Podcast 47: Diabetes and Substance Use

Dr. Rita Kalyani, MD: Welcome to Diabetes Deconstructed, a podcast for people interested in learning more about diabetes. I'm your host, Dr. Rita Kalyani at Johns Hopkins. We developed this podcast as a companion to our patient guide to diabetes website. If you want a trusted and easy to understand resource for diabetes or to listen to previous podcasts, please visit hopkinsdiabetesinfo.org.

Today we are thrilled to welcome Dr. Anika Alvanzo, who will speak with us about diabetes and substance use. Dr. Alvanzo graduated from George Washington University School of Medicine and Health Sciences, has a master's in biostatistics from Virginia Commonwealth University, and is board certified in internal medicine and addiction medicine. She is a former faculty member at Johns Hopkins University and currently a principal at Health Management Associates, where her consulting is focused on supporting state and local jurisdictions in community needs assessment and strategic planning for behavioral health service delivery, provision of training, technical assistance, and coaching to behavioral health providers, training on an implementation of the ASAM criteria and advancing cultural humility and health equity in addiction treatment.

Dr. Alvonzo's publications span topics including gender, race, and ethnic differences in the trajectory of and service utilization for substance use disorders and the association between psychological trauma, post-traumatic stress, and substance use, particularly in women.

Welcome, Dr. Alvonzo.

Dr. Anika Alvanzo, MD, MS: Thank you, Dr. Kalyani, it's great to be here.

RK: We are so excited to hear from you today about the intersection between substance use and diabetes. This may not be something that people immediately think about as being connected, so I wonder if you could first start by telling us: what is a substance use disorder, and is that even the right term that we should be using?

AA: Yes, substance use disorder is the right term. Substance use disorder is actually the diagnostic term that we use to characterize the disease of addiction. The American Society of Addiction Medicine, or ASAM, defines addiction as "a treatable, chronic medical disease involving the complex interactions among brain circuits, genetics, the environment, and an individual's life experiences." When we talk about substance use disorders, substance use disorder is the compulsive use of substances despite adverse consequences, and those consequences ultimately lead to either physical and/or psychosocial functional impairment.

When we're discussing substance use disorders, there are 11 criteria that we use to define substance use disorder or make the diagnosis. I typically like to group them into three categories: physiology; criteria that are indicative of loss of control over one's use of substances; and then criteria that are indicative of the associated consequences of use.

Examples of physiology would be tolerance, meaning that somebody needs to use more and more of a substance to get the same effect. Another [example of] physiology is withdrawal. If somebody stops using a substance abruptly or dramatically reduces the amount of substance that they're using, they may have symptoms or a withdrawal syndrome. Those are the two criteria that fall under the category of physiology.

Then things that may be indicative of loss of control—so inability to cut down or control use, using more than originally intended, giving up important activities in order to use a substance, craving, spending a great deal of time either obtaining a substance, using the substance, or recovering from the effects of the substance.

Then, criteria that reflect associated consequences of use. That would be things like the development of physical or psychiatric problems associated with use and continued use despite those problems or exacerbation of those problems; role failure—not meeting obligations at home, at school, or in the family; interpersonal problems, either again with loved ones or with others; and use in hazardous situations.

So those are examples of the 11 criteria that we use. And then once we make the diagnosis, we stratify it based on severity—mild, moderate, or severe—with mild being two to three, moderate being four to five, and anything six or more being associated with a severe substance use disorder.

The only other thing I'd say is that substance use disorders are chronic diseases. Just like other chronic diseases, they are characterized by periods of remission and periods of recurrence. I think it is important to know that prevention efforts and treatment approaches for substance use disorders are generally as effective as those for other chronic diseases. While many times people with substance use disorders are stigmatized, we know that substance use disorders, like other chronic diseases, with effective treatment respond as well as other chronic diseases like diabetes, for example.

RK: Thanks so much for breaking that down for us. That was quite a bit of information, and it's good to know about how this might be different than substance use in general. I think many of us could understand what substance use is. Could we clarify when we talk about substance abuse, what substances are we talking about?

AA: It varies; it can include what are considered legalized substances: that's alcohol, tobacco, or nicotine (which is the active ingredient in tobacco). In our state and many others, cannabis is now a legal substance, and then there are opioids, which can be obtained either legally via prescription or illegally on the street, and stimulants like cocaine, methamphetamine, and hallucinogens. Any substance that has the potential to be addictive. Caffeine is another substance that we often don't think about but that can be associated with disordered use.

RK: Thanks for going through all of those because, like you mentioned, some are more common, like caffeine. I think many of us can relate to that, whether it's coffee, tea, sodas, or other products versus others that might be legal in some states versus others—you mentioned cannabis being legal here in the state of Maryland, but that might differ across the country. Then those [substances] that tend to be restricted or illegal across the United States.

When we talk about substance use, it sounds like there's a spectrum of what we're talking about. When we talk about substance use versus substance use disorder, you had outlined for us those criteria of what makes it a disorder. It sounds like things that impact daily life, things where you may become addicted or really need it more for the high or the effects that it has, or having used it so much that it interferes with your usual functional activities. Is that right?

AA: I think it's important to know that there are a range of ways that people use substances. Some people never use substances, and then some people may engage in what we call

experimental use or social use, and then some people are on the continuum where they are using substances chronically, and their use of substances has subsequently resulted in consequences that then lead to functional impairment.

When we talk about substance use disorder, we're talking about the compulsive use of substances in the setting of continued consequences. You mentioned that there are different substances. I think again, there's a lot of stigma related to the disease of substance use disorder, or people with a substance use disorder. But I think we also recognize that, whether the substance is considered a legal substance or illegal, the process of what's happening in the course of a substance use disorder is the same. Somebody who has a nicotine use disorder and somebody who has an opiate use disorder—while the receptor systems in the brain may be different, the neurobiological changes that are occurring in the brain with chronic substance use are very similar. Hopefully, that will help reduce some of the stigma associated with substance use for patients and people who are listening.

RK: I was struck by what you said: it is using these substances, whatever ones they are, despite the consequences, despite knowing how they're affecting someone's daily life or affecting others around them. You mentioned the stigma, the fact that this is a disease that can be treated, and then really addressing the stigma that might otherwise be there, that this is due to neurobiology—this addictive potential—and it can be treated. When we talk now about substance use in diabetes, are people with diabetes at higher risk of using substances? Or, what is the interaction of these two conditions?

AA: I am not aware of data that suggests that people with diabetes are significantly more at risk of using substances. What we do know is that when somebody has a substance use disorder, particularly an active substance use disorder, it is not uncommon for them to have poor outcomes for other co-occurring diseases that they may have, including diabetes. Often in the midst of an active substance use disorder, people are not attending to their health, to their medical appointments, to the monitoring of their blood glucose, or to taking their medications to treat their diabetes.

I do want to say, though, that there are some substances that may be associated with a higher risk of developing diabetes. So not looking at people with diabetes who may be more likely to use substances, but looking at people with a substance use disorder who, because of their substance use, may be at greater risk for developing diabetes.

There is data that suggests that chronic use of nicotine may be associated with higher rates of diabetes. Specifically, nicotine may have some role in increasing insulin resistance. Then there's data with respect to alcohol. In terms of the mechanism for alcohol, we know that chronic heavy drinking can result in pancreatitis. The pancreas is the organ that produces insulin to monitor or regulate our blood sugar. Particularly in the setting of chronic pancreatitis, you can get damage to the beta cells in the pancreas, which are the insulin-producing cells. With long-term damage, what ultimately happens is people get enough damage to those beta cells that they can't produce insulin. Then they develop diabetes associated with the pancreatitis that they developed as a result of their alcohol use disorder.

RK: You mentioned nicotine or smoking. We know that smoking is a risk factor for cardiovascular disease, or heart disease, and that people with diabetes, especially, are at higher risk for developing cardiovascular disease. Clearly, having both is not a good combination. Then you also mentioned that nicotine can contribute to insulin resistance in

some situations, which is very interesting, that there could be an underlying mechanism by which it could contribute to the development of diabetes.

AA: There is some data to suggest that this year ASAM released the seventh edition of his text with the principles of addiction medicine (2024), and in there, there is a chapter that looks at the endocrinologic effects of substance use. They talked about how, for people with chronic nicotine use, there does appear to be an increased risk of the development of diabetes. There appears to be a sex-related effect, such that men who are current smokers have greater risk than women. As you said, we know that nicotine use, particularly cigarette smoking in and of itself, can lead to a number of consequences that look similar to long-term diabetes and cardiovascular consequences. It is difficult to say in this instance if this is a result of nicotine itself or, more likely, the byproducts of cigarette smoking. But yes, if you've got somebody who has both diabetes and is smoking cigarettes, then you are looking at an exacerbation or increase in their risk for developing these cardiovascular complications.

RK: Yet another reason to cut down on nicotine use, isn't that right? Now you mentioned alcohol and the relationship of pancreatitis, which, as described, you could get alcohol pancreatitis, and that could be related to diabetes development too. I have always been struck by what seems to be at times conflicting data about alcohol use and diabetes risk. I seem to recall that there has been literature suggesting that maybe one or two drinks a day can be protective. Can you talk about that?

AA: There is some literature that suggests that lower amounts of alcohol may be protective or may result in a decreased risk. But when we're talking about alcohol-associated pancreatitis, that occurs in people with chronic, heavy drinking. So drinking that exceeds the recommended limits chronically (for an extended period of time). So yes, at times there does appear to be almost this U-shaped or dichotomous risk for alcohol based upon whether it's low-level drinking within the guidelines or when we have people who engage in chronic, heavy drinking.

RK: It does seem like with that mild to moderate use, there has been mixed literature. But what we're talking about here today is the heavier use, the substance use disorder that could be associated with alcohol, and the adverse outcomes that could be related to that in addition to the development of diabetes.

Some of the other substances that I know have been described in relationship to diabetic ketoacidosis and that I have seen during my medical training are the use of cocaine, and one of the things that I have wondered is whether the use of these substances, such as cocaine, and the relationship to the development of ketoacidosis, especially with type one diabetes, is more related to the effects that the substance has on the person, so they can't manage their diabetes as well, or whether there's an effect of the substance itself that puts people at greater risk of developing these hyperglycemic complications. I wonder if you might have any comments about that.

AA: I am less familiar with data on cocaine in terms of its impact on the metabolism of glucose. I would venture to guess that in those instances, it is more likely to be associated with someone's use being so disruptive or, again, when we talk about that functional impairment, that it's impairing their ability to successfully manage their diabetes.

RK: So it sounds like it is both, depending on the substance—either a direct potential mechanistic effect or effect on the insulin signaling in the body, like in the case of nicotine that could put someone at higher risk for diabetes or higher blood sugars in general, or probably more generally with these substance use disorders, the disruption of the daily routine and the management. We know that self-management at home is so important for diabetes, and so having a substance use disorder on top of that just makes it much more challenging. I wonder if, in an individual who has both these conditions—who has diabetes and a substance use disorder—it is like a chicken and the egg question: which came first or which to address first. I am sure it is a multipronged approach, but I was just wondering if you could outline for us some general strategies or approaches that you might recommend for a person with diabetes who is challenged by these substance use disorders and how to address them in practice.

AA: We often have this conversation, particularly because we know patients with substance use disorders can have a number of co-occurring conditions, whether it's a co-occurring biomedical condition or psychiatric condition. Traditionally, we used to have this co-occurring psychiatric condition. Do we treat the psychiatric condition first, or do we treat the substance use disorder first? Inevitably, what research has shown us is that an integrated approach where you are addressing both things concurrently is the most effective treatment. We know that with somebody who has diabetes that is poorly controlled, we need to help them in terms of the management of their blood sugar. But if they've got an active substance use disorder, their ability to successfully manage and gain control of their blood sugar is limited.

Ideally, you want to address both at the same time. Ideally, in an integrated setting, we know that is not always possible, but if somebody is being treated for their diabetes in a primary care setting, if the primary care setting is able to integrate behavioral health treatment focused on managing one's addiction or at least screening to identify the presence of a substance use disorder and then appropriately linking to treatment, assuming patients are willing to go, that is the most effective approach to try to address both at the same time.

RK: It seems like it should be an integrated approach to addressing both conditions. For our audience: an individual who may have diabetes who is wondering, "I use substances; is it too much, or is it okay?" How would someone know whether they may have a substance use disorder? What symptoms might they see in themselves? Or how could they get a better insight into whether their own behavior is disruptive?

AA: I think one of the things is, again, looking at how they're using substances; what are the substances doing for them, and then what is the impact of their use of those substances? If somebody is having a drink every now and then, or smoking cannabis every now and then, but not having any consequences associated with that use or any functional impairment associated with that use. Then it is less likely that they have a substance use disorder. It is when somebody is starting to have consequences associated with that use, and they're continuing to use or find that they are not able to stop or cut down on their use despite those continued consequences. In terms of how to identify that; one is having a conversation with their medical provider, and there are a number of different screening tools that you could find online as well that they could search. The ASSIST is an acronym for the Alcohol, Smoking and Substance Involvement Screening Test. The ASSIST covers all substances. There's the AUDIT or AUDIT C, which is the Alcohol Use Disorders Identification Test. There's a full

audit and then there's also the audit C, which is the first three items, specific to alcohol. But again, those are some publicly available tools that can be used either in a clinical setting or if somebody wanted to search those tools online. But I would say if somebody had concerns, my encouragement to them would be to have a conversation with their medical provider.

RK: Those are great tools to know about. I agree; with any level of concern bring it up: bring it up to your healthcare provider or bring it up to a family member. Speaking of which, what if you are a caregiver of someone with diabetes and you're concerned they may have a substance use disorder? How do you think a caregiver should gently approach it? I can imagine you mentioned the stigma attached to it. I can imagine that even the person who has the disorder might also have strong feelings about it.

AA: Yes. What I think is important for caregivers and for others to know is that chronic use of substances causes changes in the brain and changes in the brain in a number of areas, including the reward center. So that it hijacks the reward center of the brain. Initially, when people are using substances, they get a spike in the release of dopamine, which is the primary reward neurotransmitter. But over time with chronic use, that reward center essentially down-regulates itself so that it becomes even more difficult for somebody to have a release of dopamine with an activity that would normally have provided a reward—spending good time with family and friends, a great workout, or something that would normally provide a natural reward; that reward system gets downregulated. It becomes more and more difficult for people to experience pleasurable events. There were many times in my treatment career where I have had patients say, "At this point, I'm not using to get high. I'm using to feel normal." So you have that and changes in the stress response system, and then you've got changes in the stress response system—that fight or freeze system. So you get changes in that system such that particularly when people are going through withdrawal, they have an increased response, a stress response that then motivates the behavior to continue using, particularly in the setting of substance withdrawal.

Then there are chronic changes that occur in the air of the brain that deal with what we call executive function. So that's things like decision-making, impulsivity, and judgment. Sometimes initially, it can be difficult for an individual to recognize in themselves that they are having a problem with substances. So again, I think as a caregiver, one thing I would encourage is to not give up on your loved one or the person for whom you are caring. Try to involve as many people as possible; so again, if the caregiver has a concern, bring that concern to the attention of the medical provider.

I think it may be helpful for the caregiver to identify resources in the community that may help support them in their caregiving journey. Whether that is Alina or there are support groups that are specific for people who are loved ones or who are caring for those who have a substance use disorder, getting support for themselves.

But I would just encourage them to recognize that it is their loved one; the behaviors that they may be seeing in a loved one who has diabetes but may also have a substance use disorder are not a reflection of a moral failing or a personal choice. There are chronic changes that are happening in the brain. I think helping family members and even clinicians who don't work in the addiction space be aware of that, hopefully, will allow people to have more

patience and grace as they are working with individuals who may have a substance use disorder.

I can tell you; I did some caregiving for both of my parents before they passed away—caregiving is hard. As much support as you can get, just caregiving alone is hard, let alone adding caregiving for somebody who has a substance use disorder. Get as much support and resources as possible. Then again, bring it to the attention of the medical providers so that they can provide additional support.

RK: It's great to hear about the importance of a good support system, as you mentioned, even support for the caregiver, which can be challenging. I appreciate you sharing your own experiences as well. When we talk about treatment, then, at the point where someone is ready for treatment, as you mentioned, it might just not be to get high anymore but really could be that they have a reset in their brain, that this is their new normal. So it would be understandable that it takes time to reset the brain again. Then also the withdrawal effects that I know some of these substances can have when you stop taking them and your body's used to them. I wonder if you could talk just a little bit about the withdrawal strategies in general and treatments that are available for people having withdrawal symptoms. Are these the kinds of things that require being in a preserved program, or can people get treated for these substance uses at home?

AA: That's a great question. I think it depends, so it is going to be individualized. When we think about withdrawal syndromes, all substances actually have a withdrawal syndrome. Some of them may be a little shorter or maybe less severe than others. The withdrawal syndromes that we are most familiar with, particularly when somebody may need to come in contact with medical treatment for them, include alcohol withdrawal, benzodiazepine withdrawal, and opiate withdrawal.

Starting with alcohol and benzodiazepine withdrawal, those depending upon the severity of the withdrawal can require inpatient medical treatment for management of that withdrawal. Again, this is why when we are talking about caregivers or family members who may be working, it's so important to involve the medical professionals. Make sure the medical team is aware because some of these withdrawal syndromes may require inpatient management depending upon the severity of the symptoms. For opiate withdrawal, there are some instances where it may require inpatient management, but it often can be managed in an ambulatory setting with the initiation of medication.

For those three withdrawal syndromes in particular—alcohol, benzodiazepine, and opioid use—there are medications that are available to manage that withdraw. For alcohol and opiate withdrawal, some of those medications can also be used for ongoing treatment. I think it's important to know that there are medication treatments available for some substance use disorders, not all, but for some of the substance use disorders, we have medication treatments available.

Then for others, for all substance use disorders, there are behavioral or psychosocial treatments that are available. Again, figuring out what's available in your community, and again, hopefully your medical professionals can assist you in accessing what is available in the community.

RK: I think it's so important to emphasize what you just said—knowing what the resources are in your community and then knowing that there are medications out there to help with

these three withdrawals, especially mentioning the benzodiazepines, alcohol, and opiates. And that a host of behavioral and psycho-social interventions are available for any of these substance uses. It is important to emphasize that there are many different treatment options, and it sounds like the first step is acknowledging and diagnosing or identifying the substance use disorder.

AA: Yes, absolutely. You have to be able to identify it in order to treat it and recognize that again, there are potentially multiple paths to treatment and, for each individual, that path may look different. There is no right or wrong path to recovery. While some people may use medication in the treatment of their substance use disorders, others may not; whether you use medication, behavioral treatment, or both—it is an individualized decision.

RK: When we talk now about people with diabetes specifically, and we think about the communities that are affected by diabetes and the communities that are affected by substance use disorders—are there overlaps, or can this really impact anyone of any background?

AA: Yes, I think it's important to know that substance use disorders can affect anyone in terms of any demographic, any race, or ethnicity; there's no respect of socioeconomic status, geographic location, sex, gender, or sexual orientation.

Anybody can be affected by substance use disorder. However, we do know that there are disparities with respect to race and ethnicity in terms of who is more likely to die from their substance use disorder, particularly when we're talking about the current overdose epidemic that we are in.

There is clear data that Black people, particularly older Black men and Indigenous people, often younger Indigenous women, are at increased risk for dying from their substance use disorder or dying in the setting of overdose. There is also clear data on disparities with respect to access to treatment, both racial and ethnic disparities.

There are disparities by disability. So people with physical and medical disabilities who have a substance use disorder, particularly an opiate use disorder for which we know there are effective medications, are less likely to be prescribed medication than people without a medical or physical disability.

There are differences in risk based upon sexual orientation or gender. So there are disparities and inequities in substance use disorder. We also know that some of the same populations that are disproportionately affected by diabetes may also be disproportionately affected—not disproportionately affected in terms of the rate of substance use; there is no data to suggest (with the exception of some communities) that the rates of substance use are higher. We do find that the rates of consequences associated with substance use tend to be higher for racial and ethnic minorities and some of the other groups.

RK: Thank you for pointing out those disparities in consequences, resources, and outcomes that can occur among different populations, especially ethnic minority populations or other minority populations as well. We know that diabetes in general has health disparities and inequities that may also contribute to part of that outcome that you're describing with substance use disorders. Addressing the availability of resources and making sure that people have equitable access to care is very important.

I thought that we could touch base on the opioid epidemic; you mentioned it briefly. We have not talked about it in the context of diabetes. There has been some literature to

suggest that because people with diabetes might be more likely to have chronic pain due to peripheral neuropathy, vascular disease, or other complications related to diabetes, they might be more likely to be prescribed opiates as well.

I wonder if you are familiar with or have some insights into the use of opiates and those with chronic diseases in general and what you might say in terms of the use of these pain medications versus non-opiate therapies, for instance, in these populations.

AA: One thing I will say is at this point I no longer refer to it as an opioid epidemic; that is where it started. At this point, I call it an overdose epidemic because we are seeing an increase in deaths from multiple substances, in addition to opiates, often in combination with opioids. Yes, the current epidemic did start with—admittedly, it started with the medical and pharmaceutical industries and our prescribing practices with respect to pain and utilization of opioids for pain.

What we have seen is that over the years those prescribing practices have changed. Sometimes you wonder if the pendulum swings too far because there are some people who do have chronic pain, whose chronic pain may best be managed with opiates, who saw a sometimes-inappropriate reduction in their opioid use from it or their opiate prescribing to manage their pain.

I want to be cautious about this; certainly we need to be more judicious in terms of our prescribing of opioids—while making sure that we do not go too far in the other direction, where people who are in chronic pain who are benefiting from their opioids and not having evidence of an active substance use disorder to their opiates are being removed from opioids.

So that being said, yes, it did start with the prescribing of opioids. Many people then subsequently developed a substance use disorder to the opioid to which they were prescribed. That started in the early 1990s. When we talk about the epidemic, we often talk about it in waves. The late 1990s to early 2000s is the first wave associated with the prescribing of opioids. Then in 2010, approximately, is when we started to see a rise in heroin-associated deaths. As people who had developed an addiction or an opiate use disorder to the prescribed opiates were no longer able to access them, then they may have transitioned to heroin.

Also, financially, heroin was significantly less expensive. If you were relegated to having to purchase something on the street, heroin was less expensive than buying a pill of oxycodone, so many people transitioned. Then, probably about 2013 is when we started to see the rise of these illicitly manufactured fentanyl, specifically, or now people are referring to them as "highly potent synthetic opioids," which is illicitly manufactured fentanyl.

You started to see a rise in deaths associated with fentanyl and its analogues in about 2013. In truth, even today, that's what's driving the majority of the epidemic: this high-potency synthetic fentanyl that is on the street. Fentanyl and its analogs that are on the street are what's driving the current overdose epidemic.

Then many people will talk about a fourth wave of the epidemic where, around 2014-2015, we started to see a rise in stimulant deaths. Again, more likely in the setting of concomitant opioid use. Many times people purchased what they thought was a stimulant, and it was either fentanyl or laced with fentanyl. Then you see people dying, increased deaths associated with stimulants.

That being said, when we are looking at substance use disorder, we certainly need to focus on opioids, but we need to focus on the larger substance use in general. But as

physicians and other medical practitioners who are prescribing, we do need to be more judicious about opioids and our prescribing of opioids and recognition of non-opioid approaches to management of pain. There is a lot of data on non-opioids, whether it is acetaminophen or ibuprofen, in terms of adjuvant medications for the treatment of pain. We do need to look at that as part of our practice as well.

RK: It is so interesting to hear about these different waves and the provider role in some of this—the accessibility and how that has impacted what drugs people are accessing to numb their pain. Then there are these synthetic versions that might be laced in other products that people don't realize. It is something that all of us have heard about, and in the context of diabetes care, anyone who is at risk for pain or could have pain-related complications, such as neuropathic pain, whether we can see what diabetes or other kinds of pain could be at risk for this. I appreciate you going through all the history and then also the different forms that are out there for our listeners to be aware of as well. We have covered a lot today. Did you have some other comments that you wanted?

AA: Yes, I am just going to say one thing: I would say, for people who are prescribing, if you are prescribing an opioid for management of pain, you should also be prescribing an opioid reversal agent. Whether it is naloxone or nalmefene, you should be educating your patients and their families on how to use that reversal agent, should it be needed.

RK: It sounds like that is also good for patients and their families to know about too. If their provider does not talk about that reversing agent, they should ask about it.

AA: Yes.

RK: We do that, for instance, with people who are at risk for hypoglycemia, who might be on insulin—we give them glucagon as an emergency rescue. It is different than the reversal that you're talking about, but it sounds like they go hand in hand. Thank you for bringing that up.

As we wrap up our podcast today, might you have some parting words for people who are listening with diabetes, family members of people with diabetes who are concerned that they or their loved one might have a substance use disorder but might be afraid to step forward or might be afraid to seek resources? I wonder what you would say to them and also what other helplines or anonymous resources or anonymous call centers there might be for them to even just start getting information if they're not ready to make that step.

AA: Things that I want to say in terms of leaving people with something.

One, addiction is not solely based on one's personal choice or moral failing; it is a chronic disease, and there are chronic changes that occur in the brain. But like any other chronic disease, it is treatable, and there are resources and support available.

I think it is important to know that there are medications for treatment for at least some of the substance use disorders and that the evidence shows that they, at least particularly for opiate use disorder, are often first-line treatment for the substance use disorder.

Recognizing that there are multiple paths to recovery and whether somebody is taking a medication to treat their substance use disorder, whether they're using exclusively

behavioral and other psychosocial supports for treatment and of the substance use disorder, all paths can lead to recovery in terms of resources available.

The Substance Abuse and Mental Health Services Administration, typically, that acronym is SAMHSA, has resources. SAMHSA has resources related to getting assistance with treatment for substance use disorders.

The National Institute on Drug Abuse, which is the NIH Institute, has a lot of resources and education. If people are looking for more information, it has a lot of information about, particularly drug use disorders.

There is the National Institute on Alcohol Abuse and Alcoholism (NIAAA), which is the corresponding institute in the National Institutes of Health related to alcohol use disorder. They have a lot of information and education and some resource materials as well.

If somebody is in crisis, 988 is the new number for crisis. If you've got a family member who is in crisis associated with their substance use or potentially co-occurring mental health disorder, 988 is where you can call to get information in a crisis; information, and assistance.

RK: Dr. Alvanzo, you talked about. So many great resources. I wonder if there are any other resources that you'd like to highlight for our audience today.

AA: Yes, there is one additional resource that I'd like to highlight. The American Society of Addiction Medicine (ASAM) is the professional organization for people who are treating those with substance use disorders. In addition to being the organization or the professional society for those who are working in the area of addiction or substance use disorders, there is a lot of information and education, particularly as it relates to policy and advocacy related to substance use disorder and the treatment of substance use disorder. That is just one additional resource I would like to highlight.

RK: That sounds like a great resource; thank you for highlighting it.

Dr. Alvanzo, thank you so much for sharing your expertise today, for talking to us about substance use and substance use disorders, the different types of substances, the types of treatments and treatments for withdrawal symptoms that might be available, the importance of resource availability for people of all populations, and then really, the stigma that some might still feel or hear about and resources that people have to make that first step to seeking treatment and having treatment for this treatable disease.

We appreciate your expertise today, so thank you for being here.

AA: Thank you. Thank you for this opportunity to talk about this; it is an important issue. I am so happy to have the opportunity to come on and speak about this with you and your listeners.

RK: I'm Dr. Rita Kalyani, and you've been listening to Diabetes Deconstructed. We developed this podcast as a companion to our Patient Guide to Diabetes website. Our vision is to provide a trusted and reliable resource based on the latest evidence that people affected by diabetes can use to live healthier lives.

For more information, visit hopkinsdiabetesinfo.org.

We love to hear from our listeners. The email address is hopkinsdiabetesinfo@jhmi.edu.

Thanks for listening. Be well and see you next time.