NAADAC

ADVANCES IN TECHNOLOGY IN THE ADDICTION PROFESSIONAL,

PT IV: THE ART AND SCIENCE OF PREDICTING RECURENCE

AUGUST 13, 2021

CAPTIONING PROVIDED BY

CAPTIONACCESS LLC

for assistance, email support@captionaccess.com

http://www.captionaccess.com

* * * * *

This transcript is being provided in a rough-draft format.

(Communication Access Realtime Translation (CART)

is provided in order to facilitate communication accessibility and may not be

a totally verbatim record of the proceedings)

* * * * *

>> JESSICA O'BRIEN: Hello everyone. You're in the right places for our Advances in Technology in the Addiction Professional, Part IV: The Art and Science of Predicting Recurrance presented by Dr. Jes Montgomery. My name is Jesse O'Brien and on the content manager here at NAADAC the Association for Addiction Professionals. Department homepage for NAADAC webpages listed on the slide. Bookmark this page to stay up-to-date on the latest in addiction education.

Closed captioning is provided by CaptionAccess. Check the checkbox to use the link for closed captioning today. We are using Zoom webinar for our webinar today and most of you are probably familiar with Zoom but just in case there are a few features and Zoom that are not that are different from the Zoom meeting. First in the chat box but we use it and feel free to chat and let us know where you are here from today.

Communicate with each other as well as the panelists that are here. And we have a Q&A future and typing your questions. If you see a question someone has written you like, give it a thumbs up and it will move it up in the questions. It is a nice way to curate questions and identify the ones people want to hear the answers to the most. Feel free to engage.

As many of you know, every NAADAC webinar has its own webpage that houses everything you need to know about that particular event. That CE quiz for this will be available as soon as the session is over and you can access an online CE quiz and from the same webpage which I recommend you use.

It is there for your assistance if you need it. Let's introduce our presenter. Dr. Jes Montgomery has worked in addiction over 30 years as well as practices recovery from a personal and family perspective.

The foundational concept for ViviHealth solution is a result of a 15 year search for objective ways to engage recovery beyond simply detecting relapse. He has advocated for innovative and purchased fundamentally changed how recovery treatment is accomplished. He received his doctoral degree from Louisiana State University of medicine. He's a diplomat of the American Board of Psychology and Neurology and the American Board of Addiction Medicine and has worked in the treatment of addiction since 1987. Dr. Montgomery served as a psychiatrist and medical psychiatrist including Sante Center for Healing and the recovery center. He maintains a limited private practice in recovery and addiction medicine. I will turn myself off and hand this over to Dr. Montgomery.

>> DR. JES MONTGOMERY: At this point we should have joined together. Good morning or early afternoon for some of you. As was noted I am Jes Montgomery and it is a pleasure to be here. Talking about what the future holds for addiction medicine, addiction treatment and recovery.

Our goals and objectives are as stated. We will talk about the process and relapse or recurrence can be captured and made useful and it can be a part of recovery itself. We hope to understand the insights that come from precursors identify three data that can indicate a risk of relapse or recurrence. And we recognize the usefulness of interrupting relapse recurrence through the use of artificial intelligence and machine learning.

Before I go any further, full disclosure, I have a financial investment and stipend from ViviHealth. While it does intellectually inform and factually inform this presentation, it does not influence it.

One of the things that is a struggle in being therapists and those who treat addiction is we spend somewhere between 1-20 hours a week with our clients and patients. The rest of the time when they are not sleeping or eating junk food or wasting time otherwise, we don't know what is going on and we have to wonder what is really happening in their lives? If only I could be sure they went to the meeting and how do we know? We have the report and sign off sheet and we have to trust that knowing working with a group of people who are experts at manipulating and running things.

If I could know they were honest about their mood and feelings. We know their frustration when someone says I am fine. Our sense of self and intuition says it does not feel that way. What if I knew more about their sleep habits and patterns than what they tell me? I can see the bags under their eyes and yet they tell me they are sleeping fine. They go to bed at the usual time and wake up at the usual time.

There are so many variables we have no access to. That is part of the gamble and frustration

of treating those who struggle with addictions. So far, much of our view and work in addiction, our goal is abstinence. We treat people. We get them to that point. We monitor them.

You get them to where we have measures of their sobriety. But we also know that they have relapse thoughts which I call pre-lapse. Those thoughts come up and many times their guilt and fear and struggle with a missed opportunity and sense of loss leads them to lapses in judgment in those near misses.

The alcoholic ending up in the parking lot of their favorite liquor store and have no idea how they got there. Sometimes making the decision to call a sponsor or friend in recovery for help and sometimes stepping into relapse. One of the things that I have worked with in the circle in this process is there is a statement that says relapse is a part of the process.

I encourage us to change that message because relapsing is not a part of the process. Relapse is a part of the process of addiction. Relapse thinking and relapse lapses in judgment are definitely a part of recovery.

For many people, those thoughts never go away. However, they do not have to move forward because spiraling in this cycle of recovery is a spiral that leads only into shame. My experience is that shame is the most numbing emotion we can have. It shuts out every rational thought, every genuine emotion and opens the door for the magic of addiction to whisper in their ear, I know how to make this better.

Part of what we look at is what do we really have in our back pocket in terms of the art of addiction? We have our knowledge. All of us are trained and educated and the majority of us are experienced in our own recoveries and what we live there in.

We also have skills of observation. When we sit with our clients, sit in a group, we are constantly scanning and watching for those subtle cues that we need to bring into the group or individual setting.

We have the ability to interpret that hopefully without being threatening or challenging to just bring the question of what if you are not telling me the truth right now? What if you really did not trust me? We interpret their behavior and hopefully in a safe way.

When it boils down to it, many times we are relegated to hunches. That nagging feeling that says I am just not feeling what they are saying. We all know if we just bluntly say that, we get into a power struggle. We know what we are feeling and that is so difficult to translate into guidance. And to guide people. I learned a long time ago when people in residential treatment want to know how long their length of stay is.

My go to is say you are here until you finish these objectives. And usually in a 12 step based program that is step 1, 2, 3, life story and recovery plan. We have those in place and everyone feels your behavior matches them, then you are out of here. But always tell them there may come a point when I do not have a good answer for you.

I will honestly say my gut tells me now is not the right time. It is a hunch. Let's sit on it 24 hours. It is a gamble because many addicts and alcoholics in other addictions continue to worry about that. They continue to have that natural distrust that has come in over the years.

And the signs of addiction, we have good science about knowing when someone is intoxicated or using. We know how to catch them with a drug screen or a blood alcohol content bad breath machine.

We know how to measure intoxication. We are also very well-versed in identifying withdrawal. Identifying when it is safe and when it is medically dangerous. We know what to do for that. We also in recovery as well as in diagnosis have the biological screenings. We have urine drug screens that use radioimmunoassay. Those are the cups that are immediate read in the first screen the labs do which basically use antibodies to see if they match with what is in the urine.

Those are usually verified or best verified by gas chronophotography and a complex thing that

identifies molecules and how they move through a medium and how they line up in the process. Those are exact identifications. One of the areas that fails is the resurgence or up insurgents of Delta 8 in the CBD stores. Delta 8 THC has the exact same molecular weight as Delta 9 THC which we know to be psychosomatic.

And less the assay has been developed to separate the talk about which is a very complex process and to my knowledge is still reasonably unreliable, all we get is a positive or negative in the reports from the labs are 50% of the time Delta 8 may be missed and THC will show up negative. Even our best science is not as reliable as we would like it to be.

For alcohol, our major reliance is upon breath alcohol or saliva alcohol. It is mostly excreted and unchanged in both saliva and the breath. It is easier to find it that way and much more reliable because in a blood sample unless it is processed within 10-15 menu, it continues to degrade. The body continues to metabolize it.

We have the EtG and SuG which test metabolites of alcohol. The only way you can get those in the urine reliably is by sending out alcohol through the liver and kidney and have excreted. They're very reliable.

In the blood, we can test the -Peth test which is a metabolic product of alcohol in the body. The only way it can be there is if there has been ethyl alcohol in the body. That takes up to three weeks to fully degrade. Unfortunately it is not a shot for shot measure of alcohol. But it does give us an indication if somebody has had a significant intake of alcohol within the last three weeks.

We had the capacity to look at hair, nail clippings. There were other skin based assays not as reliable. This can tell positive or negative not with a reliable measure but positive or negative if a substance has been introduced into the body and metabolized through the system and showing up in the hair or nails any time in the last three months.

It is a very sensitive process but it does not give us a true timeline. The one thing that is

different is if you see cocaine and heroin or nail, it is an external contaminant. You look for the benzyl alekonene in the hair nail clippings because that is metabolized in the body.

Otherwise if the metabolic products of the drugs are there, they will show a positive or negative in the hair and nail clipping assays.

Let's talk about technology. Everything in our world revolves around technology. We are meeting today due to technology. We may be on a computer or a phone or a smart phone or on a pad. There are dozens of ways we might be connected. That technology is recording information about us.

It knows when we logged on. It knows what we are doing and where we are. All of that information is logged somewhere. We do not know where it is stored or how to make it useful but we know that data is there. What is data?

It is basically numbers. Computers work with ones and zeros. The study done at the University of Pennsylvania by Anna Rose Nelson and her crew showed in the functional MRI, the brain responds to a stimulus or reminder of cocaine, sexual objects, alcohol, food, especially chocolate, and gambling reminders that is in 33 milliseconds.

When we talk about a five gigahertz phone system, we are talking about 5 billion ones and zeros in a second. That is considerably faster than our brain works. The data has to be processed into something useful, otherwise, it is much like watching some of the older movies where you see ones and zeros running by the screen and somebody being able to tell you what is happening in those.

It is not particularly useful just as data. It comes from all sorts of sources. Some of the most common ones we can use in recovery or things like health bands, the Fitbit, the iPhone, all of the hundreds of knockoffs gather data and it tells us through the use of lasers things like our blood oxygen level. It can tell our blood glucose level.

You can assay our pulse by measuring the change in the diameter of capillary arteries in the skin. And from that, we can encapsulate things like respiration and variability of the heart rate which is a useful thing in many measurements. We can understand many things about what is going on in the body.

We have measured these things in the ICU for ages and they are useful in medicine. They are just not useful as raw data. We see these things get connected by gyroscopes which are in the health bands. They tell us things about what is going on and sends the information to a smart phone which calculates things like steps and heart rate and all these other things that are useful for apps that tell us about our exercise history, our fitness and all of these things.

Through the phone we can monitor GPS. We know where we have been and what we have done. Our grocery stores know when we are there and we know what we bought last time and remind us if there are coupons. I know when I drive by any Verizon store in any neighborhood, I get a text message that asks me, are you near a Verizon store? Are you going in? All that information is going into a cloud somewhere and processed out to vendors.

Unfortunately or fortunately, they do not know our name. They would like to. They just know in this case I am a Verizon or Kroger user that happens to be in the neighborhood. They know the rest of the data.

We use the gyroscopes and accelerometers in both phone and the wearable to compare movement and change in direction and all the things that have to do with physical activity. All of that data is constantly being pumped into the clouds and stored somewhere.

It is all out there. We just don't know what to do with it. The next thing we do with data is develop algorithms. What is an algorithm? Algorithms look like this in a very foreign language to people like me, especially those of us who did not do calculus and understand what any of this means.

What an algorithm does is it identifies trends, and patterns and changes and compares

different patterns in certain times. It looks for correlations and puts these kinds of things together so we can see if they are related. If they're useful information and if they can tell us anything about it. When you look at all of this scribble on these slides, that is a lot of work. None of us have the time to do that. What we rely on next is technology. We rely on machine learning or what has been called artificial or augmented intelligence. What is that?

It is simply the ability to train machines to use the algorithms to form humanlike tasks. I recently listened to a podcast and one thing I'm sure I learned one fragment of my neurophysiology training but to hear there is a separate part of our brain that processes wavelengths of light provision and another part that processes color.

It is up to our thinking brain to tell us that is a green leaf on the tree outside of my window. There are three separate things going on that our brain has to tell us so we look out and instantaneously identified that without thinking. There is green grass. There is green leaves. There is a red car passing by. All of those things happen.

Artificial intelligence is the ability to put all of those things together at billions of cycles a second. Machine learning is that part of artificial intelligence that trains a machine how to look through patterns of data. It takes these bulk volumes of data -- billions and billions of bits -- and looks at them and finds patterns and identifies those patterns and looks to see how they correlate and work together.

There is another part of machine learning that is that part of using these huge networks that are many layers are processing units who can look at the heart rate, the location, the activity, time of day and lay are those and find meaning in them.

Again, things you or I would not have time to do in a daily workday world. We had the computer learning things for us in complex ways. They find complex patterns within large amounts of data. Some things you use every day include the images that you see you do a Google search. In speech recognition, especially the kind you do not expect when you are

sitting talking to a colleague about a vacation and you happen to have left your Facebook account or Instagram account open in the background.

The next time you visit those, all of a sudden, you see ads for the vacation spot you spoke about. That is not only speech recognition but content recognition and finding data to present tech content to us. That all happens in milliseconds behind the scene and that is a deep learning part of the whole stratum of augmented intelligence, machine learning and deep learning process that helps us look at things.

What does that mean about treatment? How can that be useful? There are many folks out there looking at different kinds of data that might be useful. Some of the applications that we found and looked at and have been tested in many sites and look at usefulness, we can send surveys.

We can send a simple screen that looks like this and says how do you feel about your recovery? A single answer to that does not really tell us anything about recovery. A lot of times it is easier to say I feel great, especially if they know I have to show this pattern to my therapist and they want to know what is going on.

Over time, it becomes a part of the response that says today is not such a good day. They begin to be more honest in that and more comfortable with it. Eventually, out of that simple survey when the client comes in and says everything is great and fine I'm going to meetings and everything is good. We look at the graph and it says your mood surveys are slumping. What is going on? Tell me about the rest of your life? Or we can ask simple questions like how often do you meet with your sponsor? When do you go to meetings? You learn from the meetings from a simple line of data that is readily available.

We can also do a BAC. There are pocket-size, well tested blood alcohol measures that can be connected to a phone app. You can go to Walgreens or CVS and find the slightly less complex version from what most of the apps I have seen it used. You can do that yourself.

Sometimes just knowing I have that and somebody may ask me to see them is good enough for an alcoholic or someone who is in early alcohol recovery to say not now.

It postpones things. When it is attached to a more complex BAC that schedules them or sends out a random request for them, there is an added layer of not only accountability but connection because we all know that the isolation of addiction and recovery is one of the main harbingers of trying to get into early recovery.

That smart phone becomes an ally and support in the process. We can also look at biometrics. I think most of us know that annoying app that tells us we only made 6000 steps today or in this new Zoom world maybe it's only 2000 steps invokes feelings. It reminds us that there are things we can do that will foster our health on a daily basis.

We know those things are useful and they come from relatively simple measures because we know movements. We talked about the accelerometer. When you turn your phone on its side and it changes the picture. That is an accelerometer and usually there are a couple that measure how the phone is moving as it is moving and make changes to that.

Measuring that and comparing it with location, heart rate in those kinds of things becomes an indicator of movement, exercise, stress and all sorts of things depending on which algorithms are used.

When we talk about gyroscopes, when those are in phones, they are much more sensitive to very small movements across one axis each. They spin one way or another and if you ever played with the gyroscope, you know when the gyroscope is spinning, it resists movement by recording that resistance. We get an electrical current that will guide us in knowing what is happening with the phone.

Whether you know it or not, almost any shopping app that you use measures your accelerometer and gyroscope activity in your phone. It can tell how quickly you are scrolling through things. How long you stay in a particular position and that might be calculated as an

important thing to show you again.

That goes into the algorithm of what Facebook shows you and it is surprise! Look at what showed up today. And defined movements tell us a lot about what is going on in that specific activity in the 30 seconds or one minute we react.

When we look at those, we know there are other instruments that are used in medicine that are very valuable in monitoring people. There are Bluetooth attached blood pressure because they measure blood pressure and record it and keep the data to be sent in and are viewed by a physician.

Most of the over-counter blood pressure cuffs whether around the upper arm or wrist record a series of blood pressures. That is handy. As my blood pressure is normalized due to a whole bunch of things, I have been able to go in and show my primary care provider here is a list of what my blood pressure has been over the last 10 mornings.

Rather than the single blood pressure they get that they can look at it and as a result we have been able to lower the amount of blood pressure medicine I take. That is a valuable piece of information. These are called plethysmographs and graph the change in pressure and that is all they do. Others are attached to apps and the apps can be connected to your doctor's office and provide that information in realtime.

The laser apps measure pulse, respiration, heart rate variability. For a cardiologist, that is information that is important. For a sleep doctor, that information, especially taken during the night during sleep without a complicated sleep evaluation, gives much of the information to know how the CPAP is working. If that sleep disorder diagnosis was accurate or inaccurate and they missed one and all can be monitored with a smartwatch or simple applications that do not have to do much other than communicate with your doctor.

Most of the smartwatch is out today and many health bands monitor blood oxygen and simultaneously the pulse. You have the continuous glucose monitors and the CGM which is

attached and many are attached to a mechanism for injecting insulin. It measures blood sugar and allows doses of adjustment in realtime. It records all of that and most of the CGMs are connected with the endocrinologist or primary care physician to help adjust insulin.

When I was in family medicine residency in the last millennium and rode my tyrannosaurus to work, when my professor said that the discovery of insulin set the treatment of diabetes back by 100 years. What we found today and what I see today is I have no idea how endocrinologists calculate the treatment of blood sugar. It is totally different. Not only do we treat insulin differently but we use a bevy of medications that work on other organs within the body. We see it decrease in the loss of toes and limbs and the loss of kidney function and the loss of vision. Multiple things that were to be expected if one had diabetes in the 1980s and 90s.

These simple changes have brought about revolutions in how we treated diabetes in many other medications. The other thing we use is the GPS. One of the things that is helpful in recovery is if you were to look at my GPS reading, Google weekly sends me a lovely picture of what I have done in the week. I realize how boring my life works.

There is a straight line for my own north of Dallas to my office in Grapevine and back. There are two different ways to get into the area where my home is and that is the only deviation because my grocery store is on the route. My pharmacy is on that route and my favorite restaurants are on that route. It looks like I never go anywhere.

However, if I was early in recovery, somebody may want to look at it and see if I deviated from that. Something was going on. It may be as simple as I went shopping. I needed to buy a new tie for this presentation. You can Zoom in and see exactly where that trip went.

But if I'm going to an area that everybody knows is a high drug area, I need to have a good reason and I need to understand that.

I probably need to offer my recovery program so those things in my peripheral that trigger

those craven responses will be conscious and I will have a plan for dealing with it. This information is readily available. However, to take the time in a session to have somebody bring this up and look at it and ask all of these questions is really not feasible.

Again, but data is not useful. Finding a way to mine that and bring it to us is what most of the folks working in recovery technology are working towards.

When we see these things today, we see things such as the Fitbit, Apple Watch, Garmin watch and the list goes on with many name brands and knockoffs that do much the same thing. We see smart phone apps and Google Health, iHealth, Sleep As Android.

All you do is go into the play store or Apple Play and you will find dozens if you look for health or sleep. You will see a multitude of options for monitoring things like sleep and health and activity and exercise and what they do is they mine the simple things that are readily available and repeat it back full is useful information.

We all use cloud apps on a daily basis. Virtually all of our medical records programs are based in the cloud. When we open that program, it may go through our local server, however, the data is stored wherever. My office medical record is stored in New York.

If I hear on the news that New York is having electrical problems, I can vet my medical record is going to be slow down until I use when the other cloud locations they have. If we use Spotify. If you use Facebook. What is on our phone and computer and pad is small portion of the huge amount of data that it takes to run these programs. Using the cloud and functioning that way is a small part of what the program is.

Therefore, we are using artificial or augmented intelligence every day. When we go to the gas station, not only does that feedback to a specific gas station but it gives information to the providers. I don't know if you use one of the navigation apps but almost all of them now give the opportunity to look for the nearest gas station. There are apps that look for the nearest 12 step meeting of any variety based on your GPS location. That is artificial intelligence at work.

The fact my grocery store knows the top 10 things I buy almost every week and reminds me when they are on sale is artificial intelligence. When we go to the malls, by my GPS location and information given, check in our phone, they know what stores we go into. It is not big brother watching us but simply data in all they do is ask for. They send out to whatever phones are in the area the same message. We interact with artificial intelligence every day.

There is information out there that can be useful. Bringing that into the recovery field is a whole different process. What we have to look at is what can we imagine? That is part of the process I have been able to actually play with in my work with ViviHealth. I have been able to ask these questions. Many times the programmers tell me that I am out of my mind. We are not ready to do that with our current technology or our current budget because it is a very, very complex process to put all of these pieces together. I have learned more about that and I respect that greatly, the work has been put behind these apps and programs.

What if there was a way to tell if they were anxious? Fidgeting because they're having a hard time staying awake? Or just that is their normal state of being? They’re in that part of recovery. I usually say the first five days is a continuous data fidgeting and then somewhere around the tenth day and 20th, they have a recurrent episode and get goofy.

How do I know if that is anxiety or a normal detox process? What if I could find out if there is a trend happening in their mood or in their sleep pattern? Or in their meetings? What if I could make that useful? One of the things we do not have a whole lot of in addiction treatment is the ability to have concrete, observable, measurable information to be able to say look, this graph shows do you are not sleeping well. Or this app tells me even though you are in bed and have your eyes closed and you feel you are asleep, you're not getting restful sleep.

All of the sleep apps on the phone give some indication of REM sleep in deep sleep and light sleep as well as superficial waking which is stage one sleep. In stage one, if you go into it, that is being in a graduate class and you think you are paying attention until your head hit your chest and you realize you draw a crooked line of the page and you have no idea what

the professor is talking about. You are in stage one sleep.

When you are coming from a deeper stage of sleep, you wake up to check your environment for safety, to position your body more comfortably, to make sure you are not going to end up with all sorts of cricks and cramps and other things. Most of the time, we are not aware of it and that is a good part of it. But if we stay in a lot of stage one sleep, it is not restful. We need the good, deeper sleep.

What if you knew the attendance in meetings and the time spent both in and after meeting is decreasing? Early on in recovery, people find meetings irritating at first but then they begin to hear things that are useful. In that process, they began to get excited about going to a meeting. They hang around, have another cup of coffee or go down to the local grill and sit and have a snack and coffee or dinner if they did not eat before the meeting. They visit.

It is a good thing. It becomes a part of their life. It becomes something they are looking for. We also know that when recovery begins to slip, those meetings after the meeting, those social times that become a part of recovery and are so essential begin to slow down. They begin to be less important.

If we could see that trend rather than getting the checkbox that I went to the meeting. And what did you do after the meeting? I stood around talking to people and then I went home because I had work to do and homework and dishes to wash or something that many times our hunch is that is a nice try at a lame excuse. But we don't have any proof or anything measurable to go with it.

What if I was to know in group they were being triggered and not aware of it? That maybe they think they're tired of listening to Joe talk about his last relapse? And what looks like just being fed up is really that little person of addiction on their shoulder is saying you see? It is not going to work. That is the beginning of a trigger cascade. Who is going to interrupt group and say I think I am being triggered?

If we could have an understanding of that, if we could have a way to look back at it and say that was a difficult group for you. Can you tell me what was going on? Even a couple of days later, we have observable information if we have data handed to us with an explanation of what it means. We do not have to understand deep and restful sleep in REM sleep in order to know those numbers are higher in our sleep at. We feel more rested.

And just like people treating people in recovery, we do not have to really understand the data if it is presented to us in a way we can say this means something. And begin to teach that piece of it. One of the downsides of the sleep app is I have noticed I am sensitive to those times when it tells me I did not sleep very well. I may wake up bright and cheerful and singing with the bluebirds and all of a sudden when I look at the report that it sends me, I'm aware being more tired than I thought I was.

Then I have to look at that and make a choice about which one I'm going to believe. What if we had an advance warning of relapse? I would like to show you examples of things I have gotten out of my private practice from other resources. This is one of my favorites. This is Charlie. He was in his early 50s when for some reason he decided it was a good idea to use methamphetamine.

He came to see me 11 months into his bender. To give you a perspective of where Charlie is, if you've heard about the crash of the software for major airlines across the country, Charlie was one of the five people in charge of the team that got that back up and running within 12 hours.

He has functioned through his relapses and through this period of using without losing any of his bonuses, without anybody questioning his behavior. He is a pretty good actor. Well about a month -- once we got his feet on the ground and I was seeing him on a regular basis, he was still relapsing about every seven days. This comes from a Fitbit.

What it tells us is his basal heart rate, this is a heart rate taken at the lowest point during

sleep, during REM sleep. Each night, it records what his lowest heart rate was. I guess it is obvious when he used which was right before the top of each of these peaks. He had records of those and they matched. What we talked about was looking at this information and making it useful.

He did that and he came back about a month later with this. This was about three months later because this is thirty-day monitoring. There are two important things here. This period of time was the end of a period of taking five or seven different databases for a major airline and consolidating them into one single database and getting that transferred out to their seven redundant databases.

This was a very stressful period and this was the day they flipped the switch and made everything happen. This is an indicator of stress. Life was fine. When he is on his game and gets out to seven months of sobriety, this number drops to 53-56 down here. But there is a gradual increase here.

As an engineer would, he writes down what he is doing every day. This was a particularly difficult day in terms of meetings, external stressors, the quality of the sleep. He went out and used. What we see there is that we know what stress looks like. This is how he handles stress which is not bad for somebody in his mid-50s. We also get to see the warning or relapse.

He had seven clear days where his resting pulse was about 60. From that, he decided there was an impact. There was a lot going on and he put together a pattern that when his pulse gets above 63, he changes what he does. He gets more defined in his sleep pattern. He goes to bed at a particular time. He has a sleep plan he uses. He does scheduled meditation. When he gets above 65, he cancels at least one meeting for the next three days.

He doubles his contact with his sponsor. He spends his evenings with one of his three children each night. From that, we got him out to approximately 7 1/2-8 months and then

Covid hit. That had a definite impact on how he practiced these things. Not only the stress. But what we see here is such a dramatic difference and a great warning indicator. The advantage of this is he did all the work.

He came in having identified this, having monitored it and tested it and had an action and answer plan. All I had to do was remind some of that and have him send me his weekly basal heart rate. That has worked and he had a couple of relapses. They have been one day and he's usually back on track within a week and his basal heart rate is back in the lower to mid 50s.

We can have a warning if we understand the individual and they understand himself enough to begin to see how to intervene. We do not have that very much.

When we look at some data that can be obtained from some of the apps, we look at activity and events. I believe each one of these is an insight. Something that is sent out in a text message that says hey, this is what is going on. These are activity levels. There is not a particular pattern here.

When we combine these with the sleep pattern in the mood and affect survey this program is using, what we see is there is a big gap here. These are missed blood alcohol close. We see this increases in frequency and about the time the mood is decreasing, the negative side of this test is increasing and the positive side is decreasing.

All of a sudden, there is a period where there is not much happening. Even the artificial intelligence cannot find something to put in here that might boost the things that are being monitored and say this is what you need to do now. This was a point at which therapists came on board and put interventions in and got back to meetings. These were more frequent and positive. If we were able to look at them, the basic insights were much more positive and we showed an improvement. When this happens again, we have a much more abrupt decrease but also have a short period of time in the slump and much more rapid return.

There are things that work before that can be re-added at this time. We see each of these things put together with a very critical in-depth which this was more than likely a positive blood alcohol test. That puts together the answer of what to do as a therapist. It gives us observable and measurable impact of sleep because you see one that goes away and we have an indicator that the app is being used and likely it is attached to a health plan that is also in place because we see the activity there.

It is the other things we need to look at. Any one of these are not a good predictor. But when you put them all together, it tells us what to do. It is actionable information. Intervening on the whole dynamic of the process of relapse or recurrence.

What if you had advanced warning? Here we see a missed night of sleep. It is not followed by a nice -- what is going on here is the height indicates the length of sleep and the breadth is the quality of sleep. Things are going well for a couple of days after that and then they start to decline. So does the quality and duration of sleep.

Mood slumps. The indicators here decrease. There is not much feedback. My hunch is that there are more negative events going on. We begin to see the correlation of the two. Just with this information, we can look for other things and we see in the middle was a missed meeting. When the rest of this time is pretty clear attendance in meetings. There is an actionable thing we can look at.

We can see how the three factors come into play. We know to suggest to committing to and attending meetings. That also implies some accountability and I usually suggest you report to your primary support or therapist before and after the meetings. Commit to going to sleep at a regular time. One of the things I have learned, I have a sleep at from Beauty Rest attached to my bed. I have learned clearly my quality of sleep decreases dramatically if my head hits the pillow at 11:00 instead of 10:30. I thought it was silly for started coming up but I found it is consistent that sleep time and the duration are deeply related to the quality of sleep.

Looking for more advanced warning. This is my usual pattern. It is an example I will pair with one that is an indicator of relapse from somebody else. What you see here is home, work. This is an entire week of travel. This is what my life looks like. It is not real exciting.

I changed it to be mine and went through a similar pattern. This is what happened with an addict in my care. He lives a little further north on this and I wanted to protect his identity when I drove this. He goes the same route and comes to my office and then goes back. We have checked this before.

I know this. Then he had a really difficult week and kind of squirrely about what was going on. When we pulled this up and looked at it together, we see from my office, there is a side trip. He tells me this address is a business he has to go to get something specific for his work and in the defensiveness, because he knows we do this, he brought the invoices. He was telling me he was verifying the truth.

Unfortunately, he also knew he had shown me this area of town is where he frequently met a dealer. His excuse was that his favorite Chinese buffet was there. It was one of the few that restricted its service but continued to be open through the last half of Covid pandemic. It was someplace he referred to regularly.

However, you notice he goes home a very different way. He went somewhat out of his way. I know this path at certain times of the day is a good bit faster. We can also look at the time of day for this and that was not the case. It tells us his location, his timing and thinking did not match.

It gave us information in terms of relapse dynamic. The suggestion was when you have to go to purchase this supply, bookend it. Place a call and someone in your support system and tell them you're headed there and you call them when you leave there and you will call when you get home. It is very simple.It can be done with a text message or call and it is very simple to get the good feeling that says I don't have anything to cover up.

I don't have any problem because I have accountability. If there's anything functional about having a designated circle of supporters, I have an exercise called the fire drill where they list three phone numbers. When they feel triggered, have anticipated stress, and in all family gatherings or whatever, they have three people they call before. When they get triggered, have a list of three things they recite. It can be poems, sayings or paragraphs from the big book.

It can be whatever brings them back to the spirituality center. If they are still feeling bad, there are three phone numbers written down for three different supports. If that does not work, they have at home, at work and in their car, copies of segments to read whether it is the extended version of the prayer of St. Francis or how it works or several paragraphs from the big book. I have an actual copy so they have it where they are in their life.

They carry that with them and they have the reminder that I have this circle of friends that are a part of my life and help me stay in recovery. Plus, they have at the bottom a reminder or their therapist's number. We all know when it is in a crisis and they could reach out if they forgot how they listed my number in their phone contacts. It is time to do something different.

What if we all knew? This is a mockup of a page from one of the applications that functions for a clinic. Each client or patient has their own page and it has all of these bits of information and in the ViviHealth app there is a composite score that takes things into account and measures engagement. That is meeting attendance not regularity of sleep and interaction with sleep. It gives a quick read of what's going on and some of the vital statistics and through calculating that, it gives a list of indication of risk.

The big alert is there was a BAC failure and the blood alcohol was .062. All of that is in one place on their triage page that lists all of the clients. At the end of the day you can look at these things. This is much like a medical record and as a physician I know it is useful. Even if it's for the new patients are ones that do not have a progress note in so many days are ones that have to sign off having it is the first place a screen comes up guides me to know what is

the severity of what they need is today and what I need to do in terms of taking action.

It helps me to guide my day and move forward. When we get these bits of information, I am led into action into what I might do is the next steps. The next challenge for all of the companies that are putting these together is to be able to further distill the data, to further program the algorithms and machine learning to be able to associate what changes in data can be useful and what changes really do not impact the ability to move forward in recovery.

The next step will be testing these kinds of things in a recovery situation. I have shown you there are some things that you can do within your practice that are very simple that you can ask the patient to share with you. They maintain control of it. You learn lots of things with the information they have.

At this point, I would like to be open to questions and to clarify whatever. I will turn back over to Jesse and I will stay around to answer questions.

>> JESSICA O'BRIEN: We have quite a few for you.?

>> DR. JES MONTGOMERY: There is room for both of us.

>> JESSICA O'BRIEN: I will pull up the Q&A box. First question, if you want to look at the questions and upload and you see, feel free. The first question is what are the financial costs of the client and taking part of this equipment? What about underserved communities that may not have the right access to technology?

>> DR. JES MONTGOMERY: Most of the apps are in start up processes and they’re basic. Some are available free and do some of the rudimentary data. Some of the more complex ones are reaching out to clinics. And working with clinics to make the cost as prohibitive as possible so we can begin to learn from them.

And there are apps buried into other monitoring programs that may be not as cost prohibitive but stretch it for folks in other areas. One of the pilots we are doing in ViviHealth is working

with inner-city, underprivileged population. The University medical school overseeing that is working with us to make that a pilot site.

We are very much aware and the other companies are very aware this is something that could be out of the reach of many people and we need to find a way to make it available to as many people as possible. Many of the basic apps are available online for free. They may not have the health band or bells and whistles or connection to things but it is easy to look at the apps and find information about how to look at your iPhone or iPad and iWatch or Fitbit and find other information that can be useful.

>> JESSICA O'BRIEN: This question comes up a lot in this technology series. What are other apps in addition to ViviHealth? Is there a unified name for the apps or a list or rating system?

>> DR. JES MONTGOMERY: I am not aware of a focused list or rating system yet. That is one of the things I did not do beforehand. I did not look for that hashtags or tags that come up with ViviHealth that might be familiar. I would venture to say most will be listed under monitoring or recovery apps.

There are several in that field. Most treatment centers when we talked to them have tried or listened to the spiel from several other programs and they know a lot of the names. A majority of them if you look for a health app, it can give you a lot of that information automatically. It is a little bit of calculation.

>> JESSICA O'BRIEN: Have you seen app use and data collection like this impact the therapeutic relationship or how have you seen it impacted?

>> DR. JES MONTGOMERY: The one I have known from the private practice have definitely made a difference. The reports at ViviHealth we get with our test pilots, our pilots have been very positive. We are finding ways of making it much more consolidated, much more available. And guiding us in the next layer of programming for our app and the related apps that go with it.

>> JESSICA O'BRIEN: How do we determine the best kind of data to gather and implement with the patient? Are some forms that work better with specific patients than others?

>> DR. JES MONTGOMERY: There are two directions to go with that. In looking at specific apps, to look at feasibility. It has to be workable for you. I also think the other approach is just as viable. I have probably got almost a dozen patients who once or twice a month or weekly send me their sleep scores or send me -- most of the physician health program patients I am monitoring with them and have gone to electronic meeting attendance and I get a copy of that.

There are individual pieces you can look at. Takes time and finding out what is the patient sensitive to? If the patient is missing meetings, then they can voluntarily go in and put in location on Google of their favorite meeting that they commit to go to regulate and when they pull up their weekly travel circle, it will show up.

When they were there and how much time. Usually, it is composite that can be broken into a daily thing. If someone is having difficulty with sleep, you can pick any of the sleep apps that work. They can work just with the phone or work with a health band. There is a little bit of clinical work in terms of finding what might work best for the patient. And beginning to explore that from the beginning while the apps are moving forward in their development and become as available as they will be over time.

When we began the venture with ViviHealth almost five years ago, the equipment we had available was nowhere near where we are today. Most of those changes have happened in the last three years. At that speed, the availability of information and hopefully the availability to obtain information from almost any wearable will begin to surface as the need arises and the demand goes out to the producers.

>> JESSICA O'BRIEN: A follow-up to that. In terms of types of clients of what works for different clients, it seems this relies a lot on client transparency and willingness to be

transparent. I am thinking it applies more to more motivated, later stage of change clients. What about people in the earlier stage of change? How do you motivate them to participate in something like this?

>> DR. JES MONTGOMERY: It is multi-staged. People in the pre-contemplated stage may respond well to say this is going to tell you some things about what you are doing that may not be working. Even if it is you forget to wear the watch every day, that says something that where you are in your decision about recovery.

The accountability part of it is one of those things -- I remember in working in a residential program where a group of medical professionals had gone to a meeting and decided to stop by the grocery store and a quick run back to the hospital. And by luck, one of the techs was going to the grocery store to pick up Gatorade for a patient. They got busted. And relying on that is not viable.

To give those sit with somebody and say if you like the typical early person in recovery, you are going to make mistakes. All this does is show me what kind mistakes you make and how to give you the tools. If you cannot remember to wear the wearable, then maybe we can set up a reminder. Maybe we can find something to work to boost you.

People who are in later stages of change usually latch onto it because they have begun to identify their own stumbling blocks and they will say I need help remembering meetings. I need help with when I have to travel and those kinds of things. It is pretty individual. All I can say is it sure beats seeing the person for the first time and hoping they will come back.

The other thing we do get to count on is no reasonable act or person will give away their smart phone. It can be stolen but they will hang onto it and get it replaced pretty quickly. We sell that as a tool. You already carry in this. You are already providing information to Google or Apple or whatever. Let's let it work in your favor.

>> JESSICA O'BRIEN: Along the lines of discussing about app consistent user motivation,

how long does monitoring need to take place consistently to find the data reliable?

>> DR. JES MONTGOMERY: I can tell you what we have learned is usually within about three weeks of somebody new coming into the program, we are identifying things we need to focus on more clearly. It is a very rapid process of looking at the data and beginning to figure out how to digest that and turn it into something useful.

That is a pretty quick thing. Their programming process is the slow piece. Learning how to get that into the app and make sure we tested the algorithm and all of that is not quite as quick. What we know is the more data we get, the more streams of data coming in because of the more likely the algorithms are to pick up things that we need to look at.

>> JESSICA O'BRIEN: And do the algorithms have warnings pop up?

>> DR. JES MONTGOMERY: Yes.

>> JESSICA O'BRIEN: Notifications? Got it.

>> DR. JES MONTGOMERY: Mine tells me regularly I do not move around enough.

>> JESSICA O'BRIEN: You need to stand up. What do you think is coming down the pike for this type of information integration?

>> DR. JES MONTGOMERY: Our hope is we will integrate this into all levels of treatment. From detox to post treatment or outpatient long-term recovery. My sincere wish is we get enough people following out to 3-5 years that we will have objective data about recovery rates.

We all know statistics in substance use are based on patient reports. Sending out a questionnaire, making phone calls to get a 30% response is usually considered adequate. We are missing the bulk of people.

If we can get this to be not only more generally tailored to different individuals and different

processes but also getting to be where it is just an everyday thing, it only shows you what might be improved or might need improvement or congratulates you want something new that did work.

When there is a stressful situation, it can flag and say this is the YouTube video for the podcast you listened to the last time you look like this. Would you like to do it now? It offers an answer. Those are much more complex steps that will take time with an individual. The goal is find out what really works in treatment and how to fine-tune it for the individual. So we really do have individualized treatment that changes with the patient that maybe identifies their state of change and the different things that we look at. We basically guess at.

>> JESSICA O'BRIEN: That is great to hear the long-term vision. I want to almost close with that but there is one more question. What kind of agreements are in place between the patient and therapist to prevent somebody from leaving their wearables or whatever at home?

>> DR. JES MONTGOMERY: As far as leaving them, it does signal and gives you a message that you seem to be away from your wearable or your wearable is not registering. The general message like that. On the patient triage page, each patient has a little signal that says wearable being worn or not. As a therapist if I look at it, I know that it is not functioning.

Or somebody who is using the blood alcohol measurer, I can send out a signal for them to do a BAC within the next 30 minutes. That functions as a reminder they are connected. There are confidentiality agreements that protect the data between the patient and therapist. Within our databases there are three levels of encryption that separate front end and back end baseplate of the app. At its core, we cannot make them wear it. We can only have the discussion much like I have with my psychiatric patients.

How do you think that medicine is going to work if you do not take it?

>> JESSICA O'BRIEN: Yeah. Just not wearing in and of itself is an area to explore an intervention. We got through all of the questions which is wonderful. Thank you so much. It

has been wonderful. So helpful. Chris was in the background answering questions. If people wondered what the plural was. Very appreciative and so much good information.

And if people want to learn more about ViviHealth in particular, I think we have the information. If we do not, we can get it for people. Maybe Chris can put it in the chat box. It sounds like a great tool. Thank you so much. Hopefully, everyone can see my site. If you want to slip in a few more questions while I'm wrapping up for Dr. Montgomery or Chris, he's in the Q&A box answered.

Upcoming webinars to be aware of. August 18 we have "The Addiction Professionals Mini Guide to SBIRT for Adolescents" with Brett Harris and Carlo DiClemente. That will be exciting.

[Reading slide]

A reminder our annual conference is October 28-30. We are currently offering an early bird special if September 15 and save up to $151. Hopefully, we will see you there. It is exciting and we had a successful virtual one last year and this one will be virtual as well. We are offering this year three days of preconference events.

At our live conferences, we have preconference days and this is mimicking that. We have three October 8, October 15, October 22nd. Each day we offer different opportunities to learn. You get six CEs and they will be available on demand and you can take them all if you like. Hopefully, you will check those out.

I mentioned our LGBTQ care series. We've done the first two and the third one is August 20th and the fourth one is Friday, September 17 and on demand if you have not checked them out. It is valuable information and engaging content. I hope you can join us or check them out on demand.

We have a wellness and recovery in the addiction profession specialty online training series. It wrapped up in June and available on demand and there is good supplemental recovery

tools and practices available to learn about and including ballroom dancing. Check that out.

And a reminder of the benefits of being a member of NAADAC. I will say my favorite easy access to free CEs. It quickly pays off your membership dues by attending a couple of webinars and getting CEs. Many of us need those and want those and I recommend checking it out.

Thank you for being here and thank you Dr. Montgomery and everyone in attendance. We hope to see you again soon and wish you all the best and a wonderful weekend. Take care.

[END]