Please stand by for realtime captions. >> Good morning. Welcome on behalf of of the ASAM program planning committee. I am Abigail Herron chair of the committee. Thank you for contending this source. This helps you prepare to take the addiction medicine designed the course also provides a look across all aspects of addiction medicine for those interested in learning more about treating patients with addiction.

The review course on board exam study tool been Corfield mapped to the 2021 exam blue paint. In your tonics celibacy will find a copy and review course content map which outlines which chapters of the ASAM principles of medicine are outlined. >> New this year is a virtual exhibit hall and dedicated networking time to connect with faculty, colleagues, staff, and exhibitors. Join your colleagues for informal virtual networking events tomorrow and Saturday mornings from 915 two 945 a.m. Eastern time . UB randomly. So you can share study tips discussed content and find the study buddy to help you prepare for the exam.

During breaks between sessions, we encourage you to learn a network with staff and exhibitors in the virtual exhibit hall. Those breaks will take place today and tomorrow at 10: 45 a.m. and 1230: p.m. all times are Eastern. On the final day of the course, Saturday there will be one break at 11:30 a.m. Eastern time. >> Today will be covering the following sessions. Neurobiology of addiction, alcohol use disorder, sedative use disorder, opioid use disorder, tobacco use disorder, cannabis use disorder, stimulant use disorder, other classes of drugs, and behavioral addictions. >> During the sessions, you'll be able to submit questions for faculty using the Q&A back from the right-hand side of your screen. Additional instructions will be provided at the beginning of each session. Some questions will be answered during the respective sessions and other questions will be answered during the four faculty panel Q&A sessions.

The faculty panel Q&A sessions will take place today , July 22nd at 6:15 Eastern time, and tomorrow, the 23rd at 3:30 Eastern time, and again at 16:15 Eastern. And Saturday July 24th, at one: 30 p.m. Eastern.

For those of you take any of them we encourage you to take advantage of the board exam study tool, or the best. >> Information on how to claim CME for the review course in the pre-courses can be found in the syllabus or under the sea in any and more section. You will find a how-to video that washes through the steps, please note that CME cannot be claimed after the course can include includes on Saturday. All sessions will be recorded and made available to registrants for free in the learning center beginning on August 9th 2021. You'll have access to the session and recordings on demand 24 seven for the next three years. Please contact the ASAM app by emailing education @asam.org. Thank you, and once again, welcome to the @asam.org Review Course in Addiction Medicine . We are sure you will find this to be a great value to your practice and patience. Next is a welcome message and opening remarks from the ASAM president William F. Haning, MD, DFASAM, DFAPA John A. Burns School of Medicine, University of Hawai`i. Good morning, >> I want to properly opening you to the 2021 Review Course in Addiction Medicine . I fervently

think Dr. Herron and doctors are both vice chairs tired faculty for their work and leadership in developing the curriculum and delivering this great course.

I also want to let you know that Dr. Herron has been chair of this committee for the past six years, and this is our last year serving in that role, she's done and incomparable job in leading this course. The incoming chair for 20 2022, is Jonathan Avery, and Dr. Herron will serve as vice chair. For those of you taking the exam Camorra here because you want to learn more about addiction medicine, welcome to our home. This is a big tent of addiction medicine. ASAM, the American Society of Addiction Medicine, used to be the medical Society of drugs and dependents society. Not all kids get the name they want, and some point it became ASAM. And that's where were staying. We wish that you would join us and we thank everyone who is taking the time to prepare yourself for the examination and for the task of treating our patients with addiction.

Not attics, not alcoholics, persons with an illness. If you aren't planning to take the exam this year, we want you to know that ASAM did work with the AB p.m. the American board with addiction medicine, to lobby the American Board of medical specialties with the narrative of extending the addiction medicine pathway through 2025. >> Let's take a moment to contend it's consider the importance of learning more about addiction at this time.

Addiction provides the metaphor for not merely chronic, projectors a syncretic, and contagious diseases, but the single most continuous and reliable disruptor of the social fabric in an above famine and disease. The solutions two and by the way, will be the solution to the epidemic of imprisonment as well. This is certainly been an unprecedented time of strife this year, loneliness, sigh isolation, discrimination smoldering COVID-19, and the spread of the impact of addiction. Individual's family subject to discrimination and prejudice are disproportionately affected and often have less access to treatment resources, less effective care, and less continuity of care.

Reasons for the failure to correct the deficits are unfortunately a sham so they must be corrected. ASAM is working to make quality and effective treatment available to everyone. So, I think each one for taking the time to learn more about this complex condition. American Society of Addiction Medicine aspires to produce the highest quality of training about the illnesses that comprise addiction. For those of you who are already of ASAM, thank you. If you are not a member of ASAM, please get involved. has many interest groups committees and councils. If you join us, income deeply involved, you become part of the solution of an American crisis.

For those who are interested in joining ASAM, we invite you to join now. There is a savings of 50% off the 2021 membership link. It is listed, and the discount code appears on the slide and the ASAM will make it available to all registrants.

I would say by the way, that this is been consistently the best Disney E ticket that I have ever purchased in my career. >> ASAM is planning the next annual conference program in developing plans to ensure safe

environment I hope all of you will join us at the ASAM 53rd annual conference titled innovations in addiction medicine and science, which is March the 31st, through April 30 , 2022 in Hollywood Florida.

Next is our first session to kick off the course. Neurobiology of addiction, key concepts and models with our keynote speaker .

Thank you.

Hello everyone, the giver joining us for this session, I have no disclosures. Here's how we are going to go about it. We're going to start with neurotransmitters, then move on to the basic model of how we understand addiction during today's times. Then move to new and improved model at some point which is the basic idea. And then move on to implications of basic neurobiological concepts for treatments. I close with neurotransmitters. Once again. Neurotransmitters. On this, here it is. This is a new course and prepares people for taking the exam and these are the things that need to be committed to memory. For every type of abuse, you have a responding endogenous neurotransmitter. This is going to be of explanation in a little detail as you go to different classes of drugs and abuse. But, there you have it. In terms of exams, these neurotransmitters are very popular. They are easy to test. So, people who write exams are particularly attracted to having these neurotransmitters being tested for you. >> Awry, commits those to memory . And we'll move on to the basic model of addiction.

All right. Up until rather recently, people thought that addiction was a moral failure. A weakness of the world. People could not resist interpretation of drugs and alcohol in [Indiscernible] succumb to the illness. Then somewhere around 1980 or so scientists around medicine said& Not a typical biosocial illness or of biosocial psychosocial spiritual illness, and the two causes are biological and social forces. Biological forces, primarily genetics, psychological forces, different psychological theories about people using drugs, four self-medication theory of addictions are particularly popular, and quite correct. And, social , of course determinants of addiction and microenvironments, the subcultures, and neighborhoods in which we all live in love and play and work that defined the addiction.

So when these forces come together in a particularly complex fashion, they change something in the brain. They flip the brain switch on, and from that point the addiction text to have a life of its own to a large extent independent of the forces that set it in motion to begin with. He said that again.

You have this file sought biological cycles logical social forces they engraved something in the brain and from that point the addiction lives on its own. This has implications that because all our patients live with the family to see if only we were able to go in there and find the true cause of their addiction, unpack the original problem, lance the boil, as Freud would say, express the pus, then boom , they wouldn't live with the traumatic event. They wouldn't be depressed. They would need the cocaine, they would be depression and addiction free for the rest of their lives. Unfortunately it's not as simple as that. Why? Because once that brain

switch has been turned on, the addiction has a life of its own, and if you have any chance of success, of course you're going to try everything you can to address this psychological and social issue, but chances are that you will need additional independent treatment for addiction for the patient to be well. >> All right? That's it. We're done. I got two minutes into a three-day course command everything else were going to be talking about just bells and whistles on this fundamental concept. A wonderful model. That is what we use clinically everyday . But, taken to an extreme, it has a major flaw.

It suggests that in the absence of significant biological, psychological, and/or social forces the risk of additions is negligible. Lessig about this. You have a 16-year-old kid, let's say that kid has no biological vulnerabilities to tobacco, their parents did not smoke cigarettes, grandparents do not smoke cigarettes, no biological risk factor is. Let's say that 16-year-old does not have ADHD, or aggression, or anxiety, nothing to self medicate against, no significant psychological forces. Let's say that 16-year-old lives in an environment where hurst prints don't smoke cigarettes, no peer pressure. Would it be okay to go up to her and say, smoke away? You can smoke all the cigarettes in the world you want, and you will never become addicted to tobacco, why? Because you lack a true cause of addition those biological psychological social forces. How insane that would be? Correct? Exactly the major mistake we would make when it came to opioids.

What you have in front of you is an article --Is not even an article, is a letter to to the editor, 10 1/2 lines, and 10 and half of the most damaging lines in all of medicine. >> And Wise is a damaging? Because it gives a ratio. It essentially said that if there's a person who doesn't have significant vulnerabilities to addiction, but have a risk of becoming addicted to opioids in the order of 12,000 to 4 . Out of 12,000 people to use opioids, four will get addicted. >> A huge mistake. Of course this has been put aside is being discredited. The editor himself said this is one of the biggest mistake in his lies. The damage was done. It was published in the Journal of medicine in 1980 and physicians were taught that the risk of opiate addiction is 12,000 to 4.

So, we now know that this is not true. And so we have amended our initial model to include use of the drug itself. The very molecules entering your body is an independent factor along with biological so psychological social forces of addiction. So forget the vast majority of people who get addicted to prescription opioids in the early 2000 did not have biological psychological and social risk factors just lower back pain. They went to the doctor got high dose opioids with high frequency and hydration dosage, and they end up getting it did. >> Okay. Let's move on now to the brain itself. Let's try to unpack this. All of us have this pleasure and reward pathway in our brain. They happen around the nucleus the center of the reward of the brain and limbic system. What these pathways do is scan the world at all times for things that are pleasurable and important, naturally they do more than that, they scan the world for things that are safe and important. Imagine your very own dopamine level nothing too good is happening, nothing too bad is happening, it's around 90%. If you had an amazing meal. Chances are it will go up 250% from baseline. Sex does twice the job of food, and jumps

the level of the hippocampus to the 2000% baseline. These are everyday pleasurable rewarding salient things we normally enjoy in our everyday world.

Now, out of 30 million chemicals we've identified in all of the universe, there are only about a little more than 300 that have this particular ability to go exactly in the same centers of the brain and activate the mesolimbic system in a way similar to food and sex and of course these are drugs of abuse. As you see in the diagram here the jump the level to 200, sometimes 300% of the baseline. >> From a biological perspective, addiction can be thought as the hijacking of the pleasure and reward pathways of the brain.

All right. Now, once the person gets addicted to a drug, the nucleus, hippocampus and related structures are very closely connected to the hippocampus the memory center of the brain and the amygdala, the emotional center of the brain. We are going to get back to that in a few minutes, where we talk about the new concept, but that pleasure reward pathways of the brain the nucleus hippocampus are sandwiched between our memory and emotions and that's why these hijacked pathways of the blade brain are so temperamental. I'm not saying the people cannot recover, but the majority of people end up beating the disorder, but the ability to go back to using substances for a long long time, if not for the rest of their life.

Now, miles and miles and miles away from all of this drama that happens in the primitive part of the brain are the frontal lobes. In the frontal lobes, is possible for executive pop function for rational thinking, for planning . It's the more civilized part of our brains. Fortunately, or unfortunately, the more primitive part of the brain with the nuclear circumference of the pressure will pathway and the hippocampus is not very well connected to the frontal lobes.

Before the age of 22, not even the hardware is fully developed between the limbic system and the frontal lobes. That's how we start to understand the adolescent. The adolescent falls and loves and fails to see the light at the end of the tunnel is not so much that she or he doesn't have fully developed frontal loads or this is part of it, it's primarily that they cannot use those frontal lobes to modulate an explosive limbic system. >> Now this disconnect between the frontal loads of the more primitive part of the brain, is not all bad news.

How do we start to understand appreciation of the arts? Music? A sporting event? Or even having sex unless we are able to disconnect the frontal lobes from the more visceral, more primitive parts of our existence. Allowing another human being to enter and your body or entering the body of another human being is absolutely absurd from the frontal lobe perspective. If was left to the frontal lobes, you would never be able to have sex. We have to be able to couldn't disconnect this apparatus to allow the primitive part of the brain to take over. Now this is all nice and good, and we do have some judgment on how to do that, until the pleasure reward pathways of the brain are hijacked by drugs and abuse. At which point there's one agency that can keep the brakes on the operating part of the brain is not open to people because of this it can disconnect

that I just described. Ultimately, the war on drugs is a war between the hijacked pleasure pathways of the brain that scream I want, I want I want, I need, I need, I need, and the frontal lobes a try to keep the person safe. When the hijacked pleasure reward pathways when, the patient relapses, and when the frontal lobes when, the patient is in recovery.

This is the fundamental two-part equation of addiction. >> The hijacked pleasure reward pathways of the brain versus the prefrontal cortex that tries to keep the person safe. >> Okay, let's see what we have added to this fundamental model. We have three different concepts, the motivational circuitry, that and T Ward pathways, and the immaterial perception. All right, first of all the frontal lobes are not uniformly are best friends. Now it was said many years ago when he for biology caught up with things, when they said the stinking thinking of addiction. It turns out that medial part of the prefrontal cortex may very very well be affected directly by gradual abuse, and make the person be enabled to use rational thinking to his or her benefit. >> What am I saying here? There is the lateral part from the cortex this is very much as I explained in a classic bottle, the person, the part of the brain that is the ally of any clinician, the part of the brain that keeps the person safe , and then there's this stinking thinking of addiction, the medial part of the frontal cortex can that can actually get the person in trouble. Seemingly irrelevant decisions, we can rationalize things to facilitate addiction , all that is probably the result of the effective motivational circuitry of the brain which resides primarily in the medial part of the prefrontal cortex pick >> This is from late 2020 American Journal of psychiatry Association. The American Journal of psychiatry, and it essentially has three parts. The intoxication part with the sailings as we talked about before talk about the hijacked pleasure pathways of the brain the more primitive part of the brain that gets hijacked when the person gets addicted to drug abuse. This is countered by the prefrontal cortex. But it has two parts to it, the good guy which is the lateral part and the stinking thinking of edition which has to do with the preoccupation of the patient which has to do with when they are lateral part of the prefrontal cortex. Major interests and major focus of the Society of addiction has been the extended amygdala, and the dark side of addiction the , sometimes called Hyperkatifeia, in fluence by genetics childhood trauma, all of these epigenetic's, they affect the anti-reward pathways of the brain, the dark side of edition. This is the most complex one. And probably the most difficult one to explain, but I'm going to try my best.

All right, I'm going to try to do that by playing a couple of games first, then we are going to see how we go through this together.

This is money here, we are going to play the game as best you can.

So let's play the first game. I give you two options. Either usher a gain of $250, or option B, you have to gamble in which case you have a 25% chance of gaining $1000, and a 75% chance of gaining nothing. Let sit for second.

All right. The majority of people would go for the sure gain of 250. People who are more Russ Bowen, may go for the gambling. But most of us

will go for for the short game. By the way who came up with this kind of games, both are psychologists and are getting a Nobel prize in info makes to show that you can capitalize in this kind of middle distortion and make millions. >> All right, let's erase the amount from our heads the best we can, and let's try to play game number two. Again I give you two options. Option a, assure loss of $750. Option B, you have to gamble. You decide to get a copy of the 25% of losing nothing, or 75% chance of losing it thousand dollars. Let it sit for second.

All right. The majority of us would actually choose option B . >> Now, let's put that in terms of edition. Both if you keep on playing, you are not going to make or lose money, they're completely equal in terms of financial gain or loss. But when it comes to gains, then we are very concerned. We avoid risk like in game one. >> But however, when it comes to losses, we start feeling that kind of pain, then we've got to become far more risk prone.

As it turns out, earlier parts of addiction people are more conservative. The plan to reward past byways of the brain are talked about before go on spikes that give you gains, are the main affair and therefore people do everything they can to kind of ensure that they make these gains it did not take away any chances. However, as addiction progresses, the anti-reward system seems to be taking over giving people that dark side of addiction . Given that person that hyperkatifeia, that inability, that annoyance, irritability, restlessness, malaise , anxiety, insomnia that kind of thing, and then people will do anything they can to avoid that painful situation. >> So, addiction really starts more as a pursuit of fun and games, and then moves over to a desperate attempt to avoid definite pain. >> Here's an older experiment, it's Datsun grass, this is happening over a period of weeks and months, but the top panel shows the activity of the reward path of classic [Indiscernible] reward pathways, and the bottom panel shows the activation of the anti-reward pathways to the brain which are much more complex in terms of their neurotransmitters. As you see here in the earlier parts, the [Indiscernible] upticks mask whatever activation you have of the anti-reward pathways. But as the process regresses, the [Indiscernible] upticks become less and less prominent, this is not just because of tolerance, it is more because of the addiction circumference, while the anti-reward pathways become deeper, deeper, deeper, and deeper in the end of the Friday the addiction. So the third comportment of hyperkatifeia of the navigated the effect of the addiction seems to be more was somebody that lives with a chronic form of the illness.

All right. And finally, the three new concepts that we are federating is interception. Interception is a sense that lives at the insular part of the brain between the inner and outer cortex. Interception signals to us the state of our physical being. All kind of somatic signals have to go through the insula through interception. And they get consolidated at the insula , at which point the insula pretty much decides which ones are to be experienced. Which ones are to be given meaning, or not.

I think this is gotten a little confusing. >> Let's play a game. Oh, let's do an exercise, okay? Let's do this exercise and I will try to explain this more. When I say so, I wanted to get up wherever you are in

close your eyes for 20 seconds. Okay? During those 20 seconds, I want you to focus on somatic signals, things that are being --That your body is telling your insula. The room is too hot, the rooms to call. You want to go to the bathroom. A fleeting sexual thought. A craving smoke a cigarette. If your cigarette smoke, whatever it is, that is physically your body telling your insula. So during the 22nd, were not to talk, were not to do anything, we're just going to be concentrating on your somatic signals. I hope that you are going to be experiencing some of those somatic signals that you may not have been experiencing over the past half hour or so because of the lecture.

The concept here is that the insula, for the past half hour may have been deadening those the somatic signals, and getting the signals that you got the low back pain, you have a little kind of like pain but has been offloading them to the advantage of the lecture itself. If I stop talking for 20 minutes, and talk about something else, and all the signals that a been bombarding, the insula will be allowed to be experienced. So that's the idea here. So 20 seconds, everybody gets up, and we close our eyes, I'll get up as well. So. Close your eyes. >> All right, that's it. [Laughter] so I hope during the 20 seconds, you did feel things that were there before, but they were not experienced because of the preferential activity of your insula to only give meaning to some things but not to others. How does that relevant how is that relevant and addiction? It seems that when all those forces are battling it out in your brain, you have the hijacked reward pleasure pathways of the brain, yet the lateral and the prefrontal cortex and give you sets you got the medial read frontal cortex with stinking thinking of addiction, you have the anti-reward pathways with the dark side of addiction trying to --Keep on streaming for you to avoid the definite pain. All these things are duking and battling it out at a very end, in order for the person to either pick up or not pick up the insula, is the one that needs to give meaning to this kind of craving for the person to actually behaviorally perform the act.

There's a wonderful study , from almost 15 years now, were Buckley showed where people have a stroke and they are heavy heavy smokers, get a stroke and the insula and survive the stroke, and there's the other side, not only do they smoke cigarettes, they quit smoking after heart attack or stroke, but also important no craving for cigarettes. >> Pretty amazing. The way we understand that is that the craving for the cigarette is there, it keeps him bombarding the insula, but because of the stroke of the insula, it's not really available to give meaning to that craving, and therefore the person has not experienced the craving for cigarettes. All right. Let's move on to achievements and how we are discussing this. First idea 1950s 1960s, anything the patient suffered for, we put them on the couch and hope for the best. Terrible idea. Absolute failure. Why was psychoanalysis or psychotherapy not be helpful in treating addiction? What does psychoanalysis do best? Psychoanalysis shrinks the frontal lobes, that's what shrinks for the psychiatrist. We shrink the frontal lobes and we allow the more primitive part of the brain to take over. Essentially we get permission to patients to break some rules, have some fun, go over there, be happy. >> The adult to suffer from addictions, what we want to do for you is shrink your frontal lobe so we can allow the more primitive part of the brain to take over. We are going to look

at you if you have three heads. If anything, with that, it's exactly the opposite. The task is to beef up, especially the lateral part of the prefrontal cortex, in order to get the person to be safe.

So that's why it was a terrible idea, it was a failure , and actually that's what gave rise to the myth that addiction has a treatment. You have one and one only treatment, that treatment doesn't work, he works to make people work worse . Your obvious conclusion is that makes the condition untreatable. >> The idea is not that when seeking an addiction there's nothing that you can be done about it, it stems all the way back to the failure of psychoanalysis to treat the addiction. The second idea, let's welcome up boot camps. The Senate non-model in California, the refundable denial, we are going to slap the person around, sometimes physically, write down the defenses, and therefore, you, reshape the person from scats. Another terrible idea, most people get worse. Most people don't have the problem fixed, so that was another disaster along with the first slide.

And now we live in the third grade of our current treatments which are medications, mutual help, and psychotherapy and counseling. These are certainly hallmarks of safe and effective addiction treatment . I just want to say a few words for each one of them. What we have in terms of medications?

To classic strategies in it is addiction medicaments, on the one hand we have agonist treatment. Let me give you monocle that is going to activate the system to make adverse to the drug of abuse, and then what we have is methadone for opiates a patch of nicotine for tobacco, and other treatment fully activating the cell and therefore cutting down the cravings for

On the other hand, we have partial agonists, mail trucks and for alcohol. Or heroin. They shoot up, nothing happens, afterwhile they say it's too much money too much trouble too much legal exposure they don't use.

The major major innovation has been the introduction of a third strategy of partial agonists. What they do , is on one hand they do give you a shield that protects a person at the same time activates the cell at the 40% level, and therefore cutting down the cravings. For tobacco, for all appeals, the major strategies for treating addiction from pharmacologically in the 21st century. As you can imagine a major advantage of [Indiscernible] as a partial agonists in the ceiling at very high doses these are very rhythmic this does scale, very high doses, you don't activate the cell wall at hundred percent so it's virtually impossible to overdose and have respiratory collapse due to the turnoff.

All right. Mutual help. This is an older study. It was done where we ask Marigold staff to bring things that were most important for people's recovery.

Here we have it on the very left. The medical staff said housing government service and outpatient treatment are at the top of the list. And the patients were in appease God medical services at the bottom of the list. And we asked patients to rank those 11 treatments, 11

interventions, components of recovery, in a very different picture emerged where in appease God and job in government services at the bottom of the list. So differentiation of what is needed to be in recovery. And then Lisa Goldfarb have the amazing idea of going back and asking people asking the medical staff the following question. What do you think the patients think is most important for recovery? We asked the medical staff what the patient's consider most important for recovery? And look at that this is the third panel on the right. Once again housing, outpatient tubing, and medical services are at the front of the list, and God spirituality AA are at the bottom of the list. >> So not only we live in a different page that our patients, but we also don't really have a clue what that pages that are page patients live in. A major disconnect between the medical establishment in our patients. >> Once again, this study was done , 25 years ago, transit [Laughter], anyway, at the end of the century. It's been years ago. Things have dramatically changed now, but I'm not too sure that they have. >> 25 years ago, yeah, it is 25 years ago. [Laughter] all right. I think that was a psychodynamic moment that I had there. I can let you know my fellowship was that Bellevue.

All right, in terms of psychotherapy and counseling, cognitive behavioral therapy is the cornerstone of psychotherapy, and you can have more in lecture on that I'm sure. But what is emerging and has emerged as a major force as well is motivational interviewing. This analyzes automatic thoughts behaviors and feelings and allows people to have some alternatives to dysfunctional automatic thoughts, behaviors, and feelings. Originally, the way it works, at earlier stages of change. It's wonderful , CBT rewrite requires engagement for the pavement , it has homeward structure, and if someone is not particularly interested in changing anything in their lives, it's unlikely they'll be able to fully engage in CBT. Enter motivational improving, and it helps people become more motivated for change.

And the fourth faith of treatment , mindfulness . We haven't fully cross our T's and dotted all our eyes at this point, but it is emerging as quite a potential major treatment in addiction medicine. Now, how does that work? We essentially take advantage of the insula , what we talked about before. So right at the cusp, right at the hijacked pleasure and reward pathways are about to overwhelm the lateral part of the prefrontal cortex, right where the addictions about to overwhelm the persons result to say stay sober, right at that moment with the cravings are bombarding the insula and saying use to use, use, use, use, use, use . The person may be able to disassociate her disconnect to see how his life happens is a different level for mindfulness exercises. Tricking the brain to wait a bit, ride the wave of the craving, and therefore experience their solution on the other side and be safe. I always use exercises like think about your craving as a suitcase in the baggage claim area of the airport, and he goes around, and you know that you can pick it up, or you can leave it and it's going to come around again. Giving a person a more sophisticated sense of self , giving them an observing ego as we also call it in psychiatry and see their lives as possibly happening from the outside in. >> A couple of things that are emerging are CBT apps. Again, not all of these are crossed and the eyes dotted for that, but it seems like CBT may be particularly amenable to cell phones and apps and being

able to and of very much like the Fitbit, and the physical exercise, interventions that we have in overall wellness. And finally, the last light I want to show you here is the reanalysis of the data in terms of people's sexuality.

As you probably know sexual and orientation can be broken down to his sexual identity , and is broken down to sexual identity behavior in terms of men sleep with men women, both, but there's a third dimension of human sexuality and that is attraction. So what is your inner kind of sexual attraction? And that is more dimensional, approximately a little bit on the Kinsey scale. So these are data that are just large enough that we were able to analyze it in terms of sexual attraction as well . And here are the findings. >> The shape of the curve for men and women is very similar, so let's just look to the left side diagram. The y-axis would have a measurable substance use disorders, and on the x-axis we have in green somebody being completely gray , red, bisexual, yellow, completely straight. And then we have this interesting bar here where people are almost K, but not exclusively, or almost straight but not exclusively. And it turns out people who live in these areas of being almost K, or almost straight, may have the highest risk of substance use disorder. And there's good old Freudian style psychodynamic theory, this does a great job in analyzing intrapsychic forces having people was stressful intrapsychic [Indiscernible] that they may have and perhaps his way allow you the person to have less anxiety, less stress, and therefore perhaps less use of substances. This is not been proven. Is the last light of the lecture, just thought it would be one of those things that need further research to be established.

All right. One more pitch for you to memorize. Neurotransmitters for exam taking purposes. And here they are. Once again , and with that we are going to conclude and here are the five things that I want you to remember from today's lecture. The fundamental model of addiction, addiction is the war between the hijacked pleasure neural pathways of the brain, this salience, the basal ganglia, and the executive function of the prefrontal cortex six especially the lateral part of the prefrontal cortex. Three model concepts. Motivational secretary, the anti-reward pathway of the brain, with hyperkatifeia and the dark side of addiction, and intercept and which gets the insula completes today's model of addiction. In terms of psychological treatments, agonists and antagonists and partial agonist for the treatment of addictions in terms of psychosocial treatment which will help, CBT, twelve-step, work behavioral therapy, motivational interviewing, and and quite possibly, mindfulness. >> And, finally, for the third time. Know your neurotransmission before sitting for the exam. Thank you very much. It was wonderful. >> [Event Concluded]