Introduction to GABA and the episode guest

We often hear about dopamine, dopamine fasting, serotonin, epinephrine, norepinephrin, but GABA actually is the unsung hero because it actually calms down the firing of the brain.

Without the GABE system around, you cannot calm down. The brain's firing and GAB has this amazing interconnection with all these other neurotransmitter systems that I was just mentioning to actually regulate the flow of information and firing that's coming from some of those superstar neurotransmitters that I mentioned.

Welcome back to this episode of the Think Well, Age Well podcast. I'm your host, Dr. Heather Sandison. Today, I am thrilled to welcome Dr Scott Sher. He is a board-certified internal medicine physician and one of world's leading experts in health optimization and hyperbaric oxygen therapy.

He serves as the COO of Troscriptions, a company known for creating precision-dosed buccal trochees that focus on energy, stress resilience, and cognitive function.

He's the VP of Health Optimization Medicine and Practice, health rather than just treat disease. He's also the chief medical officer at OneBase Health, which is a developing next generation integrative technologies that include hyperbaric oxygen chambers, sauna systems, and red light therapies.

I am so excited to dive into this conversation because as you can see, I've brought Dr. Scherer here to really dive in to some of these cutting edge approaches to optimizing health.

Today, we're going to really get into a fascinating topic around the GABA system. This is the breaks of the brain, if you will, and we are going talk about why so many people today are stuck in the sympathetic overdrive and how we can help to replete, rebalance, this system, what that means for mental clarity specifically, resilience, and then, of course, healthy aging.

And I will start the conversation by sharing my personal experience. I met Dr. Cher at a conference at my naturopathic conferences last summer. And I was going through a particularly stressful period.

My clinic had flooded. Our clinic here in San Diego had gone through this horrible flood after a pipe burst, and I hadn't gotten a full night of sleep in weeks.

And the Friday before I went to the conference, I got the call that, in fact, now there was a bunch of mold in the clinic. It was gonna take even longer to get the mold out, resolve that.

We have mold-sensitive patients. I just was sort of in a panic. Saturday, I met Dr. Cher and he showed me these trokies, something that you put between your gum and your cheek and let it dissolve and it could help me with my sleep.

That next morning, and I was a little scared taking it that night, like, what is this going to do? Am I going be groggy the next day when I want to be present at the conference?

And lo and behold, got a phenomenal night of sleep, woke up feeling more rested than I had in, of course, several weeks. And it really has helped me get through a particularly stressful summer.

So in all of my emails, I sign off saying, thank you, Scott, for the great sleeve. And I've also turned other patients onto this now. That's why a big part of why I want Dr.

Sher to share here today is because I think this is an underutilized mechanism of delivering medicine. Dr Sher,

welcome and thank for joining us. It was my pleasure to be here, Heather.

And I remember you very well at the booth actually, because I could tell you were having a bit of a challenging time. It wasn't an easy conference for you to get to.

I didn't know why at that time, but I member you taking the product and then the next morning it was just like your nervous system had completely reset.

I haven't slept that well in such a long time. And I was like, perfect. Like then that's uncommon to get good sleep at a conference at all, because you're at conference, you are under bad lighting all day.

You're going and checking out all the booths and all their products and you don't really know what you were taking by the end of the day and so it could be very overstimulating.

So to see that kind of nervous system reset that I saw with you was, was a beautiful thing. And I was so grateful for it. So let's break it down for those who aren't familiar.

What happened was we turned on my GABA system, so I able to rest and recover. So the GABA system is really actually the unsung hero in the brain. We often hear about dopamine, dopamine fasting, serotonin, epinephrine, norepinephrin, but GAB actually is the un-sung hero because it actually calms down the firing of the.

without the GABA system around, you cannot calm down the brain's firing.

Heather's experience with Troscriptions and nervous system reset

And GAB has this amazing interconnection with all these other neurotransmitter systems that I was just mentioning to actually regulate the flow of information and firing that's coming from the, some of those superstar neurottransmitters that.

I mentioned earlier, it's called an interneuron. Actually it actually stays in between. these kinds of bigger neurons, sometimes the neuro epinephrine neurons that the dopamine neurons.

It helps regulate the firing. And it's also a sensory gate, which means that it helps gate information that's coming from the outside world so that we don't get overloaded.

Now, if you go to room and you actually were trying to process all the information of what's happening in the room, the colors of the wallpaper, their floors, that.

The smell, this sounds, it can be very overwhelming and the GABA system helps you regulate that information so you can actually. process information and actually be able to filter out what you don't need.

So you actually can focus and do what do you need to do. And so the problem though, Heather, and I think you know, this is that there's so many of us now that are GABA deficient.

Our GAB systems aren't working at the way that they're supposed to. When you're GAFA deficien, you have increased risk of anxiety, of depression, insomnia, tremors of other medical illness as well.

That GABA system is regulating all of that flow. And a good example of this is your thought generator, your brain. Your brain on average makes about 70,000 thoughts per day.

That's a lot of thoughts. Doesn't mean every single thought there is unique. In fact, if you're anxious or depressed, many of those thoughts are going to be around the same thing as either being anxiety, having anxiety or having depression.

or feeling depressed. Um, and then if you're feeling anxious and depressed, that thought generator can go up to

about 120,000 thoughts per day. And so what I always say in correspondence to this fun fact, if want to call it that is that we shouldn't believe everything we think, right?

If you have 70,00 thoughts. That doesn't mean we should be thinking about all those thoughts and thinking that they're actually true. And I have kids and we all often talk about this thought generator and how it can kind of go crazy on you and thinking about going down all these different rabbit holes.

Right. But if a very difficult time, GABA system is dysregulated. And once you can get back, you get that GAB system back online, then you could start being able to regulate your thoughts better, or at least you're not generating 120,000 thoughts or generating like 70,00 thoughts.

And what's also really important is that we have another neurotransmitter in the brain that is also pretty unsung in a way that it's really, it is not only talked about a lot.

It's called glutamate. Glutamates is actually our primary excitatory neurotansmitters in our brain. And glutamine gets converted into GABA in And it requires vitamin B6 and magnesium to do this.

And so if you don't have enough GABA, but you have a lot of glutamate instead, you're going to get these sort of, glutamine toxicity kind of symptoms, which is this overstimulation that I've been just describing.

So as clinicians, many of us aren't thinking about GAB deficiency when somebody comes in the office. If they come with anxiety, they'd come in with depression.

We're thinking maybe about other kinds of things. You know, if your a conventional doc, your thinking of putting them on, and anti-anxiety medication, maybe, which actually is GABAergic, interestingly enough, although doctors don't really understand why they're doing that.

And then, or conventional docs at least, and then you have people that are depressed that come in and get SSRIs, right? And we now know from multiple meta-analyses that depression is not a serotonin deficiency.

When I was in training, that's what I learned. I learn that people with depression had lower seratonin levels, but actually that not true. It's actually the same amount of serotonin in somebody that's depressed versus not depressed, but there are actually very good studies showing that depression is actually associated with low GABA levels as well.

And so actually, the newest drug on the market for depression actually for postpartum depression, is a GAB-ergic drug that works directly in the GABO system.

It doesn't take four or eight weeks to work. it works immediately. High level for those that are listening is that GABA is the brakes of our brain. And if we're GABE deficient, we can't put those brakes on and then we get stuck in this sort of spiral where we are in over activation, this sympathetic overdrive, that fight or flight nervous system that just can shut off.

And I think people aren't maybe familiar with GABA from a medical perspective, but a lot of people have experienced these GAB-ergic substances, right?

Like alcohol. They have. And potentially benzodiazepines, the anxiolytic medications that they might have been prescribed. Those can be actually dangerous.

The only addictions that can kill us if we stop cold turkey are benzos and alcohols. You know, on this spectrum of GABA interventions, talk us through where, like the trust prescriptions product that I took, where is this on the continuum?

Do we need to be concerned about addiction, about habituation? Sure. Talk us though that. It's a wonderful question and it's really important because most people love modulating the GABA system with things like alcohol

and benzos and sleep drugs, because why?

They make you feel good or they make go to bed. The problem with alcohol, the benzo's and the sleep drug, but especially alcohol. And the Benzo is, is that they bind very tightly to the receptor, The GAB receptor.

So when you send me buying something very highly to their receptor it's called an allosteric site. It's a separate site where alcohol binds or the benzos bind and that separate side where it increases the affinity for that GABA neurotransmitter to bind to the receptor.

The problem with alcohol and benzo is it binds so tightly to.

How GABA calms the brain and filters information

And then it requires so much GABAA to find as a result of that, that it causes this. feedback loop in the brain or in, in their receptor to actually try to modulate how many receptors are available so that it doesn't have that flood of GABA that's happening.

And then over time, you need more GAba. We need benzodiazepines. You need alcohol to get the same effect. over time, you have less reserve. And so what happens is when you, if you stop those drugs, cold turkey, get this rebound effect where you can't get enough GABA to bind.

You have a huge amount of glutamate in correspondence, which is that primary excitatory neurotransmitter. That's when we get these, what we call the withdrawals of alcohol and benzos that can be deadly and cause a hemodynamic instability.

So your blood pressure can go crazy. Your heart rate can get crazy, you can start getting what are called DTs, delirium tremens, where you actually get hallucinations.

And you know, I've seen this, countless and countless of times. You have to be really careful about how you modulate the GABA receptor. A good question that I always get asked is, well, can I take GABAA itself?

The problem is that GAbA itself is too big of a molecule to get into the brain. If you take a GAba supplement, And it works for you. If it's a pure GABA supplement often means, unfortunately, that you have a blood brain barrier that is leaking things inside the brain that shouldn't get in there.

We call that having a leaky brain. Now it sounds scary and it, you know, it kind of is, but it usually is correlated with a leaking gut. And so if you optimize somebody's gut and make it so that the guts not, You know leaking and inflamed, typically will take care of the blood, brain, barrier at the same time.

I've had patients over the years where. They come in and they're actually GABA supplements are working for them. And then we optimize their gut function and the GAFA supplements stop working.

and this is, you know, diagnostic for a, like a leaky blood brain barrier. So GAVA supplements should not work for you. If you're taking your pure GAPA supplement.

Now, the only maybe caveats to that would be if it's a very, very high dose of GAB of like two or three grams of Gaba, some of that might get in just because of the sheer amount that you were taking.

Then there are some potential. possibilities with that natoliposomal like a very small liposome would be able to get in through the blood brain barrier, as opposed to the regular gap of supplements.

But what, what I think about here, Heather, is like, it's kind of like two pronged approach, right? When you, when you have somebody that's GABA deficient, you want to be supporting the system, optimizing vitamins, minerals, nutrients, gut health, understanding why they might have a lot of stress or exposures that are causing stress, right?

This could be a bad relationship. This can be even, you know, trauma when somebody was a child, for example, that, and they never feel safe and have always been in fight or flight, since, whenever, Right?

And so there's a lot of different reasons as to why, but the challenge with all this is like, I can, send people to therapists like we can do or to the jungle in Peru, whatever is required, That takes a while to work.

And the question is, well, how can you really down-regulate that nervous system now and improve GABA levels? And so the way I think about this and the, we think this at Transcriptions is that we want to modulate the GABASystem in the most comprehensively supportive way possible.

And so what we do there is think about, well, if you're going to give something that's going bind to the GABA receptor, you better also give some GAba or something like GABa that it's gonna bind, to where GAB would bind so that you don't deplete GAbA in the process and cause a risk of tolerance and dependence and withdrawal if stop it immediately.

And, so there's a lot of great compounds that actually are very, that are natural that bind totally separate sites on the GABA molecule, GABC receptor excuse me, that are not as dangerous as alcohol and benzodiazepines.

There's a couple of those that I like. One is called kava, the kawa plant. Kava binds to a separate site. That's also very good. This also, there's some cannabinoids that non-psychoactive like CBD, CBG, CBN, really all the non psychoactive cannibinoid bind to separate sites on the GABA receptor.

They also bind other receptors like the, and the endocannabinioid system, they bind the serotonin system as well, but they also buy into on GAB a receptor and then you also have.

Other, other compounds as well that I like, things like Hanokial from Magnolia bark is another one that. There's also Valerian, which binds to a separate site that's.

That's all good. Right. But if you're a kava drinker, if I've never really had a lot of Kava drinking in my personal experience, but I know Kaba drinkers, they will notice that over time they do need more to get the same effect.

And that because even though it's not as. tightly bound to the receptor as alcohol or benzos, it does deplete GABA over time. And so what we do with transcriptions, we add something that goes indirectly through the blood brain barrier, and then it binds to where GABO would bind on the.

So for our COM product, or it's our calming product called TROCOM, We have something called nicotinol or vitamin B3 attached to a GAB. And that vitamin B3 has a transporter that gets across the blood-brain barrier, takes GABA with it, and then it breaks up or hydrolyzes into B 3 and GAba.

So the GABa goes to where GAB would be binding on the receptor, which is what we've been talking about. And then interestingly enough, the B three there, vitamin b3 is actually mildly activating.

turning into NAD in the brain. And that's good because you can get this anxiolytic effect, this relaxing of that anxiety effect. But you don't have the sedative effect that you would typically get from benzos or even alcohol, if you have a little bit too much of it.

Right. So that how we kind of paired there. Then we have sleep product called Trozik. that combines the Hanokyol, depending on how you like to say it, from Magnolia bark that binds to the separate site on the receptor, along with something called agarin.

And agarin binds directly to where GABA would bind on their receptor. Agarins from a psychedelic mushroom called the Amanita muscaria mushroom, or the fly ageric mushrooms.

It's the beautiful mushroom with a red cap and white spots. People have seen this, if you've actually watched Alice in Wonderland or Mario brothers, or if you like Christmas, which many people do, there's tons of mushrooms

around Christmas.

And there is actually a lot of lore around these mushrooms as being part of the Christmas mythology, actually. It's, and if anybody's interested, go to New York times and type in Amanita Christmas and you might be shocked actually, because this mushroom.

It has a psychedelic mushroom, not like the psychedelics mushroom like psilocybin, it's a little bit different than that. It doesn't give you like hugely visual experiences.

Typically it has another ingredient in the mushroom called hypotenic acid, which is neurotoxic. And so that was typically gives them more visual experience, but the agarins more of a long acting on that GABA receptor.

So the way we think about. that sleep product is that you're combining those two things together so that if you are enhancing the amount of GABA to bind, that your not depleting GAB at the same time, these are giving something that can work just like GAbA on the receptor.

And I want to be clear to our listeners, you aren't suggesting taking a psychedelic with the trochies here. There's a compound that supports sleep that's in there that happens to come from a psychadelic mushroom.

Glutamate, GABA deficiency, and anxiety

Right. It's not psychedelic at low doses either. Not at all psychedelics. Okay. No, no, it just has an interesting origin, but the compound itself is not psychodelic and is very safe at lower doses.

And so we combined these two pieces together. We call it an obligate pair, which is a fancy way of saying that pairing two compounds together that are really comprehensively supporting the GABA system.

And by doing that, you can get fantastic anxiolytic or sleep support without having any risk of potential dependence, tolerance, or withdrawal over the longterm.

So the delivery is also really unique here in that it's this trochee, right? It's a small amount that you put, it is not in a capsule, and you can put it between your gum and your cheek.

And I want to talk through just the physiology there. But one of the reasons why I'm so drawn to this is because I, for one, don't love swallowing supplements.

To have many patients who that becomes the bottleneck is they just don't want to swallow more pills, and particularly if it's more water before bed and they have struggles with their prostate or with getting up at night to urinate.

If you're struggling to fall asleep, having that in your bedside table and putting a trochee in is a really simple way you can do it without even turning on the light.

right, to get the benefits of this. And you have other, you know, non-sleep support trokies as well, but let's just talk through how the trokey itself works and why you chose this as the delivery mechanism.

The buccal turkey is fantastic and the way we describe it is it's a dissolvable lozenge that goes between your upper cheek and gum. And what's nice about the delivery method being up here is that you have about eight layers of mucosa up there.

So we designed it so that it was a slow release formulation over about 15 to 30 minutes. up into that upper cheek. And what's really great about this is area and then multiple things as a result of this, is that you have fast acting.

So it doesn't have to go through digestion. It doesn' have go to your stomach, your small intestine, and your liver. it just goes directly into circulation, which is much faster.

It's also going to be more bioavailable, which means that the ingredients, when they get digested, go through your stomach, small intestine and liver.

They get often less bio-availability, get less active. And so you prevent that from happening. Some of the studies are pretty significant. We should at least 20X more potent staying in the mouth compared to being swallowed.

I always give the example of something like NAC and acetylcysteine, Which is only 10% bio available. If you take it as a supplement, if you it orally and you'd take a hundred milligrams, you're only getting 10 milligrams in So we know that from our research that we've, we have chosen compounds that maintain their bioavailability in the mouth.

They have to be water soluble. It was kind of the big thing. And as long as they're water-soluble, they can get through into the buccal mucosa and be much faster acting and more bio-available.

Then the nice thing additionally about the trochees is that they are scored. So you have like a little line or a cross in. In the middle where you can actually take a quarter of it or half, three quarters full.

You can really dial in your dosing. That's one of my big. know, tiffs with, with capsules oftentimes is that if you have a, you, have, a very sensitive patient and it comes in a 250 milligram capsule and like, You know that they're likely going to not do well at that dose because they don't ever do good, do, well, at the lower doses, it's almost impossible to open up that capsule.

And try to figure out how much they take. It's a thing, right? And so I've been, this is kind of my own personal experience over the years. I'm always like the sensitive one.

You know, we were talking about nicotine patches before we got online and we'll talk about this, I am sure. But like, tend to have a very low need for these kinds of things.

And, so the choke is really nice for that is you can titrate it to find the exact dose that you need. and then that can also change, if you're traveling or if there's more stress.

Or if you just had a flood in your, you know, your office or whatever, right. There's a lot of different reasons why you might want to modulate that does like if, if a quarter really works for you, well, most of the time, but then it's like, Oh crap, I have something really stressful and maybe need like a half, or wherever it might be.

So, and the way we developed. The Trocom specifically, the one that's for relaxation and anxiety reduction during the day is that you don't feel tired with this one.

So you can take a quarter or a half and you guys just drop back down into like a cognitive capacity. That's significantly better than it was when you were too stressed.

And we all know that feeling of just having too much stress in the brain or too many stress overall and not being able to think as well. It's because we're not getting a blood flow to the.

Get that executive function, that cognitive processing back online. But if you can just drop down the nervous system a little bit, it can go a long way to making you feel better.

Well, let's talk about nicotine. I'm grateful you brought it up because I've had, I read the research, you know, getting nicotin in can be helpful for cognition, kind of like caffeine, right?

And yet when, and the reason I found out about this was because, because had patients coming into my office saying, hey, using a nicotein patch or I am taking the, am using the nicotenin gum and my, so is my partner and we feel more cognitively online when we use it.

And so then they went into looking at the literature and starting to suggest it to other patients, and other patient were going, what? Is this my doctor telling me to smoke cigarettes?

No, no, not at all. But there is this great potential for nicotine to be supportive of cognition. So talk us through that. Tell us what you understand about that and how you deliver it with transcriptions.

I mean, I'm a dear kid, but I grew up in the 1980s and we had all these buses that used to come to our, our schools to tell us not to drink, not the smoke, But especially not smoke because smoking was terrible because of the nicotine in it.

So it was definitely a reprogramming on my side too, Heather, when I first learned about nicotin and how it's being used. not vaping or not smoking, but actually in gums and patches and others and seeing fantastic effects on cognition.

And it's like the baby with the bath water kind of thing, right?

GABA-supporting compounds and Troscriptions formulations

And so most of us were up that nicotine was bad for you. It was the devil. He was going to addict you, you were going die of smoking related disorders and cancer and things like that.

against smoking and vaping. And that's not necessarily for the nicotine. It's actually related to how fast the Nicotine gets in the body, which is very fast.

and also the other things that are in nicotin containing tobacco products, Which is usually additives that make it more addictive. Then of course, there's also, the dose of nicotein that you're getting when you vapor and smoke compared to being more modular, modulatory or you can modulate it easier with other types of delivery devices.

So again, short story is vaping and smoking. Please don't do it. Okay. And then the third thing there is the dose really does matter less than about four or five milligrams a day of nicotine, at least orally.

We don' know about patches, patches a little bit different, but oral taking nicotin. There's been no, evidence, there's any addictive capacity to that.

Okay. And so with patches is a little bit different because patches, you're getting a longer acting nicotine that's kind of on there for a period of time.

So it's very difficult to get addicted to something that long acting and as a slow ramp up. Right. and so the beautiful thing about nicotin though, like, and we'll talk a bit about more delivery in a minute.

These low doses have been well-studied to improve cognition. And it does this in a number of different ways. The most well known way, if there's any way that nicotine is known to improved cognition is that it binds to a receptor in the brain called the nicotinol acetylcholine receptor.

Okay. and then this particular receptor, when it's bound with nickeine increases acyclicchole ne, dopamine, serotonin, and norepinephrine. So these are all neurotransmitters that will help you cognitively feel better.

It'll help your working memory, help, your verbal fluidity, and help. Your recall and up your focus. And so this is all well studied in normal kit, normal people, as well as people with mild cognitive impairment with Alzheimer's.

Like there's tons of good studies here. Okay. But what's an additionally interesting mechanism for the nicotine itself is actually it's profoundly anti-inflammatory in a couple of different ways.

It actually decreases the activity of a cell in the brain called the microglia. The micro glia are a sell in our brain. They're like our immune system cells in.

And when they're overactive, which happens in a lot of chronic complex illness, fibromyalgia, chronic fatigue, long COVID, like these microglia get overactive and they cause more inflammation.

And nicotine actually can depress or decrease the activity of the micro glia, improving inflammatory cascades or decreasing them in the brain. So acetylcholine is actually the main neurotransmitter that is modulating what's called your vagus nerve.

Your vagus nerve is the one nerve that comes out of your brain. It's kind of you're winding nerve. That gives you that what's called your parasympathetic relaxation tone.

And so by modulating this particular neurotransmitter and the vagal nerve, what actually people will feel, which is really interesting, right? Because we think of nicotin is a stimulant and it is on some level because it increases those neurotrasmitters that I mentioned, but often people feel relaxed at the same time.

And that relaxation is because of vagal nerve relaxation. So it's like this parasympathetic response. And so it. It's a super, that's why people like it, right?

You get the stimulation, but you also get this calm feeling at the same time. I like, I work with it myself in my own, my on sort of workflow, depending on the day.

and I do notice this, if you get, the dose right, you feel stimulated, because you don't feel relaxed at. The dose is important and the delivery is. You got your descriptions.

We actually. The first product that we came out with was a combination with nicotine, caffeine, CBD and methylene blue together, because we were looking for a product.

That could use low dose nicotin and leverage its effects and then synergize with some other really great compounds as well. And, you know, just for more context around this, I am trained as a naturopath.

And in natropathic school, we learned lots about herbs, especially traditionally used herbs. Tobacco is among them, right? For millennia, Native Americans used tobacco, the tobacco plant, as medicine.

This can be helpful for the lungs. It's sort of counterintuitive, because we think of smoking, killing the lung, causing lung cancer, which it absolutely does.

So tobacco is a powerful medicine, has been used as medicine for a long time. And now on the flip side, from the conventional perspective, there's a medication for Alzheimer's called galantamine.

Galantamines uses not only the acetylcholinesterase inhibition, kind of like Aricept, but it also uses the nicotinic receptors. The neurologists who I work most closely with this, they recommend galanamine over the other medications used for dementia and Alzheimer's.

So this use of nicotine to help support cognition and as a medicine is not only, has not been around for a very, very long time, but it's being used in modern medicine.

And through patches, you know, it depends on the delivery system. But through patches, through troches, You can get over the counter. this is available, you have access to nicotine to help to find the right dose for you and the rate delivery mechanism for your tooth potentially support these systems.

And thank you so much for explaining. I didn't even know I'm learning so. Much I. Didn't realize that it was affecting the vagal nerve and helping with some of that parasympathetic tone.

So I think something that has been you and me both had to relearn that nicotine is not the enemy. That's not that problem. It's really smoking. And it's the lung damage, the other things, that chemicals that are in there.

Now, there can be a habituation. I like to tell patients, this is just like caffeine, right? Like if you have a cup of coffee every day, you don't notice the effects.

If you take a week off, sometimes you get a headache, maybe you got irritable. Then when you go back to that coffee, it is like magic again, Nicotine can be like that.

And for someone who's struggling with cognitive impairment or if you are giving this to someone with more moderate or severe dementia, make sure that you're consistent.

Because if end up without patches, if run out and they don't get it for a day or two or three, there can some irritability. There could be some headaches.

They could have some of that withdrawal symptoms. So do you have any other thoughts to add around that? Yeah, that's interesting because I don't see it with the blue canadine.

I. Don't. See it. With the nicotine in the, in a trochee causing habituation or causing any need for increased dose over time. Interestingly enough, I think probably the reason for that is that we're using it more in synergy with other compounds as well and using super low doses in a blue can of teen.

It's a milligram of nicotine and a full troche and the average dose is a half of a trochee, which would be at just 0.5 milligrams. And most people aren't using that more than once or twice a day because they get three to five hours of focus, a flow of productivity.

And that typically does the trick. And then sometimes what people will do in the afternoons, if they don't want the stimulation is use one of our other products called just blue, which is pure methylene blue without any nicotine or caffeine in it, nothing, but doesn't give you a stimulant capacity, it does increase your overall energy and make you feel like you can continue to go without being overstimulated.

I have seen some habituation with the patches over time. And I think that, I, think it's just because again, even though you're not getting that quick rise of it, where it doesn't give you that addictive capacity, your system, just like caffeine, as you mentioned, is going to potentially downregulate the receptors a little bit.

So you get a bit of that habituation with.

Buccal troches and precise dosing

What's really good, in general about nicotine withdrawal. At least physical withdrawal doesn't last more than a day or two, typically, if you stop it.

If you are doing, using a lot of it, even if using, a ton of, it even, of using. Even if your vaping a crap ton, every day, the physical addiction doesn' last a couple of days typically.

But the psychological addiction of course could be very different because of how nicotine is affecting the brain in other ways. So I think it's important to.

divorce the concepts of physical versus psychological addiction in a lot of ways. But certainly with nicotine patches or other low doses of nicotin, that there's going to be, there might be some habituation, but it's not going be like a, like, uh, cognitive addiction.

It's gonna be more like physical symptomatology that you might find if you stop it abruptly, at least with the patches I've seen that or, or high doses, of, a of Nicotine in pouches or or others or even like the sprays, for example, Like that'll also potentially do it.

But I haven't seen it with the trokies, interestingly enough. I think it's because we're using such low doses of it in synergy with other compounds as well.

And then the other nicotine delivery form I want to be really clear we are not endorsing is the dip? Dip or tobacco. Yeah, associated with mouth cancer.

So the Trokys and dip are very different. Can you just break that down, how those are different? Yeah. So dip is going to have like a ton of other products in it.

It's not pure nicotine. And it's also going have a lot of nicotin in. Um, it is not going be like, um, milligram or two. 15 to 25 milligrams of Nicotine in a dip, not a full container.

Like in the one thing you put in your mouth and, and put it in, I remember when I was a kid, getting so sick because somebody gave me some dip to try and I put him in my mouth.

I thought I. Was going. To die. all at the same time, right? And it's very, there's a lot of nicotine, a, lot, of other products on there too. So the dose matters.

There's lot. Nicotine products. On the market now that are, that, are not even tobacco supposedly, but they're like, they are higher doses of Nicotene.

You have to be like nicotin pouches, you have be super careful. It was usually like 10, 20 milligrams of, Nic at a time. And that's, huge amount of. That, can be, very much habituated over time and, and much more addicting because of the, how much Nic.

that you're getting at any one period of time of taking it. Okay, you mentioned methylene blue. And this is a really interesting substance, again, one that's been used for a long time in medicine.

So take us through how you kind of see that, what the utility of methyline blue is. Methylene blue, as you mentioned, has been around a long, long time.

And it's really one of those things where over the last several decades, we know it, it it fantastic as something that can support mitochondrial function.

and before that it was known as an anti-infective antiseptic. It was used really the only antimicrobial round from about 1879. So 18 79, not 1979, 1870 nine until about the 19 thies.

Then it became less used in that capacity because we had penicillin and other drugs that were developed in the forties and became more mass produced in.

Still using fish tank cleaner as an antiseptic, it actually kills fungal infections. It's a fantastic anti-microbial at higher doses. But where a lot of the interest has been over the last couple of decades is in, the mitochondrial side of what methylene blue can do, concentrates in mitochondria and can compensate for mitochondrion dysfunction, either on the energy production side or things around the detox side.

I think most people know that the mitochondria is part of the cell that make energy. And what we do is we eat, especially protein, actually not protein fat and carbohydrates to mostly bring them into our cells, to actually take electrons off of our food and to bring the part into mitochondrion, something called the electron transport chain and create a gradient of energy so we can make something call ATP, our energy currency.

Once we make ATP. That is kind of powers all of the cellular processes that we have. We make about 150 pounds of ATP every single day, but it doesn't stick around for long.

It's actually very, very short acting. And then it gets recycled and everything else. When we make energy, we don't just make. We call waste products of energy metabolism and waste product is a very loose term.

We make carbon dioxide, we make water. You also make these, what are called reactive oxygen species or free radicals. And some of that is good. So we need those free radicles to help signal our mitochondria to us know how much to make and how to not have energy, but too much can also be very detrimental, especially if you don't have enough antioxidants to neutralize those.

mitochondrial dysfunction is sort of a spectrum, but it could be energy production issues, it can be detoxification issues. But all told about 94% of US adults have some element of mitochondria dysfunction, either on the energy, production side or the detoxifications side.

And the most common reason In, in least U S adults that we know of is insulin resistance. So if you're insulin resistant, if your blood sugars are high, your cells are seeing too much glucose.

And if the cells have seen too many glucose, they're trying to make energy and they aren't trying make too energy. Then the body can't tolerate that over time.

and then it causes a lot of stress and, and it caused a deterioration of mitochondrial function, et cetera, etc.

Nicotine for cognition and inflammation

I mean, the other big one is kind of a big category of. or sympathetic activation. If your body's always in a fight or flight or you're, you know, always sort of that, that place where you are vigilant, You're always releasing neurotransmitters that are trying to enhance the amount of mitochondrial energy output as well that can cause dysfunction too.

And so that's like what I call the sympathetic spiral of doom. It's pretty nasty. A spiral where it's very difficult to break because of the combination of sympathetic overdrive and mitochondria dysfunction.

There's also toxins in our environment, medications that a lot of people are taking that affect mitochondrial function, infections that do it, post-infectious syndromes as well.

And then where Methane Blue can come in is something called a redox cycling, which means that it can enhance energy production. It can compensate for challenges of making energy, but at the same time, it work directly as an antioxidant and clean up the products of energy metabolism, the product of making energy.

So that's why I call it clean energy because it's energy without the byproducts of production. You make ATP, but you also make those free radicals. Nothing but especially at low doses for to maybe 25 milligrams around for most people.

That dosing is fantastic for mitochondrial support. So I use it a ton in clinical practice as a way to support mitochondria, especially people that have a long way.

And so really seeing significant improvements with long-term optimization strategies, which can take a lot. Yeah. With methylene blue, there are a couple of cautions.

One, the potential for serotonin syndrome. And then two, just that, you know, if you have, it turns your urine a certain color and the labs will get kicked back.

So if we're trying to do a UA or look for, um, If you're tying to a urinalysis or, look, for urinary tract infections or things, anything in the urine, we run toxin testing through urine.

Then you, have to stop the methylane blue. significantly ahead of when you're going to collect. So talk me through how in your practice you navigate both those risks.

Sure. Serotonin syndrome is a very rare condition where you get this sort of flood of serotonine in the body that could potentially be dangerous, cause hemodynamic compromise, so your blood pressure, heart rate can kind of go crazy.

With methylene blue, there has never been any studies that have shown that oral methylenine blue combined with another serotinergic drug could But IV for sure.

So the reason why this can be an issue is that methylene blue also is called a monoamine oxidase inhibitor. It's an MAOI, which means that it increases neurotransmitters, including serotonin, norepinephrine, and dopamine.

And so the theoretical risk is if you are taking an SSRI or an SNRI, one of the newer generation serotonin drugs, or potentially a dopaminergic drug like a Sinemet for Parkinson's or something like that, that you would potentially have an interaction where the methylene blue combined with the SSR or SNR would cause a seratonin syndrome.

But we don't see this in clinical practice really. I haven't seen this and I've talked to a lot of pharmacists and other clinicians about this. If you're taking oral methylene blue and one of these drugs, that being said, if you are taking a search energetic reuptake inhibitor of any type, I do recommend working closely with the provider just to make sure that you were okay.

I've seen some people with some GI distress combining them together. Most of our serotonin is actually made in our gut and not made it in. 95 or even maybe 99% of it.

It's over 90, 95% is made in the gut itself. And so I've seen some GI distress and diarrhea, abdominal pain, that kind of thing when you're combining them.

But it's also important to remember that methane blues monoamine oxidase inhibition is dose dependent, meaning that the higher the dose, the more you are going to see that.

The lower the does correspondingly, you see less of that, so. I don't see it being a very big deal most of the time in clinical practice. In fact, I have some integrative psychiatrists that are weaning their patients off of SSRIs of world.

SNRIs and using Methylene Blue instead because it's got that neurotransmitter piece that I just mentioned. And also, it is working on mitochondrial function because that's a big problem in depression and bipolar and other mental health disorders is that mitochondria have significant dysfunction.

We know this very well now that if you improve mitochondrical function in a lot of these mental conditions, you can actually reverse or significantly mitigate the symptoms of the mental disorders.

So I, I think that it's important to people if you're working or thinking about using methylene blue and you are on these medications to work with a provider, just to be sure.

But that's a big, that just kind of a, big thing. That's thought to being an issue, but really not. If you were not taking IV, methylenine blue. Now, yes, your methy, if your taking methyline blue in any capacity, Your urine will turn blue Or a shade of green or something like that, depending on whether vitamins you might've taken in the morning.

So you do have to be aware of that. And it's, it is a stain in a sense of like, if you get it on a countertop or. It can stain the countertops or your clothes very blue.

buffered vitamin C, that is kind of the antidote for it from a countertop washing machine sink issue. And this has probably saved my marriage at least three times now, because I got something somewhere and I scrubbed it very quickly with, with the buffering vitamin c.

So that's just a nice thing to have in the house. If, if you're going to try it and the type of methamphetamine you are taking. also will give you either a higher or lower risk of getting it everywhere.

The liquids of methylene blue are the highest risk for getting everywhere and unfortunately, the liquids, and almost every product that we've tested on the market, but liquids are biggest culprit, they never meet their label claims.

Because the problem with methylenic blue is that quality really, really matters. It's made in a lab and during the lab production of methylene blue, it can be contaminated with heavy metals like lead, mercury, arsenic and cadmium.

Most of us don't want those in the supplements and products that we're taking. And the problem is that a lot of the

things out there that are on the market, especially over the last year or so, as methylene booze got a little more popular, are contaminated with heavy metals.

Even if their certificates of analysis say that they are not, we have tested them and many of them have higher levels than you would like. That's not what you want, of course.

As I was mentioning, that's your purity side. Then on potency side, This is how much nothing, but you actually are getting in the product that you're receiving in.

And most of the ones that we, we actually tested, especially the liquids are much less potent than they say they are on the labels. You're getting a lot less for what you think they.

There's any companies that are telling you they're making their methylene blue in United States. They are not telling the truth because. It's not possible to make in the U S unless you're a pharmaceutical company.

If you, uh, if you are a direct to consumer company and you making Methylene blue, it has to be coming from out of the country. Uh, funny story is that I spoke to a guy, at least now about a month or two ago.

He said, yeah, I bought Methylene blue from a company that said there was making the United States, but it took three weeks to get through customs. So you have to be aware of where things are coming from and what you might be getting along the way.

And so at Transcriptions, we really do care about all that.

Methylene blue, mitochondria, and safety considerations

So we do source our Methane Blue from overseas, but we don't trust a certificate of analysis that we're getting from the overseas companies, even if these are providers that, or manufacturers that worked with for many years.

We do our own independent testing again, when it comes to the United States, to be sure it is what it says it, is, and it's not contaminated and all those things.

And then only, then and only then do we put it in the products that we make. Then once we made the product, we test it again to make sure its meeting our label claim.

So this is coming from a very clinician forward perspective and because I see patients and I care about quality and want to sure that were getting the best stuff possible for people that I work with and everybody else as well.

So stitching away from these compounds, you also have deep expertise in hyperbaric oxygen therapy and red light. Can you share with us a little bit of your perspective, your clinical experience, what you've learned about that and how you're seeing that utilized?

I've been involved in hyperbaric medicine for the last decade plus now, and it's been a pretty significant evolution where the chambers are fantastic healing devices.

They really do help accelerate healing, decrease inflammation. they increase stem cells, they can fight infections, They have a lot of great potential indications.

And that's really because we're flooding the body with a whole bunch more oxygen that has a fantastic. what we call hormetic effect, a stress induced effect that causes all these physiologic changes.

And some of them are immediately, some are reversing low oxygen states. So that's why they've been studied, excuse me, hyperbaric therapy has been study in strokes, traumatic brain injuries, heart attacks, spinal cord injuries.

If you can immediately flood the body with more oxygen, you could actually save tissue from dying. And so that's good and great, but the other side of that is that if you're flooding the body with a huge amount more oxygen, you better have the capacity to do something with all that oxygen in a therapeutic way.

And what I mean by that, is when you are making a whole lot more energy, what are you also making? You're making also those reactive oxygen species that we mentioned before.

So I realized very quickly in hyperbaric medicine that. If you have more of a long-term condition or chronic condition, or you've a longer term goal. The better idea, the better framework is to think, well, how can I optimize a system to truly leverage the amount of oxygen that's coming in?

So we're making as much energy as possible and that we were making all these reactive oxygen species that. We have the capacity to leverage. The benefits of that, which are stem cell release and blood vessel growth and, and new system optimization, mitochondrial biogenesis, all of these kinds of things.

But that doesn't really work optimally if you don't have the capacity to neutralize the effect of that oxidative load, that huge amount of reactive oxygen species that happens in the chamber.

So that's where the foundational approaches are so important. For me, it's called health optimization medicine. That's a foundational approach that we use.

Uh, we actually have a nonprofit called health optimization, medicine, and practice, or a home hope for short that trains practitioners on how to optimize health rather than focusing on disease and looking at foundational biomarkers.

Looking at mitochondrial health is a big part of that. And so I use that in my clinical practice. So if I can optimize the machinery for you to be able to produce energy effectively, so get oxygen to where you needed to go.

And then make sure that oxygen can make energy and then when you make that energy, you can detoxify from it with enough antioxidant capacity. That's when we see the biggest, biggest jumps in overall performance and optimization.

And there's been really some awesome studies looking at. hyperbaric therapy for longevity, you know, reversing markers of senescent cell populations, or they can be zombie cells that kind of get higher in populations as we get older.

Telomere length going up. I'm not sure how much I believe in telomare length, but that's another indicator that we've seen. But definitely blood vascular growth in the brain.

And we have seen this in normal people with normal aging findings, see revascularization of the heart or revasterization or the genital organs and better erections for doing a hyperbolic program.

I wanted to double click on the hyperbaric program because I hear different things out there, soft chamber, hard chamber 40 dives, 90 dimes, all within a month.

What is a typical hyperbolic program for a patient that you might work with, especially like somebody older suffering with cognitive impairment? So the, the real kind of first, first fork in the road for me is, is it an acute issue or is that a chronic issue?

If it's a cute issue, then oftentimes it really great just to get into the chamber. I can talk about different types of chambers in a minute. And then if it was more of a, chronic issues, long-term issue.

It's often better to think about foundational health first optimize foundationally the ways we've been describing, and then think of hyperbaric protocol because acute protocols, if you have an, acute issues are pretty short, you know, two, five, sometimes 10 hyperbolic sessions can go a huge way at accelerating the healing process.

Okay. But if you have more of a chronic issue, then oftentimes they're talking about 20, 30, 40, sometimes 60 hyperbaric sessions done five days per week for a period of time.

And that's because the, the cumulative exposure of, of oxygen in a hyperbolic chamber during that time shifts those. epigenetic markers, these markers on our DNA that help us express various things to help decrease inflammation and make stem cells really mature into various tissues or make blood vessels grow.

Okay. And then from there, it's like, well, okay, is it acute? Is it chronic? If it is acute or chronic, then there's a different fork there. But then as far as what kind of pressure you're going to be using, There is different pressures depending on the indication.

Typically the brain is more sensitive to pressure and oxygen. So typically the pressure is around 1.3 to 1 point 8 atmospheres, which is the equivalent of being under around.

15 to 25 feet of sea water. The way we think about hyperbaric therapy is that we're combining oxygen and pressure and we are simulating the pressure you would feel under a certain amount of seawater.

And that, you know, water is heavy. You pick up a bucket of water, it's heavy, but you swim in it, and you don't feel that. So in a chamber, we simulate the pressur you'd feel in under certain amounts of see water and that pressure drives more oxygen in circulation, not just on our red blood cells, which typically carry, actually in the liquid of the bloodstream.

so the brain's more sensitive to oxygen. and so typically that's the, pressure range for the. Brain. And then you have for the body, for systemically, it's about 1.8 to 2.4 atmospheres.

Again, 25 feet of seawater to about 45 feet to sea water is our main ranges.

Hyperbaric oxygen therapy and longevity

Now, of course, It's a spectrum and everybody's going to potentially be different depending on their indication and their health. And you may not want to start at a very deep pressure if somebody's super sick.

There's lot of nuances here, but soft chambers, the, the sort of the ones that like the bag, like chambers typically go to about 1.5 atmospheres of pressure.

And then the medical grade chambers, hard chambers. Typically go, uh, start off, they can go those milder pressures, but they go typically as deep as 3.0, 3.0 like a single occupancy or maybe a two occupant seat chamber.

Then if you're going to like, a hospital or a place where there's potential dive injuries, where you have the bends, which is the initial reason hyperbaric therapy was invented.

Then you go to chambers that they're even much, much deeper than that, depending on what's required. So that's, that the spectrum there. And then for me, it's like, It's never like a one size fits all kind of thing where, you know, I'm usually looking at hyperbaric therapy in the context of an acute issue.

It was like how am I going to also. support them, I call it my educationally throwing shit at the wall strategy, right? Which is like, how am I going to support him as fast as I can, as quickly as they can so they benefit the most from going into the chamber.

And then in the long-term where they have more of a chronic or long term goal, that's when I'm really educationaly optimizing them using a whole framework that I've developed, like looking at health optimization medicine as, as the foundation, looking, at supplements, Looking at technologies, look at other practices, then that might be helpful for them.

Looking, a practitioners that can also be referral sources to help them along the way. Physical therapists, it is a, is it a psychotherapist, psychedelic therapist, you know, whatever it might.

And of course there's the hyperbaric experience itself. and then being dynamic about that, knowing that not everybody's going to fit into a mold and everybody you're going have to think about what's gonna be best for, them to start off with and where you want to go.

really individualizing it. Well, Dr. Scherer, thank you so much. Your wisdom and your passion is infectious, and I can tell that you are truly helping people optimize their whole health.

I, for one, am so grateful for the great sleep that I get these days because of you and the products at Troscriptions. I really appreciate how you've illuminated the importance of not only the GAVA system, but nicotinic systems.

You talked about glutamine. We've talked methylene blue. He talked a lot of things that I think are relatively new and maybe even controversial for people.

And so we're opening up this potential for them to get the benefits and understand some of the risks. And so this can just, I think, go a long way into helping people experience more calm, more clarity and balance in their daily lives.

So thank you, thank, you thank. You've used some big words and we've gotten into the weeds on some of the science listeners that they want to go back and listen again.

Please do maybe even have that cup of coffee or experiment with a little nicotine before the next round through. For those of you who are listening, you can learn more about Dr.

Scott's work and explore some resources at Troscriptions, T-R-O-S-C- R-I-P-T- I- O-N- S, and we'll put that in the show notes. Also DrScottShare.com, D-r-s-c-o-t- t- s-h-e- r- e- dot com.

Are there any others that you want to share with our listeners? Those are the two main places. I think those are great. And I know we talked a lot about the weeds here and the science, but in essence, what we're doing here is really trying to optimize your GABA system by short-term supporting it long- term, using foundational health programs like health optimization medicine and things.

Yeah. On Instagram, you can find me at Dr. Scott Schurr, D-R-S-E-O-T- T- S-H- E- R-r. You also can't find the company transcriptions, which is the word itself is a mashup of trochee and prescription.

So true descriptions for people that are looking, looking for it. Can find that at transcripts. And then if you're into the nonprofit, You can check out health optimization medicine at home, hope.org on the web.

What was the other place? Oh yeah. If you are interested in hyperbaric therapy and the frameworks there are the integrations that we're doing it and my company, can you check it out at onebasehealth.com.

Amazing. You've got a lot going on. Thank you for sharing your time.

Closing thoughts and where to learn more

And to our listeners, if you found this conversation helpful, please share it with someone that you love and don't forget to subscribe so you never miss an episode.

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