Introduction to GLP-1s and the plan for the discussion

Doctor. Elizabeth Yurth. Welcome to the bio regulator and peptide Summit. It is, as always, a total pleasure to have you here. Yeah. Well, it's it's a good thing we block a couple of hours whenever we're recording podcasts.

So today we are going to dive into the big topic of GLP one. And I think what we're not I think what we've decided to do is, yes, we are going to share all the amazing things about GLP ones, how they work, how they can be beneficial.

Doctor Earth has been using them in clinical practice and so can share a lot of the experience in clinical practice. But we also agreed that we are so going to flip the coin, and we're going to look a little bit at some of the dark sides of GLP ones because things happen and we believe we both believe it's important for people to be informed.

So on that note, I'm, I guess we're should we start? I mean, I guess maybe let's identify the GLP ones that are currently available in market like that, have been through the trials and the whole nine yards.

And then let's talk a little bit about the differences between them. And then we can kind of go from there. So yeah obviously we had our first generation which was Ozempic or semaglutide.

Right. Which was simply a GLP one agonist. And then you have your next generation to his appetite, which was a dual agonist, and GI gastrointestinal peptides.

And there's uptake now as a little better. Weight loss was a little more profound with it's had a little bit better blood sugar effects and was a little better tolerated where some of the type, the safety profile for so many people was intolerable.

Now I would advocate for most people, if you titrate these up slowly, they can tolerate side effects, but not everybody. Some people just can't. And so for those people whose appetite was certainly a nice job because you could get the benefits, also people who weren't losing weight at some of the time, even at maximum dosing.

You can dose the appetite and dose, you know, quite high. When the studies looked at tooth uptake, it was equivalent to bariatric surgery. You could get that degree of weight loss when you took to the Pi.

So it was really quite dramatic. And then we have the third generation coming to market, which is a triple agonist, which is when she died, and it's so we were able to use it for a brief period of time and has not come to market yet.

So it's not finished all of its FDA trials, it will probably come to market early 2026. At least that's what it said to come to market.

Available GLP-1 drug generations and how they differ

This peptide basically, or, you know, as a weight is using dips and glucagon has these the simple added benefit of it's a little bit better. And even fewer side effects.

So we did have the opportunity with we had some come in pharmacies making it for us early on. They can't make it anymore. But we did. So we did have an opportunity to use it for a while.

I would say for about four months I was using it and I and I did move a lot of people on to it. Do I think it's better? Yes. I think that weight loss was more profound.

I think it was well tolerated by most at all, but most people, so I do think will replace the other two. It probably

depends a little bit on cost. If it's in the same bracket, then yes, what likely we'll see is the same thing we saw with semaglutide two to his appetite to to now read two side is each was a little incrementally pricier.

And would that maybe the simpler approach is still going to work for a lot of people. Because the top ones we're looking at things like weight loss, adding in the dip in the glucagon is beneficial, but we're looking at the other health benefits of GLP ones.

It really is the GLP that is beneficial for cardiovascular health, for brain health, for immune health, because the GOP one receptor sits on every one of those cells.

So definitely are going to be a little bit better for metabolic control as we get to these third tier drugs, but maybe not necessary for the other things, and less so I have a question.

So can we can we kind of can we not dissect but can we separate a little bit? What's the effect of the GLP one versus the effect of the GIP versus what the glucagon agonist is doing?

Because I think that, you know, one of the things we when when you and I did a podcast, I think on semaglutide, quite at the very beginning, and, you know, when you, when, when you and I get to come across a diagram that showed, like all the different organ systems that were positively affected.

And one of the things that I think it's the GLP one that does this is it has somewhat of a of a global anti inflammatory effect. Or is that just by lowering blood sugar that then you have less inflammation.

So can we maybe help the audience understand where does the GLP one cut off. And the GI gap. And then the possibly that glucagon agonists pick up. Yeah.

So remember GLP one and GIP gastrointestinal peptide are both released by the gut okay. And they released by the gut the stimulate insulin secretion that suppresses glucagon release okay.

Now remember glucagon itself is a hormone from the pancreas that increases blood glucose levels. So one suppresses glucagon in response to high blood sugar.

But GIP can stimulate it. All right. So the GIP's will stimulate during fasting hypoglycemia. So in type two diabetes the GLP one retains its insulin similar effects.

But the GIP's effect is diminished okay because of its glucagon stimulating properties. So that's where the third generation come in. Is by stabilizing the glucagon levels, too.

So we're not going to affect glucagon levels adversely like we do if we just have the two on board. So when you do the combined therapy, the GOP and the GIP, it's much more fat effective for triggering weight loss because we actually are, the groups working on suppressing glucagon, reducing appetite and the GIP actually working on its insulin stimulating properties.

All right. You kind of get the best of all the worlds when you add the glucagon, like the, you know, the, the gun itself in, then you're going to have, a effect to stabilize things and keep everything nice level.

Sorry. Go ahead. What you feel go ahead. So I so I think when you look at the other benefits, not the insulin effects, not the appetite suppressant effects, not the metabolic stimulant effects, it's the groups that have receptors on other organ tissues, not so much the dips for glucagon.

So that's where when we look at these these other drugs, I don't think they're going to have a huge bang for the buck and say they're better for brain.

Now I may be wrong as more states come out. Only when we really study for brain health right now is I'm tired of the GOP ones. So the GOP think of them chips and GLP is both increasing hormones.

And and they have sort of a little bit of antagonists. Interesting. So is it the GLP one. Is it the GLP one specifically that for example, acts on the brain reward center?

Because because there's all those other satellite effects.

How GLP-1, GIP, and glucagon work in the body

Right. So the the, the right. That's what's so cool about it. Right. So that is the GLP one that's having those effects on or just changing your brain chemistry.

So we know that they just make you not just not want to eat because you're full, but not want to eat because your brain just tells you you don't need to eat as much.

That's why they're so they're also useful in addiction as well, right? Is that they actually are changing the brain's reward centers so we don't feel rewarded by eating or drinking.

You know, there's not that oh my God, I feel so happy when I eat French fries. You just don't get that. And that's why they've been really I mean, this is still early on alcoholism, but the, the early studies show that with alcoholics, they had much better remission of ever drinking again when they were put on a GOP.

And that's that depressing. The rewards that are but interesting enough, if you. So if you get somebody to exercise a lot while they're on GLP, they'll be more likely to continue to exercise.

So they're also seen to help to benefit sort of the positive that so good. So let's and then for the GIP then. So okay so sorry going back to LP one. So it acts on the brain.

We know that it also slows gastric emptying. So it slows down the emptying the stomach meaning in plain English you stay you get fuller faster and stay fuller longer.

Which is a good news bad news thing because it's some people we know. It slows down the transit time through the gut so much that they develop this crazy people can develop really bad constipation, right?

Yeah. Horrible participation. Yeah. Yeah, that's probably the biggest I think the biggest side effect I see this and I guess the other one that I, that I've seen or that I've observed because I'm not working clinically with people, but what I've observed is there's a, there's a small group of people that get crushing fatigue, like crushing and either fatigue or nausea.

And you've seen this, right? Like I'm sure. Yeah. And it's part of the hardest thing to also like this, this horrendous fatigue seems to be something that sadly training doesn't seem to help that much.

A lot of time just if you don't tolerate I think and this is the same group because there's a lot of data. Also, when you look at hair loss and we were saying, well, the hair loss is all loss of protein.

So it's it's loss of protein, loss of minerals. It's just decreased intake. Oh interesting that maybe not. There appears to be a group of people who, even if they're keeping their protein intake up, even if they're taking minerals, even if they're doing everything right, seem to still get dramatic hair loss.

I says that this is some type of autoimmune effect, and you know that you see that with all the peptides, there are people who have weird immune responses sometimes to these peptides, even though they're natural to our body.

We see it with, you know, CJC and if I'm wrong, I mean, the CJC will create immune response in some people. Why? You know, it shouldn't and yet it does.

I do think that sometimes I think that's where this crushing fatigue comes from because that's an autoimmune detectable autoimmune diseases. Crushing fatigue as part of this antibody I do think is hair loss group too, because

I have a few women who, you know, I'm I'm monitoring the protein intake.

They're taking B minerals. They're doing all these things, but they're they're all, you know, their their nutrient profiles look great and they're still experiencing hair loss.

And I have to take them off of it. So I think there's some type of auto immune response that we see with a small number of people. I don't know why why a peptide that we naturally make would create an autoimmune response.

So my guess is something that's in the carrier molecule. Is something else there or just in the synthetic version, that it has enough little minor differences to our own.

Right. There's something there's perfect. Well, it's interesting because you have a lot of people in the auto immune community who who use these compounds have very tight, like micro doses, which of course, Eli Lilly hobos walk your ears.

Yeah, like block your ears. And it can be super helpful, right? There are people in the auto immune community that have had spectacular results with tiny doses.

Right. I use it a lot in my autoimmune patients with very small doses because of the the benefit to the immune cells. So we know very much that the GLP one that that our lymphocytes have your P one receptors.

So when you look at systemic inflammation it's markedly reduced with the groups. So I think that it's a it's a it's a great option. We use it in our long Covid people. Right.

Those are you know huge fatigue people to to really help stimulate immune function. We're using it in our autoimmune people a lot. It's like, you know, it's in the people I've seen the fatigue in aren't necessarily my autoimmune population.

They're my just regular people. You know, I cannot take this drug and you try to listen up to an even a minuscule dose and they just can't tolerate it.

So there has to be something, you know, something that in a small number of people is just stimulating the immune response. Just it's not even the autoimmune people that seem to be getting it.

You know, but like I said, I can't think of one time that I've not had somebody, you know, say it was always somebody, right? Who has some kind of reaction.

You're like, well, I shouldn't cause that. But it does, right? Even the most benign peptides in some people create huge welts or create, you know, where they get itching all over or, you know, so so we've we've seen this, right, you know, and they're like, I can't believe I'm allergic to it.

I think it's an immune response sometimes. Have you seen the BPC 157 response. Because that one is crazy. And and it's it's completely counterintuitive.

Right. So BPC 157, it's supposed to balance neurotransmitters. Right? Right. We make these. Yeah. It's the dodgy stuff. I shouldn't create a histamine response. Why?

But I've seen it. Right. You've seen it. Like certain things you see will often create an immune response. BPC will create an immune response, you know, you know, with science and alpha1.

Brain, reward, inflammation, and addiction effects

But that's in of definitely. So this is all the peptides. I don't think this once you know it because there's a small number of people I can count the number of people who have had.

But but we can't discount that some people, you know, if ever a doctor tells you, oh, that can't be causing that. That's obvious, because anything can cause anything.

And I you know, I've been in practice 30 years. I've seen it all where I said that, I looked it up. That is not even a side effect. And yet you stop the drug, you get better, you start the drug again, it comes back.

So, you know, I just don't respond the necessarily the way where we think they should. But I do think when you look at the the data on GLP ones, particularly on their dampening of, of like nuclear factor, kappa, beta and or P3 inflammasome, these are all these inflammatory markers that are elevated in autoimmune disease that are elevated in long-covid.

They're elevated or post-viral syndromes. They're elevated. And nonalcoholic liver disease. I think that's where their huge anti-inflammatory benefit like like, you know, plays a big role.

Now, is that just the GLP? You know, I, I think it's the primary effect. I think GP's do have some benefit there. But I think when you're looking at these, these long term benefits for brain health, cardiac health, if side effects is not an issue then probably sticking with just.

Yeah. So a good time. And I think that you know and the thing with semaglutide is from what you've talked about because there's receptors on all these different organs, there's a direct impact on the organs.

But we also can't get away from the fact that once you lower somebody's blood sugar, once their lipids come under control, once their inflammation comes down, that's also going to benefit the whole system.

Like that's the that's that satellite kind of halo benefits. Everything affects view. Obesity. Right. So even if you don't have people on weight loss doses, when you get inflammation down, they lose weight because fat is is partly a story, right?

As those people who just are so inflamed they can't lose fat. So, you know, I agree, once you get that inflammatory piece under control in with a low dose, you start to see, okay, so what I want to I want to make sure people walk away from this knowing like having you know, and I do feel like if they've been listening to you at all or even me, sometimes people know what they're marching orders when they're using these compounds.

But for the people that are listening to this podcast who are relatively new to the space or haven't listened to a lot of stuff, why don't we outline for people the Dos like the things you must do.

If you're using any of these compounds and things you really must stay away from. And then after that, I want to go over to some of the negatives that we've seen starting to emerge over time, that are, that are getting more air time these days.

So let's start with the if you're going to be using these compounds, here's what you must do. I think the first thing is why are you using them? Right.

So if you are using these compounds for weight loss or metabolic control, because your glucose is not ideal, your insulin levels are a little high, then, you know, because that's the group that we're going to see more right in the problems, especially the weight loss.

Excited? They're really anxious. Get their hands on and right. And they want to lose weight fast. And they see their friends. They lost 20 pounds in a month. Right.

And what I would caution is you can't do that. You can't do that with these drugs. It's not safe. And when we look at the complications that have arisen, like all those horrible stories you hear, like my ear doc friends like, oh, we hate the top ones.

When people coming in with my, you know, every bad thing, which is all due to people overdosing, getting

horrendous constipation, getting pancreatitis, you know, those are all issues with dosing too aggressively, too fast.

And so I do think even if you're like, if I feel like I don't get nurses with anything, I'm going to do the full dose. Just a bad idea. You want to sort of start low and then slowly titrate up.

And the other reason for that is we know that rapid weight loss fat is a great harbor of toxins. So all that crap that you're exposed to all the life, the seeds and bpas and all this crap that you were exposed to, that you know, I'm here, how pristine you are.

You're going to get exposed to it's being stored in fat. So right now it's tucked away. That's cells. As soon as you start rapidly losing fat. And these fat cells are lysine, what happens.

All these toxins is spill out to your system. So it's another reason sometimes people may get, you know, horrible feeling, like they feel horrible. They feel the heat.

It's because they just had a huge toxin burn dumped on them. So ideally you want to make sure that somebody has sort Right. You make them for the gas, you know, your B minerals and T make up for the gas.

It's hugely beneficial, right, to just help get rid of some of the toxins, replace the mineral so you can do those along side to really help because you can feel the gas that are great for like glyphosate detox and BPA detox.

So those are really simple things to do. Plus you getting your added minerals. And so you know you get huge benefit. So I put everybody you know something there.

But it's also why you want to lose weight slowly not rapidly because there's no you can do you can do your charcoal detox. You can do, you know whatever your favorite detox is.

If I rapidly dump a lot of toxins into your system, you're going to get sick. It's not going to be good for your brain. It's not going to be good for your heart.

It's not going to be good for your liver. So what I would caution everybody is yes. I don't care if you're not getting nauseous. You want to lose weight slowly.

And and you know, you're losing a couple pounds a week, not 20 pounds in a month. Even. Even though it is possible. Right. And so I that's the first question.

Now, the other group of people is the good people are using these for every other benefit, and which is the group that you know, we are preaching so much to is that, you know, For the dark side that came out, you and I heard over and over again was the sarcopenia, right?

The muscle loss, the fact that these caused muscle loss. And we really if you look back at the data on GP's, the very first ones that came out, liraglutide, they were designed actually to help diabetics maintain muscle because they preferentially pushed glucose out of the blood into the muscle where it's good, pushed insulin into the muscle where it's good.

You know, that's why the bodybuilders will inject insulin after they workout, because you actually can build more muscle. So there's no mechanism for these drugs to cause sarcopenia.

None. That mechanism is the opposite. You you lose muscle when you reduce your intake to the point, especially protein, right to the point where you're going to lose muscle no matter what you do.

So, so and it's really it's really hard to eat enough sometimes on this, which is another reason to type more slowly, is that you can't find a dose where you're still eating.

You still feel like, okay, I can still get my hundred and 20g of protein and 30g of protein in a day. The other thing to

remember about muscle loss is muscles really dependent on adequate hydration.

So the other big things these drugs do is they decrease your desire to drink water so that you watch. People will start drinking a lot less water muscle, really dependent on having an adequate intake of water with some very particular amino acids attached to it.

Common side effects and why dosing matters

So that is so important to muscle intake. So the other thing that causes sarcopenia, you like people say all the time, okay, I'm eating enough protein. I'm still losing muscle.

I would argue most of those people have solidarity hydration. If you do like a seek or in body scan on them, you'll see that they're they they don't have good intracellular fluid levels.

So workarounds on that. I love a brand called I Sell water. New bio age makes it I sell is a combination of it's got some creatine. It's got some some taurine.

It's got some leucine. But basically it's a it's a perfect osmotic load to help push the water into the muscles. So that's the other thing I always recommend to people is they don't know why.

It's why they drink that Don't neglect those of you are trying to put on muscle. Do not neglect the importance of high. And profound as proteins. So those are the two two reasons you lose muscle.

So we can take off the board that really sarcopenia is caused by these. It's caused by the lack. What about exercise though. Like what about challenging wouldn't the isn't that another reason for sarcopenia?

Like to me you need that third leg of that stool is the answer to that. You're right. Right, right, right. You can't stop exercising, right? And say, okay, I'm just losing weight.

But you know, and and again, if people get to a state sometimes where they are losing weight too fast and their intake is low, their fatigue levels do go up.

Even outside is autoimmune. People we talked about with the you know, their fatigue is good. So you don't work as hard. You don't get up, you know, go to the gym like you usually do.

So you really have to make sure you know. And lifestyle still always, always, always takes precedence over everything else. Whether you are up one or not.

You have to exercise, you have to get sleep. You have to do those things as well. Right? So so those are all really big pieces. And as soon as any of those things is affected by your intake of the GLP, back off the dose, back off of those, you will still lose weight.

You will lose weight more easily and more safely. So we have to get off. This sort of bandwagon is where I get a little perturbed by all the companies now that are handing out GP's just, you know, like candy and and people can dose them sort of wherever they want, and then get more when they run out.

You know, we're pretty careful monitoring our patients, making sure that their interests like hydration is good, making sure their protein intake is good, making sure that they're losing weight in a sensible fashion and, you know, and keeping track when they're refilling these drugs, the refill them every two weeks.

And yeah, probably they used to not like it prescribed. So I it's where you know, I love and I have this argument with my friends who I have a friend who has a company that does this right.

He sells these GLP ones is doing great. You know, and I'm already one of them. He said, you know, there's this argument. The other side is that obesity is such a horrendous disease in our country and contributes to so many

other deaths causing things, you know, from kidney failure to cardiovascular failure to greater dimensions.

So, he argues, you have to make these things accessible to the, you know, the poor population who is sitting in, you know, in, in rural Louisiana and can't afford them.

And by making these affordable, you're still saving lives. So I do think I always have to sort of way that, you know, in my mind of, okay, working with a doctor who might be pricey and, you know, getting these, these more pricey versus getting, getting them online for somebody who's right, I mean, accessibility, you know, democratization of these things is, I think, somewhat important because otherwise it's not reaching the people.

It's using the, you know, the people like you and I who are pretty aware of all this stuff anyway and probably don't need them nearly as much, we can get them, but the people who need them can't have access.

So I do appreciate that there is access available. It's just that there has to be a little bit more education behind it than what's been done. When you're dealing with people, especially people who are, you know, who need a little bit more of the education around them.

So then, you know, so I think that that's our big cautions about these. And, you know, and I think that that whole psychology, which I still keep hearing, I still keep your it will one day it will not take away.

And I was back in the history of these drugs because it's very obvious people say that not because doctors, say it will eat your heart muscle. And I'm like, come on.

I mean, so I went digging into the literature for this, and there I found an article that said yes in people Who Lose a lot of weight. But this is seen even without the GLP ones.

This is any extreme weight loss. It's right weight and diet. Right? Because you do. Because your heart is muscle and you will lose muscle mass, including your heart muscle, right?

So your heart, your heart is a muscle. And when you become ATP deficient, when you're energy deficient, you will lose heart muscle. But if you look at the GLP ones with even at low dose, with adequate nutrition, that's why we're treating heart failure with them.

Right? The, the study that came out, looked at them compared to placebo, showed a over 52 weeks, lowered the protein by 44%. wow function by almost. Yeah.

So you know that's dramatic. So we're not losing heart muscle if we're increasing cardiac output if not more in three weeks. Product was certainly not losing heart muscle.

But yes, just like all the rest of our muscles, the heart is a muscle. It will decline in function and size if people are not being healthy or adequate.

Hydrogen. But yeah, I think the select trial was the trial that looked at cardiac function. It was like 70,000 people and the results were dramatic. You might not be saying, who's our cardiologist?

Uses them on almost everybody with any kind of cardiac disease because they're helpful for lipids. They're all for, you know, coronary artery disease or even blood pressure.

Right. Almost everybody gets put that pressure on normalized. Yeah. Blood pressure. Right. Right, right. But isn't this even independent of the weight loss and the cardiovascular effects in the independent of weight losses.

And people did not lose any weight, and we just put on a dose that was for was beneficial to help other things that we saw. Again a 40% reduction in C-reactive protein.

There's not much that does. And you see with these guys, you know, the heart failure, 6 to 6 minute walk test was

approved in 80% of people. So improve their function as well.

And that was just that was 99 2.4mg dose. And it was a 1.2mg dose weekly. So was a pretty small dose. You know, the prevention of kidney disease for chronic kidney disease have a lot to treat. Chronic kidney disease.

You look at the drugs that are out there that people give with chronic kidney disease, and it's huge, huge number of people who have poor kidney function.

Just when we test people, it's probably over half which has effects on kidney disease. It reduced it reduced progression of the disease by about 29%. So we get we don't have another drug that does that.

So you know you look at cardiovascular kidney alone that reduces all cause mortality by about 20% right there. But those two diseases so so again when we start talking about these other bad things, some of which can be prevented by just using the drug sensibly, some we have to talk a little bit more about.

We really need to look at, you know, how well that official these drugs are. We don't have a great disease. If you're if your ejection fraction is 30%, you know, because you had you had a heart attack two years ago and so now you're it's just not working.

Well, there's not much you can do. Basically you tell people, okay, well, you know, exercise as much as you can get a little bit stronger. So to have a drug that we can actually improve that, to have a drug that can improve kidney function when we don't have anything else in that that realm, we need to really keep paying close attention to these drugs and not sort of shunning them, because of being useless.

And then the other, I find the other piece that is important to communicate to people. And this is where it gets really tough with, with your friends business, with people who you know, don't have access to are under resourced, let's say, or undereducated.

And because one of the things I think you and I will agree on is nutrient density becomes really important. Like you're in order not to become deficient in so many of the minerals and vitamins and micronutrients.

Yes, you're reading your protein first, but you're also trying to get in like those leafy vegetable, like the rainbow, you know, like your veggies and your healthy fat so that your body gets all the things, the nutrients that it needs.

And this is where I think with those populations you're getting into, you're getting into some trouble because they don't necessarily have the resources.

But for people, that's a hard problem to have. The resources. Nutrient density is critical. Right. And you're right. What do we do? I my my sister and her husband lived he taught school at Indian Reservation.

She was a writer there.

Preventing muscle loss, dehydration, and nutrient deficiencies

And, you know, you go to this Indian reservation with and you go to the grocery store and there's not fresh food, there's not fresh vegetables, there's, you know, it's it's nothing.

So we have to keep working on solving that problem, too, because that's part of the huge obesity problem is that we don't have access to the healthy foods, you know, and it's why, you know, unfortunately, a lot of the cool things that you and I talk about and do, you know, are, are, yeah, the people who probably need the most, and, you know, and that's where this whole how do you democratize these things and, and should we be making these things very available to everybody?

Should everybody be given a GLP one, you know, at a super low cost, you know, or is that because is that easier than teaching? I don't know, I think, you know, I think to your friend's point, if you take someone who's 300 and

something pounds and not doesn't have the stature for, let's say, and you were able to bring them down to a weight, even if it's not ideal, that is more comfortable and allows them to move and allows them to be freer.

And and their heart disease risk goes down, right. Kidney disease risk goes down and and they can function. We've still help them to some degree. Like we're not you know, we can't just be here shaking our fingers at someone going yeah, yeah, right.

How to eat properly. Yeah. We're not giving it to you. So finding. Yeah. I mean, I hear that a lot too, right? Where doctors are like, just, you know, And and you're right.

300 pounds and you can't even hardly get yourself out of bed. And you're. You have a heart that's pumping that 50% of its capacity up in exercising, getting, you know, walking.

People to eat better and exercise. We have to help them in that realm. You know, I talked about this a lot with a lot of different peptides we use like, you know, where because I've had a conference and they, you know, and I was the centers we would talk about, you know, what everybody just needs to do is exercise.

I patients who literally can't exercise, you know, they're, they're they're so deconditioned from Covid or heart disease or whatever it might be. They can't exercise.

So they have to do sheets to help them get there. Right. This is one and there's other peptides you can use to kind of help that alone. To, to kind of stimulate exercise in a sense in people.

But we have to be able to say, you know, we can't just tell people, you're not going to get this because you're not eating right. You're not exercising.

We have to sort of help them get to that stage where they can't eat and can't exercise. And you see that all the time. Once people see that, they they they start to feel better.

They are more willing to walk. They're more willing to listen to you. They're more willing to engage about things. So so that's another pet peeve I have is I hear this all the time.

So in those doctors who are just given this job, ones are just lazy. They should be counseling patients. They need, you know, they need both. I mean, that doesn't work.

I think that you have a population of many both. And I I'm not going to pick on doctors. But I mean, you know, you have a population of prescribers or advisors who are just saying this is the solution without the proper backup and they're missing the boat. Right?

So you can't just tell people to move, move more and eat less because they've been there, done that, got the t shirt, didn't work. They're stuck. Have a broken you know and they need a hand.

And this this is the hand for many people right. So okay so we've talked a little bit about. So we've talked about sarcopenia hopefully how to help people to address that and off and and avoid it.

And you know if you end up with a few less pounds of muscle but it's more functional muscle and you're feeling better and you're healthier, then you're better off.

Like, let's be clear, I don't think that longevity means being a muscle bound giant person, being longevity means having a reasonable amount of functional muscle on your body that allows you to live life.

All right. I want my body. You know, we see the videos drop dead all the time, right? You know, I mean, that muscle is not is not, you know, so just having massive muscle on you is not a super healthy thing either.

We're meant to carry a certain load of muscle, and we need to be functional, to be able to move and be able to do

things. It's not just all about just just strength is functional muscle, right?

It's doing functional activities with your muscle. It's not just going to go up and going, you know, and say to I can I can bench press 300 pounds. It's great. I'm happy. Bench press towns.

But you know, you need to be able to use that in a functional, appropriate way and having the right amount of muscle for you. We love the muscle. Right muscles are energy currency, but it's the right, not a muscle size as well for your frame.

There's a great lecture that talks about, you know, the they look at bone size on people. Right. And you can sort of tell how much muscle a person should be carrying by the bone size.

I'm not a huge person, so I'm not going to be able to carry medicine as well. So, so easily. All of these, these parents bringing their kids to be trained, they wanted really huge to get a look at them and say, you know, your kid can only be this big.

That's just where he's going to be. You can do a bunch of stuff to help them carry more load, but carrying that load to be more of a strain to him, you could tell because his body was never meant to carry that kind of medicine is appropriate amounts of muscle for all of us, and not every.

So you can't look at that person who, you know, like jealous of the way they look like, oh my God, you know, look at them. You know, I want to be that.

Okay. So going back to our GLP one. So so we've talked a lot about the benefits. Now let's move over to there's a couple of black box warnings. You mentioned pancreatitis earlier which is probably more likely to happen again in the very fast weight loss.

And also have you seen this in people who drink like alcohol. Like do you advise your patients to maybe lay off the booze when they're using their gulping ones, quite apart from the whole empty calorie problem, which we've people know that we know that.

But is it is there a world where we're trying to, there's such a load on a pancreas to avoid it kind of spinning out? Or is there no relationship to this occurrence of pancreatitis with the GLP ones?

Well, certainly when you look at pancreatitis in general, it's much higher in people who are. Yeah, alcohol abusers. Right. So you see more pancreatitis in general.

So I think you add the GLP one into the show probably that might accentuate that number a little bit. But in general there it doesn't appear to be linked.

And you know, the pancreatitis link is interesting in that, it's a little bit of a more of a created problem as well. So it might be a small number of people have a little bit of an autoimmune disease.

Maybe this is stimulating beta cell activity or beta islet cells in a group. So is a stimulant to tell these islet cells to release more insulin. So if you look at people like type one diabetics, and we're seeing kind of a host of this sort of resurgence of what we call, you know, a lot of syndrome or late onset adult type one diabetes that's become kind of prominent post-Covid, where people end up with type one diabetes.

They started making antibodies against their own islet cells, like you would Ice age, what's called a lot of syndrome. And we're seeing a fair number of those anymore.

People who appear, you know, like have anything of their type to diabetics because they're glucose is super high and you measure their insulin and they have no insulin.

So, so appears to already be something that's pushing, you know, maybe it's Covid, maybe it's something else. I

don't know. Is pushing this a little bit of a piece of an auto immune attack on pancreas already.

So if we have a drug that's now to stimulate activity and we have any kind of propensity along that line, could I then start making more antibody activity against my own islet cells, against my own pancreas, and start creating pancreatic cancer, if I'm sure it changes?

So I think this might be in the few people we're seeing it. It's very rare, but it's dosed appropriately and not elevated too fast. But there are cases reported, and I think that those people probably if you were to look at them, I bet you'd see a few of them have some like Juicy peptide and on you advice, things like that that you'd see some more autoimmune disease.

You know, I've not seen I use allied groups. I've never seen a pancreatitis case. I practice optimized, but then I'm also treating a lot of, you know, but it was immune system healthy, right.

You know, and most people. Right. So so I think you really see that more and, you know, some of the other people. But I do think this may be a little bit more and probably less related to lifestyle, a little bit more or less, maybe some kind of autoimmune piece.

When you look at that, I do think we do have to look at the, the pancreatic cancer, I mean, the thyroid cancer, which is the other big black box risk that was that I think is going to be taken off, because the black box warning for cancer really doesn't hold true because the thyroid medullary cells actually in humans don't have GLP receptors.

So in mice it does, but not in humans. So the thyroid cancer we can take off the book because it's still on there is a black box warning. You know, hopefully I think early next year I'll have that taken off because I also met their guidelines.

But I do tell my patients with thyroid cancer that there is that warning. But this is unlikely cause. But you know, we'll fall thyroid those people died proxies antibiotics like that to make sure.

But I think that one can be taken off the board.

Cardiovascular, kidney, and metabolic benefits

I think the pancreatitis is going to be sort of a rare, more immune mediated thing. And in obese people who are rapidly who have rapid weight loss or rapid food, big things, whatever you guys, whenever you make big, rapid changes in your body at one time, our body really adjusts even to be bad, even to be being unhealthy.

It's adaptive that a lot of adaptive changes to accommodate for that. Right. Like it's amazing what we can survive, what our body does to sort of survive.

And so it doesn't like to have big rapid, you know, in a while to adapt takes a while to, adapt. So whatever you try and push it into something too fast.

Also you went from 300 pounds, 250 pounds. It doesn't know how to respond to that. So I think that's the biggest caution is that's why we want to do things.

We want to move needles more slowly on people as anxious as we get. We don't we don't want to move things fast because that's really are going to create autoimmune disease and criticism and toxic exposures.

And remember, that's the whole time as Doctor Years was saying earlier, they're they're they're stored in fat in our bodies. Well, when they get released too fast and they're, they're, they're circling around looking for a new home.

Right. What's the next best fatty place in your body that they can hang out in? And that's your brain. And your nervous system is made of fat. So this is where, I mean, when I, when when I was in school, I used to talk about make sure that the doors of elimination are open.

So that's the liver is functioning, the colon is functioning. The kidneys are working like all of those. That's where sauna comes in. The sweating, like all of those things.

Open the door so you can let the trash out kind of thing. So. Right. And remember and remember, you know, get rid of toxins in stools is a big way. We get rid of toxins that we create constipation in people too.

So they're not eliminating, you know, they're not I mean once every three days now. So you really have to be cognizant there are two that we make sure that we're we're giving people some help in that realm to, the extra five or whatever it might be, or, you know, a little actual something that will help to stimulate the get a little bit, too, because that's one of our major detox mechanisms.

If you're not pooping every day, you're not detoxing in either. So we kind of double whammy. And we released a whole bunch of toxins. We've taken away some of that.

Okay, so let's move on to the latest and greatest warning, which doesn't even hit the black box. But it's got it's big enough now that, there's a big lawsuit against Novo Pharmaceutical, who are the manufacturers of semaglutide.

And this is this sudden, optic nerve optic. I, I don't even know how to describe it, but basically, people wake up one morning to the next blind. That's it.

It ischemia, optic neurons. It appears that the blood vessels, the optic nerve, just, you know, clots and and you're and you're blind. So, yeah, people, you know, are really and permanently blind.

I mean, these cases are lost. These are people who are permanently blind. It doesn't there's not a way to restore, you know, the the optic nerve rapidly.

We start this point in time. Now if it happens more slowly, sometimes they can do things. But this is why this rapid onset. So this study came out in, Jama in July.

Why it's a pretty recent. Right. So really just about six weeks ago, the study came out And all my patients, of course, started getting scared because basically what the study said is that one of the things, although rare, one of the things these drugs could cause is sudden and permanent, like a pretty scary thing, right?

Like, you know, of all these other things, we're kind of like, okay, well, maybe I can deal with this or that, but it's an answer. Blindness. Absolutely terrified.

So so should this be are like, okay, we gotta stop using these drugs. We got on the bandwagon too fast ways. Now the bad stuff's coming out. Should we stop using these drugs?

I do think the study warrants some some concern, but I think not to overblown it. Will I change my use of these drugs because of this study? No, but the big things that makes our takeaways in the study, number one, it was a single center study.

So it was done in one neuro ophthalmology referral clinic. So, so these were all patients that we referred to this no ophthalmology clinic. So they were all already people who had who like we had some pathology.

So it might not represent the general population in general. Right. They're going to probably have more problems, severe eye problems that they need to go to some specialist.

So all that said there was retrospective study. So went back to this one clinic, that dealt with all these patients. Right. And then they looked at their group of, of people who were on GLP ones, and there was over 16,000 patients.

I don't know what the exact number was, but was greater than 16,000 patients. And out of that, 37 of the semaglutide users developed the systemic optic neuritis.

And that's that's still small number 37 out of over 16,000. But if you look at the general population, that disease is really rare. It's like two out of 100,000. Right.

So even this very small number is a big escalation from where this disease usually stands. I think that one of the things the study said, and what we sort of have to always look at when we're looking at causative factors, is what is the cause.

And the problem was that, you know, all the researchers who put their heads together. It's what's causing this. You know, P1 caused the ischemic optic neuritis.

Yeah. And nobody could figure out a mechanism. It was sort of like oh no, it doesn't make sense. It shouldn't cause this vascular obstruction. It shouldn't cause this effect.

So there's no. So you know right now it's correlative right. That. Yes, 37 of you know, but again retrospective study of people with underlying eye diseases.

If you look at the general population of people on, you know, on the GP's, now we're taking a subset that already have some eye disease, but still something they're right.

Correlative, causative something there. So you know, again, again don't be afraid because this is still a really low risk. But it would caution me, thinking about my patients who do already have maybe some kind of severe in, you know, diabetic retinopathy, something like that.

Might want to be a little bit more careful in using in those people. Now, what they also found is areas where they looked at the correlations. Every one of the people who developed this had hypertension, I diabetes that poorly control hypertension.

They all had coronary artery disease. They all already had pretty significant signs of vascular disease. Right. They also found that most of them I think Abraham had sleep apnea.

So they also had, you know, had one that that'll drive up inflammation. Right? I think that they could be safely back. They also found that they all had an anatomic similarity of what they called a crowded optic disc.

I'll be an ophthalmologist. I don't know exactly what that means, but they all had a similar anatomical, just the way they were made deviations. So the question is, okay, well, if you have a diabetic retinopathy patient, then they want this drug.

Should they just see their eye doctor make sure they don't have this graphic. That's great. I don't know how that is to look at, but it seems like it's something that's not that hard to look at if you're doing a, you know, a study of the, male much more likely than females to have that.

So also interesting.

Access, obesity care, and the importance of lifestyle support

Well, the biggest thing was that all of them also that had this outcome had sudden glucose or weight drops that triggered eye competition. Now remember, out of surgery, people, they didn't all go blind.

They all developed that. I think, you know that these were not people who did also 130 some blind people with 37 who presented with an optic life. So some of these people are developing rapid blindness, some people just a damage to the optic nerve which can progressed into blindness. Right.

So it wasn't like 37 people were at the point, but a few people will. Right. So I don't know of those 37 what I think maybe that at least two, maybe more did develop some sort of blindness, but all those people did have a sudden glucose and sudden weight drops where they did a pretty dramatic weight loss fast.

We know that, at least in diabetic retinopathy. So people who have damage to the little blood vessels in the eye from diabetes, if you drop their blood sugar fast, their diabetic retinopathy markedly worsens.

So we do know that something happens to the blood vessels of the eye when you do a big shift in glucose metabolism. So I think there's a lot of underlying issues here that for most of our patients aren't.

This is not going to be an issue. Right. This was not something seen in our healthy population. But if you look at the obesity population using these drugs, how many of them do have diabetes?

How many of them do have coronary artery disease? How many of them do have sleep apnea? Yeah, a lot. In fact, I would probably venture to say in that, in that more morbidly obese group.

Yeah. Most do. Right. Yeah. So most ambulatory issues. Right. So the problem is that the most the people who are using these drugs for the rapid weight loss probably also have these underlying issues.

And it's where I think we have to use, we have to look at this study as not just shunting off. It's okay. Well, you know, this is bullshit. That's you know, no normal people had this.

But looking at that, we do need to be cautious in, in in these with the obese population who were using these and and that's again where I think we have to be careful with some of these online people are ahead.

Now we've got it. Sounds like we need more. Do you know what the outcome of us should be is maybe some screening parameters that says in this population of people, it would be a really good idea to check for even in the absence of having an absolute understanding of what's going on, let's check for this, this, this and this, and then proceed even more slowly then.

Yeah. And that's what we're concerned with. Right. So try to slowly watching for rapid changes in glucose and wait, wait you're right. And maybe you know and maybe requiring that these people do have an eye exam ahead of time.

You know, is useful, which I don't do in my population. Right. But you know, you know, but I the world is filled with morbidly obese people who are taking these drugs.

So I do think that, you know, that I, I think number one take home point here is the benefits of these drugs from the neurologic. I mean, we don't even talk about the brain studies and, you know, and, and the profound effects on preventing cognitive decline, you know, at a very low dose, the cardiovascular benefits, again, way more people are going to have sudden death from a cardiac event than at wake up life.

Right? And so the number of people were prevented from that outcome versus, you know, is is huge. So we really have to again put the study in perspective.

But I don't want to just throw it away. And, you know, it's my favorite thing to do is to just recycle. Best bullshit. Whenever it doesn't agree with me.

You know, so I really I before you I talked, I really picked apart the study, you know, and and said, you know, there's something here. It's it's too many people. There is something here.

Even if we can't put our finger on it. And it does make me walk with a little bit more cautious step in how I'm using these drugs in people. But to tell me that all my patients who are now saying I don't want those drugs any more, they can cause me to just go blind, we really have to be sensible and explain to patients, no, if you were 300 pounds, had hypertension, had diabetes, we would start slow.

We'd be cautious with you, you know, I think we should let everybody. But but we we really need to alleviate these people because all the press that if you read these articles is, you know, drugs associated with, with spontaneous blindness, you know, which is.

Well, no, I mean, many of these articles, by the time I'm done with you, you're going to go you're going to be a noodle, you're going to have a face, you're going to be bald, and you're going to be blind. Yeah. I mean, right, and I'm sure you and I are going to start seeing the podcasters coming out on this one right now.

Yeah. Oh, they're already and said, yeah, sorry I told you. Oh also your heart is going to melt. Yeah. That too. Yeah yeah. And the heartbeat melt. Yeah.

So your heart is going to know if you're gonna wake up lied on all to be skinny. You know, so. So. Yeah. Guys, please put this in your, you know. Yeah, I'll be aware, for most of you who are probably listening to this podcast, because it probably tends to be the healthier populations who are listening to these things and not the, you know, the 300, but the, you know, but you've got friends, you, you know, people who, you know who are doing this.

And I think that's where you realized, hey, you know, make sure you go slow with those that they're wonderful drugs. You know, I for one will continue my GLP one.

I'm hoping for the easier versions, sublingual things like that, to become more effective because there's a little bit of a hassle, you know, just carrying around your injections and things.

But but because honestly, I have a history of dementia, my family, and it terrifies me. And I will do everything in my power. I mean, we look at these, I just had a patient who, you know, this new test now for.

We'll get off topic here. But the new test for Alzheimer's, which looks at amyloid plaque and and and tell, and you know, and tells you, you know, if you have amyloid plaque and tells you that you're developing Alzheimer's and it's terrified study.

Right. And the state is a couple of problems. Number one, amyloid plaque is really not the cause of Alzheimer's. And it's been pretty well proven that it's not because now PTL is a better marker.

So PTL is a marker to pay attention to, although a lot of other things as well as doctors. He gets back this test he actually doesn't even have. He had a little bit.

It was in the hospital, except the so of course he was a little, you know, off so stopped ran this test on and which came back with this high amyloid hype PTL. Now keep in mind he was.

Pancreatitis, thyroid warnings, and other safety concerns

Over substance one of the new Alzheimer's drugs that get rid of amyloid plaque. And those drugs you guys have looked at him have renders side effects.

Maybe 20% of people develop brain edema or brain bleeds 20%. 20 I've, you know, and they don't reverse the disease. They marginally slow its progression to the point where the family members couldn't really perceive a difference.

But on cognitive testing, they could say we're slowing the progression of the disease. Family knows that. We don't really see a difference in the person.

So we're and we're pretty. And this is a guy who doesn't even have significant cognitive decline and stuff. You recommended from this test doing this.

So, you know, so, so so we really have very few drugs right now to treat things. Whereas going with this whole sorry, I'm with you for just to smell, is.

Is we don't have a lot of drugs for people with, with, you know, dementia histories who have, you know, has allergies are amazing. You know, pleasant allergies.

But we don't like drugs to bring that kind of decline. The GOP ones are looking markedly effective, right, at a low dose, really significant benefit, not only preventing cognitive loss but actually reversing cognitive loss.

So increasing neural activity. So this is where we've got a drug that has a, you know, a very small risk of of in a very small number of people of causing a catastrophic event.

And we're, we're using like, you know, all the time, a drug that has a horrible catastrophic risk in a high number of people, you know, so this is a much better choice for those patients.

You know, I remember when I came out and there were so many experts in that field who were so dead set against it, like they fought it tooth and nail.

Yep. Because they were shocked. Shocked. You got approval. Doesn't the amyloid plaque the is it. And then you tell me if this is true or is still kind of an airy fairy theory, but there's a theory that that plaque is there because the body is sequestering toxins.

And so it's protecting so so they protect those actually protected, right. All of a sudden destroy. It's one mechanism. The brain has of protecting itself.

Right. And just given that word plaques doesn't have that any anything to do with the disease. And when they looked at more postmortem studies, there was zero difference between people with dementia and people who didn't.

In the amount of amyloid plaque. You're going on the wrong thing. So, you know, so this is a that's the wrong target. So P-Town is a good marker to follow.

And then you, you implement other things Also you guys who get this test when you see IP tell it's a lot of other things that can cause it. And so I always tell people, hey, let's make sure that, you know, all this other stuff is good, and then we can repeat it and see if it's still going up.

But these are, you know, these are where like, you know, again, this guy did immediately put them on this. What is this guy you would you know we did a watch this year.

He did not have any cognitive decline. He just ended up with this test you know. And now they're treating the test result with a horrible drug. I hope I told him I would never like.

So when you're talking about just a couple last questions here and we have to probably say good night. But, when you're talking about, let's say, someone with a family history of dementia and they're so they don't need to lose weight, let's say they're relatively healthy weight.

This is not a weight loss strategy for them. Are you able to talk a little bit about what type of dosing you're like? We're talking about less than starting dose here is this one.

We're getting into this concept of microdosing like microdosing right. Yeah. You'll all these people are making this big deal teaching courses on microdosing.

Microdosing is nothing magic right. It is really. So in my mind it's, you know, probably a little bit more is better. So we can't say, okay, take the very lowest dose.

We don't really from the studies know exactly because and release that data yet what, what dose was the one that really showed the protective benefits.

And we have more of that data. We can sort of say, okay, it's 0.25mg or whatever. But what I do with people is I sort of put them on, you know, if you kind of look at the lowest dose that typically is effective for, for general metabolic health, but not weight loss is probably getting up to about one milligram a week kind of dosing.

So what I do is I dose person at one milligram a week of like semaglutide. You can use a little bit more of juice up if you need to. But and then if they have any side effects at all, if they're like my I still feel like he and I don't feel like drinking and I back them down increment.

I say, okay, let's go to half, let's go to, you know, point five milligrams, of that drug. So, so until we know we have all that final data and say, okay, point to five milligrams, is is that the best dose?

My gut feeling is fine. Sort of that that that that sweet spot that's that's high enough with having zero effects. Like I take, I take about one milligram a week of, some of the time, and I don't feel anything right.

Optic nerve blindness report and how to interpret the risk

I'm still I because I don't need to lose weight. I'm still hungry. It maybe I you know, those you guys have done semaglutide and I've done a, you know, full course of stuff.

I would I do everything I tell my patients to do. That's the lingering effects. Like, honestly, yes. You know, I used to love chocolate, you know, and, and for some reason, ever since I did something, I don't really I lost a lot of weight on a weird thing.

And I never broke 2.7. You know, like, I lost the lion's. Yeah. So, yeah, it's easy, you know? Why lost you? Probably something like.25 milligrams is a good enough dose for you for, like, your brain right now.

Like, let me know I to to go up to like higher does the 2.4mg does. But I didn't really want to lose much weight for a brief period of time. But it was really interesting to me that not the sort of change in my brain chemistry.

Not obviously, because I'm addicted to, like, chocolate and coffee, too. Like, I loved coffee. I still drink coffee because I. You know, I think it's good for me, but but I don't crave it anymore.

I used to love coffee. I would, you know, like, really want to go get my cup of coffee now it's like a little different. It's kind of weird. The way through noise.

And I think we hear this from people all the time. Like, it just shuts down the noise, that conversation in your head as you're eating your breakfast.

Yeah. What am I going to have for lunch like? Oh, I like, you know. Oh, and actually I can have a snack before that for my snack. Oh, I know, I've got that really cool banana bread sitting in my cupboard where I put it, like, whatever it is, it's this constant little chatter about what are you going to eat?

What are you going to drink, where are you going for dinner? What are you doing? And when and for some people, when that quiets down, it's like all of a sudden it's like, oh my God.

The voices in my head have stopped. Like, you just feel. Yeah. You know, and that could be at a dose where you're not even losing weight. Right. So I would say even like my, my, my, my one milligram dose, I don't lose weight alone, and I can't speak.

I feel good, but I do have not that food noise. I, you know, I don't feel like I need to overeat. I don't crave foods so much anymore. If somebody you know has a dessert, I can have one bite and go again with, yeah. So even that lower dose.

But like, that's why I think the dose is going to be very individualized. It's going to be finding that dose of for you 0.75. So you sort of titrate.25, you know,.5.751.

And then if at any point they're like, okay, I'm not hungry and I'm losing weight, then we back it down from there. So like when you like 2.5, you were like, okay, I'm losing weight.

Oh you microdose microdosing. It's going to be now back in the down I think five, seven, five weight than I might have been there for a month, which is nice.

Point five for me. That did it. And and it was very good. But but I'm but I'm. Yeah I get you. That's where I kind of appetite's a better it's a better one for me.

Was better for you. Yeah, yeah that's true a lot of people I don't you know, semaglutide isn't my stuff. So, so I well, I use it primarily because it's cheaper.

Again, the brain says, well, I'll be done with the GP's. I think the reason to go to the GLP tip, the to the upside is because for you like getting the side that profile, you know, so when I say should we, should everybody be on a low dose shop?

That's why I say maybe so. Because because I don't think we're going to I don't think we're going to see any of these horrible effects that we're talking about. The blindness.

It just wasn't it wasn't seeing it. Those kind of now, I guess I don't know that for sure if I'm on this tour for a really long time, should we start seeing those same effects?

We don't know. We don't, you know. Yeah. And I think that. Yeah, I think where what's interesting is in a world where people are being assaulted, if you will, like being faced with hyper palatable foods, chronic stress, all this is it possible.

And this isn't going to be for everybody. I mean, look, we see lots of people that who are really well regulated. But in a world that is really pushing dysregulation of one kind or, and or another, you know, with any like, we'll get to a point eventually where there's this range of of uses for different purposes, for different populations.

But the last question I wanted to ask you, because I think this is something that I've always wanted to ask you. And every time we run into each other, I forget.

And I think this is an important one, because there are a lot of people out there right now who are either they they say they're microdosing their groups daily or 2 or 3 times a week, or they're mixing and matching.

They're doing some of this one, and then they're doing some of that one the next day, and then they're alternating do. What are your thoughts on this?

Like.

Microdosing strategies and formulation preferences

If you're looking at microdosing, probably a small dose more consistently is probably better, right. And yes, Obviously for weight loss you know as much.

But the half life profile is probably in a more than once a week, maybe a little better way to get on these lower doses. I think we're going to start seeing two where we're seeing these microdosing coming out in like sublingual forms and things like that. I think.

I think where it starts, you know, I know a couple companies now who are doing pretty good job gains optional is helping more folks, which those are probably going to be because their their absorption is going to be lower still microdose at a, at a more regular basis.

So I do think and I even I use these drugs most for most of my patients, 2 or 3 times a week basis when I'm microdosing, I do think if you look at the half life for what we're trying to do for like a brain effect, it probably is a little bit better to do that than having this kind of drop off.

And yeah, so if we want to keep a more steady state, low dose in there and then as opposed to, well again, it's more massive. Just so pressing the brain active.

Rob yeah, that makes sense. So I do think the problem is could be made to that. Yeah it's more of a hassle right. To do injection you know. And so I think compliance still we're still getting a benefit.

Once we get compliance that way then that's going to be better whether I get compliance from. But people are willing to do it. Yeah in different formulations okay.

That's interesting okay. Again every day is going to be all right. Well, I think we've we've been around been around the, the land of GP's quite dramatically today.

Thank you so much for your time as always. And is there maybe just let people know where they can find you and learn more about you. You've got some incredible Boulder Longevity Institute.

Tell us. Yeah. So we have our clinic, our clinically vulnerable, our Longevity Institute, where we do, you know, all kinds of brain scanning and a lot of regenerative orthopedic stuff.

When I come here, it is a great place to be. Nice is in every virtually all over. And then follow me online at Doctor Yurth. And you have the institute, we have a teaching academy called Human Optimization Academy.

If you go to Blyton Academy, we have courses on there. We do Q&A days every month that are amazingly fun. People ask you. I know people, and now there's more and more doctors who are listening on I.

Yeah, they really push you to. Yeah. So, so so that's that's fun. So yeah join join the academy guys. It's inexpensive and a lot of information there.

Where to learn more and closing remarks

So yeah. And continue to keep learning so that we can keep the noise from all. And I would encourage you guys at the very least to follow Doctor Yurth on Instagram because the, the the just the information you share there is golden.

I mean you come across a trend or a this or that. Like you, you do such a nice job. Yeah I've really tried to stay kind of scientific and what I post in there and on YouTube guys, if you want to find YouTube, I'm, I try post there to for some longer reels on the because the one on an ad and things like that.

So thank you so much. Thank you so much.