotic medications. And then when they left the hospital, they started smoking, again, that drove down the levels of their anti-psychotics. And then they became, you know, they had psychiatric symptoms, again, and required rehospitalization. And so, you know, hopefully you use these acute settings to help people quit and sustain quitting. But it's important to note that many do relapse on cigarettes and that it can really impact their medications.

 15:53

You know, there's a lot of talk about how vaping nicotine can be used as smoking cessation in adults, you know, the risk is in adolescents. From a harm reduction standpoint, though, one wonders for folks with chronic psychotic illness because the vaping does not impact the levels because it's really the hydrocarbons in the smoke products and the tobacco that drives down these medications and not the nicotine itself.

 16:15

So just to reiterate, you got to be careful when you quit smoking because you've got to monitor the medications that they're on and make sure they reduce the caffeine and you might need to reduce the medication. And so it's important to be mindful of those for the psychiatrist or for those treating folks with, with psychotic illness. This is not talking about nicotine. We're talking about hydrocarbons in cigarettes.

 16:51

Also be mindful of the interaction with oral contraceptives. You know you can or it can alter the expected response or action of it. And it's recommended that OCPs are contraindicated in women greater than 35 years old and heavy smokers, as it can result in increased risk of serious cardiovascular effects- stroke, MI, thromboembolism.

 17:16

You can see some of the reasons it might be- appears to enhance the procoagulant effect of estrogens. It's also important to note though, that there's a lot of other things to be mindful of. It can result in less sedation from benzos, less analgesia from some opioids

result in less sedation from benzos, less analgesia from some opioids.

 17:35

Impacts some of the treatments for peptic ulcers. So it's- it's a mess, you have to be mindful of all these interactions when when people are smoking.

 17:44

Alright, so what does nicotine do in the CNS? It acts on the sympathetic system so it can increase the blood pressure and the heart rate, the cardiac output. At the same time it does cause muscle relaxation. And your smokers will tell you that. This happens via stimulation of the Renshaw cells, inhibition of motor neurons. Higher doses can release adrenal catecholamines and very high doses can cause sort of the opposite of the acute lower effects and cause hypotension or slowing of the heart rate.

 18:22

You know this, if you're a smoker, it causes arousal, but also relaxation at the same time. Enhancement of mood, attention. Results in relief of withdrawal symptoms. Obviously, if you're a smoker, you know, anything that you use chronically, I mean, you'll hear this when we talk about opioids or benzos. You know, it all helps at first. You feel good with every substance of abuse at first. That's why we tolerate all these terrible medical side effects of our use because it feels good at first. And to not recognize that you smoking cigarettes may make you feel good misses an experience of a smoker. The subtle thing though, is that once you start smoking all the time, what really you end up medicating are the withdrawal symptoms. And so it's as much the hijack act of the neurocircuitry and reward system as it is warding off withdrawal symptoms that propels the use forward.

 19:16

And so, you know, because of the withdrawal, as well as the enjoyment, you may need regular doses of nicotine to feel normal rather than to enhance their capabilities, cognitive effects, you know, that's just a well known effect of an addiction, and of course, psychoactive effects dependent on routes of administration, environmental factors. We've talked a little bit about that already.

 19:41

We've talked a little bit about some of the genetic predisposition to substances. You can see some of them that have been studied, including the P450 system. You know, I think the twin studies on the slide are the most notable and that monozygotic twins are more similar than dizygotic twins with smoking behavior and so we think about half the risk for getting stuck on cigarettes is, or nicotine, is genetic. And we see similar statistics for all substance abuse, that half the risk for addiction is, is genetic. And you know, we don't measure any of these genes. And so basically, if you've got a, you know, father and mother, other people in your family with it, you know, that means you're more at risk. And there's also some genetic influence on nicotine withdrawal symptoms, we think as well.

 20:33

We highlighted this in one of the earlier slides. But you know, a lot of those with mental health issues are smokers. The highest prevalence may be in those with schizophrenia and ADHD. For the schiz-folks with schizophrenia, there's a lot of theories about why this may be. Certainly diminished sensory gating to repeated stimuli. Smoking can relieve some of the negative symptoms that are associated with schizophrenia, the blunted affect, the emotional withdrawal, but also I think it's because of the interaction with their medications, you know, lowers the levels, and you might end up getting fewer side effects. Also, a lot of the medications are sedating. And you feel like you can concentrate more, sometimes when you're smoking,

 21:15

ADHD as well is associated with a lot of smoking use, early smoking use. And, you know, it's an important comorbidity to note in that group as well.

 21:28

All right, so all these risk factors to smoking, how do we know how much or what are some good indicators of the best measure of nicotine dependence? The heaviness of smoking index, the time-to-first-cigarette is a very good one. You know, if you're smoking, it's one of the questions to ask when you're taking the history is when's your first cigarette of the day, you know if it's or when are you vaping first in the day? If it's less than 30 minutes that indicates moderate smoking use, less than five minutes we're thinking severe use. And this has implications for treatment outcome. It can help guide you, you know how how much you need to give them for the initial nicotine replacement treatments. Should we remind them to put them on as soon as they wake up, can indicate a need for medications, especially if it's severe. And as I said to have implications for the dose of nicotine replacement, but also for some of the medications we'll talk about in a second.

 22:20

Tobacco tolerance- causes effects of individual cigarettes tend to lessen throughout the day. Overnight abstinence allows considerable but not complete resensitization. Everyone loves the first cigarette of the day. Populations of acetylcholine receptors subtypes that begin to change as other molecular mechanisms involving neuroadaptations come into play after days and weeks of tobacco use.

 22:46

Cravings are often you know described as powerful from folks who smoke you know, powerfully conditioned cues. Cravings become associated with everyday events. You know, it's the answer to every question. Once you start smoking, what you do when you wake up? After breakfast? You know, while taking the dog out? On your way to work, you know, your whole day becomes organized around smoking, especially with all these public health initiatives to not use. You know you can't smoke in so many spaces. I had a patient that- you're not allowed to smoke in Central Park in New York, and she's

not allowed to smoke at work. So she would walk from her building to Central Park smoking, stop smoking, walk across Central Park not smoking, smoke as soon as she reached the other side of the park. Smoke on her breaks throughout the day. And so you just- it becomes a part of so much. And relapse rates because it's so prevalent and legal. And, you know, so re-enforcing, as we mentioned, you know, shows really high rates of relapse, maybe the hardest thing to quit, up to 75% of adults who smoke want to stop but only a third- One out of three try. And only 3% of those do without aids.

 23:51

We need help, because it's hard. The striking thing is and you know, all of us that have been practicing for a while can attest to this, that even a heart attack, COPD, other medical consequences aren't sufficient to cause people to stop smoking and 50% of individuals with these conditions, you know revert to cigarette smoking days or weeks after leaving the hospital. I mean, that's really striking. You're hospitalized for a medical consequence of something and you can't modify the thing that would most help you survive- speaks to how powerful this can be.

 24:29

All right, we got question number one, as a reminder to do your- to play along with us and answer the question on the poll. I'll read it twice for you. Which of the following is a symptom of tobacco withdrawal? We're about to discuss this but see if you know it in advance: A- irritability, B- hypersomnia, C- elated mood, or D- decreased appetite. I'll read that one more time. Which of the following is a symptom of tobacco withdrawal? Irritability, hypersomnia, elated mood or decreased appetite. I think this one's a little easy. It's the irritability, A- you know, you're not sleeping as well, you're irritable. You're eating you know, some people use cigarettes because it helps decrease the appetite. And so you know, people often are mindful of, of their food intake as they, as they stop smoking.

 25:27

So nicotine use can, is continued to avoid the negative symptoms associated with withdrawal as I talked about before- known as negative reinforcement. The majority of withdrawal symptoms are distressing, nothing life threatening, but it's terrible, feels terrible. The intensity is reached about 24 to 48 hours after cessation. And certainly the body's rebelling and all those ways described there when once they withdraw.

 25:53

And here are some of the symptoms- can last weeks: depressed mood, insomnia, irritability, anxiety. If you've ever met someone trying to stop smoking, they're not the happiest camper and there's just a pervasive irritability. And it's really uncomfortable for a lot of folks, especially those with co-occurring mental health issues and anxiety can... some of the dysphoria and anxiety can feel really terrible

 26:22

11:55

You know, there's a lot of association with the MAOI system and which is you know, involved in depression and the catecholamines including dopamine and you know, there's there's definitely a an interaction between those who have mental health issues and, and different propensities for depression as indicated by the MAOI system and their issue with- with nicotine smoke and you can read some of that there.

 26:56

I think we've got this tons of toxicities and this just sort of further highlights some of the toxicities that exist in the lungs. The cardiovascular we mentioned quite a bit already. For women, some women-specific things to know about: lower levels of estrogen, earlier menopause, increased risk of osteoporosis and then the skin changes are especially notable right? The yellow staining of the fingers. The pink, the precancerous and squamous cell carcinoma on the lip and oral mucosa, enhanced facial skin wrinkling. Those things alone should be enough to curb use in those who are aging.

 27:32

So who does well? Who who's able to, you know, get through this withdrawal, through the hijacked reward pathways, through the gen- genetic loading and able to quit? So those who do well have a lower level of dependence, obviously. There's you know, being able to quit is associated with a higher socio-economic status, older age, male gender surprisingly, no behavioral health comorbidity, having less smokers in your social network, obviously, and then the ability to quit in the first seven days is very indicative- is a good indicator of your ability to stay quit. And then if you use cessation treatment, you know, that's a big- that can really help.

 28:12

So why is it so hard? You know, the data is striking, you know, it's highly addictive, obviously, we have options, we'll talk about some of the treatment options in a second here, but there there's not a lot. Sometimes it can be hard to access different groups as well. And, and a lot of our providers don't have good information. You know, I think, you know, the internal medicine docs and the pediatricians among us, we got a little de-skilled about tackling this in our patients just because the numbers are driven down. And often people aren't offered the medications when they- when they see a doctor. And again most, most don't use counseling and when medications are prescribed, even nicotine replacement, people often use too low a dose and don't keep people on- keep people on them for long enough time.

 28:57

Some of the ways to sort of assess it and do brief interventions are the 2A and R: Ask, Advise and Refer. Do you use tobacco? Do you vape nicotine, how much? What kinds? How do you feel about quitting? And, you know, you can do these sort of motivational interviewing type experiments with

folks, hey, let's let's try to quit for a day or six hours. What do you notice? You know, how much money are you spending? You know, what else can we do? And try to really engage people in a thoughtful way around their use to highlight that they need to use

 29:30

There's plenty of quit lines. Luckily, plenty of local and national resources that can provide free nicotine replacement treatment by telehealth options these days.

 29:41

Alright, so what are we doing for to help people quit? I'm gonna pause for a second and just go over my general quit plan for folks just so you have that information clinically. So the idea is that you interact with someone in a motivational interviewing way, you know, see where they're at, see what they like and don't like about using and the goal is to get them to to a quit date- to agree to a quit date. And about a week before the quit date, you can put on one of these first line medications for nicotine use, which we're about to talk about. And then on the quit date, you often put the nicotine replacement products on. So a patch for more than a pack a day, often 21 milligram patches, sometimes double the patch, if they're smoking more than that. And then you taper them off the patch, you know about monthly for around four months, you know, go from 21 milligrams to 14 to seven, you can add as needed gum or lozenges to get them through. And then the goal is to sort of wean them off the nicotine replacement over four months, and then hopefully to get them totally without cigarettes or vaping. By the end of that time period, of course, people will relapse. And you know, it takes so many tries, you know, six to 12, or you saw the statistics on how many people relapse. And so when they do, just say alright, let's set a new quit date. Let's start again. And you just keep rolling with with their attempts until they're able to get it there.

 31:04

Alright, so the meds that we're using in that spirit and MI spirit with the quit date, there's nicotine replacement, there's bupropion or wellbutrin, there's varenicline or chantix. And the idea is really to throw everything at them as I mentioned, especially if they're heavy smokers, you know, you need the counseling, of course, the groups if they're accessible, you need the meds and the nicotine replacement. And and sometimes you'll just say, Hey, these are all the options, I'm happy to give you all of them. They want to try just with a nicotine replacement. If they want to try just with the meds, that's fine. If they relapse, set a quit date, go over the options again, and start the plans and so it's the bupropion or the varenicline that you'll start about a week before the quit date. Bupropion's an antidepressant that's dopaminergic. I choose that sometimes if someone has co-occurring depression as it might work well with that. Varenicline works on the nicotine receptor. We'll show that in a second. You start it about a week before the quit date as well. It has a starter kit and a continuation pack that it comes in. And you're often keeping people on those meds for about a month after they finally stop smoking. But some people will stay on wellbutrin for a long time because it's helpful for depression. It's also been combined with naltrexone to form a weight loss drug, and so some people will stay on that even longer.

 32:24

Question number two for you. Get ready to answer it when it pops up. Which of the following is true of nicotine replacement therapy? So we're about to talk a little bit more- I gave you a little introduction there. So most people... A- most people who use nicotine replacement treatment become long term users of it. B- these medications produce serum nicotine levels which are higher than that of a smoked cigarette. C- most people use nicotine replacement treatment incorrectly or at too low a dose. D- Medicaid insurance never pays for coverage of over the counter products like nicotine patch, or gum. Which of the following is true of nicotine replacement therapies? Most people using nicotine replacement become long term users; they produce- these medications produce serum nicotine levels which are higher than that of a smoked cigarette. C- most people use nicotine replacement treatment incorrectly or at too low a dose, D- Medicaid insurance never pays for coverage.

 33:20

And the answer is C most people use nicotine replacement incorrectly, or at too low a dose. So people often are giving people the seven milligram patch only or as a "hey, buy some gum maybe that'll help." You've really got to schedule it. Have a couple of months' taper plan put that patch on every morning. You know that's to put on when you first wake wake up. People often take the patch off before bedtime as it can cause dreams or insomnia, weird dreams or insomnia and to really use it for long enough period to combine it with the medications. Almost no contraindications. Safe enough to be over the counter obviously.

 33:57

There's a couple other strategies we have including the oral nicotine spray, which you can use. Then, as I mentioned before, and this is certainly my experience, clinically, is that combining the patch with certainly medications- bupropion or chantix, or varenicline, or patch plus the gum or spray or all of the above, well tolerated; decreases withdrawal. If you have the patch on it's nice to have that immediate release thing you can put in your mouth too, because you're so used to that behavior from smoking. Varenicline is often the the silver bullet the global silver bullet for folks. You know, some people you give them varenicline and it's like, "Whoa, I'm never gonna smoke again." It works on the nicotine receptors a partial agonist blocks nicotine binding. And for some folks, it really does well.

 34:48

It's important to note that there's been concern historically that varenicline and bupropion nicotine replacement may make psychiatric symptoms worse and there's a lot of misinformation about this online that patients often Google, you know, but the EAGLES study was a good one that showed that it's safe. Even folks with serious mental illness like schizophrenia, or bipolar disorder, so no need to worry as much as, as is sometimes put out there online. There's been a lot of scandalous cases like "I took varenicline then I killed my wife" and crazy stuff like that.

 35:24

It wasn't related to the test. So we tend to think they're pretty safe. And they're effective. As as we've we've mentioned and show here.

 35:37

The FDA did have a boxed warning about the serious neuropsychiatric effects that they removed, just because of the study showed it was safe. But again, some of the misinformation even made its way on to- was in some early case reports. And it made its way into into the blackbox warning that was eventually removed. So again, all all users should be offered treatment, often in combination. And you know, the longer you're on it- four to six months, certainly the better.

 36:07

There's some gender differences in terms of response, you know, women are less likely to quit, as I mentioned earlier, this may have something to do with co-occurring psychiatric issues, less likely to be prescribed meds, less likely to be screened by doctors. Varenicline may be more effective for women. And you can even combine, there's sometimes that you can even combine varenicline and bupropion, throw everything at it, it's so hard that you know, you may want to just throw everything at it. That's the summary.

 36:43

And you know, you have to be mindful again of some of these enzymes, but again, it's much safer and much less interactions than if you're using cigarettes.

 36:54

If you're pregnant, again somebody in as- 2016 7% of US women who gave birth smoked cigarettes during pregnancy and associated with a ton of negative consequences during pregnancy. It's a good time to get people to quit you know, we're careful with meds and even nicotine replacement treatment but you know, they're they're considered acceptable second lines. Varenicline is not indicated. But but you can give the patch and gum or or Wellbutrin, if needed. Better they don't smoke.

 37:27

All right, in the remaining time, we're going to talk a little bit about the e- cigarettes and the vaping that sort of captured the imagination of our adolescents and even our adults. The main worry about vaping- I'm not a big anti-vaping advocate. I'm not ripping it out of adults' hands on the, on the street or anything or shutting them socially. But I- it's the adolescents, you know, it's- they're sexy, they're fun, they're accessible, you can use a lot early on. And so it's really the adolescent vaping. That's the increase in adolescent nicotine use via vaping. That's that's caught the attention of most Addiction Professionals and you know, we treat it similar to smoking cessation, we set a quit date, you know, we put them on the wellbutrin and chantix.

 38:12

On the nicotine replacement. For adolescents, those meds aren't FDA approved. And there's, there's

So the nicotine replacement. For adolescents, those meds aren't FDA-approved. And there's- there's not a ton of data. Although the American Academy of Pediatrics actually put out a nice sort of like, brochure or handout for their pediatricians to say, "Hey, you're gonna need to use this for adolescents because they're smoking a lot, you're gonna need to put them on nicotine replacement, you're gonna need to put them potentially on bupropion or varenicline just because they're smoking so much they need help help to quit." We often are starting with nicotine replacement, you often don't do it for four to six months, especially if they've been smoking for a lesser amount of time, you might try to get them off in two to three months. You know, but it's important to know...

 38:54

A little bit more on these e-cigarettes, which have transitioned to these fancy disposables. The- the bottom line is that they've got a ton of stuff in them, like they've only been around for like five years, and they have propylene glycol, they of course have nicotine, they have the sweeteners, they have a bunch of other chemicals that looks like they shouldn't be put in your body. And increasingly, we're accumulating evidence that they're going to be harmful to us physically, and they're probably going to cause cancers we just don't have the decades of follow-up like we have for for cigarettes. And so you know, the study is not going to come out in a couple of years that "Oops, you know, nicotine vaping nicotine is actually very safe."

 39:32

And you know, I think as the years go on, and that my pulmonology- pulmonologist colleagues are telling me that yeah, they're seeing increased folks presenting with with vaping induced lung injuries. There's, of course, some somewhere on the statistics, numbers increasing.

 39:49

During COVID looks like numbers dipped down just a little probably because the kids weren't around each other but they seem to be back up. Now the kids are around each other and sharing their vapes and, again, we have driven the cigarette rates down really low. And now, about a third of 12th graders are are smoking or experimenting with vaping.

 40:12

They're also vaping marijuana, which we talked about in another lecture during this, this series. And, you know, a lot of it is associated with the flavoring and, and everything else. One interesting thing is that, you know, yes, potentially for adults in the right way, you know, vapes- vapes, nicotine products may be a harm reduction method or way to stop smoking, if you can taper off. They're very hard to taper off because you just have them around you all the time. And you can get pretty high doses pretty quickly. There's some evidence though, that you know, not only do they introduce adolescents to nicotine, they may also introduce them to cigarettes and those who smoke who vape nicotine may end up using cigarettes and so that's a concerning direction.

 41:01

This was like pre-COVID. You heard about this especially, you know, especially associated with bootleg marijuana vapes thought to be largely from vitamin E acetate. But somewhere in nicotine alone about 10% for these, these catastrophic lung injuries we're seeing in the hospital. A lot in male, young males, and were thought to be due to some of these devices.

 41:29

Again, you know, it's it is people often try to switch from cigarettes to these and see if they can come down. You know, clinically we find people really struggle to do this, but it can be an option if people want to do it, I try it with them, right? I might even give them wellbutrin or varenicline and say alright, let's see how much how long we can last. Make this disposable last, you know, very mindful to nicotine concentrations as well as 3% and 5%. vapes. You want to keep them on the lowest dose as possible and really get to be really focused because it's easy to use them around the clock.

 42:01

All right, our last question. Select the one true statement about nicotine dependence: A- smokers that reported smoking within 30 minutes of waking are moderately nicotine dependent and may need medications to succeed in quitting. B- smokers who use less than 10 cigarettes per day are not nicotine dependent. C- users of electronic cigarettes almost never become addicted to nicotine, and D- treatment for tobacco use disorders should not be initiated until the primary mental disorder is in remission, and all symptoms have abated.

 42:34

Select the one true statement: A- smokers that report smoking within 30 minutes of waking are moderately nicotine dependent and may need medications to succeed in quitting. B- smokers who use less than 10 cigarettes per day are not nicotine dependent. C- users of electronic cigarettes almost never become addicted to nicotine, or D- treatment for tobacco use disorder should not be initiated until the primary mental disorder is in remission. And all symptoms have abated.

 43:01

The answer is A- smokers report smoking within 30 minutes awaking are moderately nicotine dependent. Remember with- within five minutes is severely dependent and then you might need medications to succeed in quitting including nicotine replacement. That's all I have for you. I hope you know a little bit more about tobacco and and vaped devices and are prepared to help your patients quit as well as of course to take the exam and I'll see everyone... So my references plenty. Here's the final slide. And I will stop. Thank you.