Metabolic Health Basics

Well. Hello, everybody. Welcome back. It's my special honor and excited honor to have my co-host, actor Rita Marie, here with me. She's beaming in from wonderful Austin, Texas.

How are you today? I'm doing wonderfully. I'm so excited to be here with you, Joe. Well, you're a very, very talented person with a lot of academic credentials and a big online, practice that everybody will be familiar with by visiting your website and all.

But I want to talk to you today about something. I think you're the only person going to really emphasize you. We're hearing a lot in the media about metabolic health, cardiovascular cardio, metabolic health.

And you often talk about insulin, metabolic health, cardiovascular diseases. This is a heart disease, seminar. So I want to go right there. I come to your clinic by telemedicine, and I tell you, I want to know if I'm one of the 7% of Americans that's metabolically healthy.

More than 93% I read about. That's not metabolically healthy. What are you their questions? Are you going to ask what lab tests might you run to help me figure out if I'm metabolically healthy?

I want to be in that 7%. Yes. So does everybody write risk? Reduce risk of heart disease, stroke, you name it. It's reduced risk when you get your insulin and your blood sugar under control and you're metabolically healthy.

So what would I do? I would ask them lots of questions. Typical very comprehensive health history. But some of the questions I might ask related to this specifically would be do you get cravings for sugar after you eat a meal?

Do you feel like you have a slump at 4:00 in the afternoon that you have to reach for candy or something? A snack or coffee or something to get your energy back?

Do you feel tired in the morning, even after a good night's sleep? Do you have a little extra weight around the middle? Even if you're perfectly normal elsewhere, but your belly is starting to grow.

Those are some of the questions that I may want to ask. I would also be looking at specific numbers. Are they looking at their fasting glucose. And I want to see that fasting glucose in the C 8075 to 90 range.

And then I would be asking them about their fasting insulin. And most of them would look at me like, oh, I've never gotten that before because most doctors aren't testing it.

And I think it's a huge, huge mistake because the elevation in insulin is a very early marker of metabolic imbalance. And it's a very early marker that you're heading on the path towards insulin resistance, diabetes, which again puts you at risk of cardiovascular disease even before it becomes a diagnosed condition.

So those are the things I would be looking at. And of course I'd be looking at what's your hemoglobin A1, C. But the fourth thing that nobody ever talks to them about in the doctor's office is what's your postprandial glucose?

What's the peak of your post? Praying ideal glucose. And what that means is within the hour, probably hour ish, after eating a meal, how high does your glucose go?

And that's a huge marker for metabolic imbalance, metabolic health and disease or disease. And the higher risk for cardiovascular disease. Well that's a lot there to start with.

Thank you. How much of that one hour postprandial post-meal blood sugar elevation is which foods you select? I

would imagine the handful of Skittles that say, 300 calories of Skittles might work different than 300 calories of an apple.

Is that sort of true? Yes, yes, and it'd be very different from 300 calories of avocado or nuts received. So they're all in a different category. And depending on the person's genetic makeup, early diet, if they, like me, had an early diet consisting of Skittles, if they even existed back then, or M&Ms or Snickers, or or, Kool-Aid, which I grew up on and white pasta, you know, three times a week because it was inexpensive and we had a big family and had to feed them, then they're going to respond differently later, even to the Apple.

Now, the apple is a perfectly great food as we know it, right? And sometimes people get themselves into metabolic trouble, where even an apple raises their sugar.

Not quite as high as a Skittles. I've never seen an apple raise it as high as candy, but it can be definitely problematic temporarily while they're regaining their metabolic health.

So the other factor I would, understand is that that rise in blood sugar after a meal at one hour is also, in part, what we're talking about. Are you insulin sensitive, where the blood glucose is quickly exiting the blood into the tissues and muscles?

And are you insulin resistance? So that's also true. Absolutely, absolutely. And going back to the Skittles, right. When we do like the standard glucose tolerance test in the doctor's office, and they often do these during pregnancy, women go in, I want to see how are they responding to glucose.

They give them sugar sirup, basically, you know, for sirup that's in Coca-Cola and Pepsi and all that. They give them a crazy dose of that and watch what happens in a person that is totally metabolically healthy, that they're not eating or drinking that sort of food on a regular basis.

They'll go up and down right away because their insulin response is perfect. But in the average person who eats lots of refined foods, lots of sugar products is underage, tremendous amount of stress because that also affects all this, not just the food.

That person is going to have an elevation and then elevation may last for a certain amount of time. So that's a good sign. Not that I'm saying anybody should be eating Skittles or drinking, sugar water, but a perfectly healthy person who has good genetics and has had a good lifestyle and is eating well and taking care of themselves.

Lots of antioxidants, lots of plant based fibers. They're going to have a very different response to the Skittles than the average person does. It makes sense.

Yeah, it makes total sense. So I come to your office and I send you records, and you notice my fasting glucose is 118 and my insulin is 21. And, probably didn't go through a two hour glucose tolerance test.

I wouldn't have done it during pregnancy. And there doctors that still ordered that. I got a feeling you're going to after all the careful questions you do, you're going to whip out, your prescription and write me for a continuous glucose monitor.

And a lot of people listening have never worn one. And in my clinic we do not use them a lot. You're very expert at it. You. I think you usually have one on your right arm or your left arm.

And that left arm. Is on the left arm. Yeah. Tell us you know even what they are. What is a CGM? Continuous glucose monitor? A continuous glucose monitor is a a device.

It's got a sensor and it's, it's second to not the bloodstream but the interstitial fluid. And it's a good estimation of the amount of glucose in the blood.

And you wear it all the time. I mean, they, they last for like ten days to 14 days, depending on the brand. You got.

And you wear it continuously. And you can monitor what various foods and what different stressors are doing to you. And.

You can see how well your body is metabolically flexible.

Using CGMs to Track Blood Sugar

We want metabolic flexibility. We want the body to be able to eat something, come right down, get in the range of optimal. And I could talk about that because, my belief is it's very different and it's based on science based on research than what most doctors, even diabetes specialists, are telling people is the best range to keep it in.

They'll say, oh, you should never go above one. Well, it should be at one 42 hours after a meal. I say it should be Bill, same as it was before the meal at two hours after the meal. And that's what the research bears.

And it shouldn't be going up much above 110. After you eat a meal. If it is, then you're in trouble. You're eating foods that are causing your body to go into this emergency mode because there's too much sugar.

And over time, you're going to develop insulin resistance, potentially diabetes. And even before you develop insulin resistance, there's the risk. The cardiovascular risk is there for a whole number of reasons and the ways that insulin performs in the body.

So we where this we get a sense from the person which foods, which stressors, which TV stations they're watching and getting stressed out are causing their glucose to go high.

And then we put them on a plan. I usually put them on a 30 day plan to eliminate everything that got their glucose too high. During that first period, and then we go back and check again.

And people are so much healthier and their markers are better. And if you were to do a before and after test, you'll see huge, huge, huge improvements.

So again, I want to assume that, our wonderful viewers have never worn one to they have this cancer with you. Are they talk to their own primary care and or did somebody write a prescription and the insurance companies participating and covering the cost?

Are we referring them to a company and they're going to pay cash to get one of those little things. More and more insurance companies are starting to pay for them.

The insurance will not pay for it. Generally. It will. It will if you're a type one diabetic and you're uncontrolled, and the doctor says that they'll normally pay for it even to a lot of insurance companies aren't paying for them for type two diabetics, sadly, and for the average person who says, hey insurance company, I want to save you the trillions of dollars or my contribution to the trillions of dollars you're paying for diabetes care.

Just give me this glucose monitor. Some of them do, some of them don't. Any any prescribing physician can write a prescription for it. And for people who don't have a doctor who will write this prescription, there are several companies out there that you can go to.

If you pay a little bit more, you pay out of pocket for cash in cash, and you get somebody under them that's writing the prescription for you. Technically, and you're able to get them the monitor.

The caveat is, if you are type one diabetic, most of these companies will just say no, you know, go to your own doctor. We're not taking liability for that.

But they most people and the average person who has no diagnosed conditions or somebody even with type two diabetes can get that through these companies.

And there are several companies and if you want me to name them, I will go. Read name them. Yeah. So there's levels. That was I think the first one that started this.

And then there's one called nutrition. Right. And there's their health and there's one called January I, I don't know if it's still in existence, but it was you know, there's all kinds of new people coming in and they basically you go to them, they give you the the CGM, you pay for it.

They're they're higher than you would pay if you had a prescription from your doctor. Many people who get the prescription from the doctor don't get it covered, or sometimes they'll go to the pharmacy to get it filled in the pharmacy.

Oh, we have a coupon for that. And they'll give give a discount especially for somebody who's on Medicare. Okay. So I think the next question our viewers are going to ask is how that little disc get on your arm and why is it staying there?

How big a deal is it? Is it. Yeah. You know, phobic people a big deal or no. Interesting. I just put a new one on this morning, so I should have waited and did it right here. I could have done that.

And in fact, I'm totally willing the next time to do that and give you the video. It's basically a little device. It's a little applicator. You hold it against your arm and you give a little tap to it, and it it's a quick because velocity.

Velocity gives it the, fit needs to get it because it's a very thin filament. It's not even a needle. And on its own, there's no way you can pierce the skin with it.

But the velocity helps it. There's no pain. If there is pain, occasionally there might be pain. It's like a little neck. Like you just got a mosquito bite or, you know, pricked into some little pin or something very, very comfortable, very, very easy to install.

Takes like 10s. And you can work out shower. Can you swim? Yes. I, I'm a swimmer. I'm a workout her I workout with it, I swim with it. I go in the ocean with it.

I go in the hot tub with it. You don't want to be in too hot a water for too long, right? So it. Because temperature makes it read wrong, but it only makes it read wrong for a little while, so you'll know that if you've been in, you know, hot, you know, heat for a very long time, or you had an air conditioner blowing on it for a while, but you may get a false reading the other way.

You may get a false reading as if you take high doses of vitamin C. Yeah, I actually found that out. I've only won one a few times, but I did go and get an IV vitamin C drip and my monitor said like 650 glucose until I went and read that glucose and vitamin C have very similar structure, structure.

The sensor cannot tell, but most people are taking none or low dose oral vitamin C. So then I eat my bowl of oatmeal and raisins and walnuts and cinnamon and I made it with soy milk.

How do I know what my blood sugar is? I've got the sensor on from one of the companies. Do I go over to my smartphone? I got an app. Yeah, you got an app on your smartphone.

And, the newer ones are all Bluetooth connected to the phone. Used to be you'd have to hold the phone up to your arm and it would read it. But then you only got the readings, but you saw what was in between, but you didn't get the discreet readings that that point.

Now I can just open it up, let's see if it's, Yeah, it just finished warm up, and I can just look at it. It'll tell me what my blood sugar is. Okay, that's pretty simple.

Yeah, and it this one, I think you said use Dexcom seven. This one is the Dexcom seven. I've used them all. I've used the earliest Abbott's and the 14 day added to the ten day Abbott.

And I've used the Abbott two. The Abbott three. That's the Freestyle Libre. I've used the Dexcom G6 and now the Dexcom G7. And there's pros and cons to each one.

And this will stay on your arm ten days. This one is ten days. Right. And there's an adhesive. Let's see if you can see it surrounding it okay. That holds it on.

And they say come with these little bandages that you can put over it. The fit the right size to it. And a lot of people wear those. I, I found the bandages fall off long before the, the thing wears out.

So I don't bother with it anymore. With the phone app alert the person using it that the ten days is up. Yeah. Oh yeah, it'll beep, beep beep. Your sensor is about to expire.

Put on a new sensor. You know, also alert if your glucose goes too low or too high and you can set the ranges, but you can't let the low end of the range is 55.

It's the lowest you can put it out. So if your glucose dips into 55 below 55, it will alert you. Big beep even if you've got your phone turned off. Same thing if it goes above the high end and you get to set the high end.

Well, that's pretty simple. And then ten days from now you're going to throw that device away. And if you want to, you're going to have to have a whole brand new one.

Have a new one. Yeah. If I do. Do you have an idea? I mean, I used one of those companies. It's been a couple of years, but, if to do a month's worth of monitoring, do you think it's because.

Yeah, I would need more than one device to cover a month. It's going to cost roughly 200, $250. Roughly 200. Yeah, yeah, actually, I got a deal through.

And another company I didn't mention is Cygnus, and they specialize in the Dexcom. And the reason I got the Dexcom is because they had a special a couple of years ago, and it was like $700 for six months worth, which is a very good deal.

Right? That's a little bit over $100 a month. So it depends. Shop around, look for coupons, etc., etc. but I would say on average around $200 for a month.

Now you've been using a continuous glucose monitor for about how long. I don't know, 6 or 7 years. So, you know, you're a plant based whole food human.

You're a work out there. You already told us that as swimmer told us that you probably aren't very prone to insulin resistance because of your diet and your body build and the rest.

So what have you learned? Maybe it's stuff you learned 5 or 6 years ago, but what's different about your diet? I mean, what are the practical steps? Doctor, to learn to do?

Because you're talking about very tight targets for fasting. Blood talking, tight targets. And for certainly peak postprandial post-meal blood sugar. These are tight targets.

So how have you modified your diet to try and reach them? Most of the time. Yeah. So going back to me, having a low risk of insulin resistance, but because of my genetics and my early Kool-Aid and sugar eating, I have a high risk.

And I am very my glucose is very sensitive in spite of being on a whole foods plant based diet.

Diet, Fruit, and Supplement Strategies

So I control what I eat within the Whole Foods plant based diet. So for me, eating the first way I discovered that I

had this issue was my sugar shot way up on pineapple.

And you say, okay, pineapples, sugary food, but not everybody shoots way up on pineapple. And I shot like into the one 60s on pineapple. And I started to observe what my what I felt like during that period.

And so I wasn't hungry before eating the pineapple. I was doing it as a test. I had a bowl of pineapple and within like 20 minutes, my sugar's like going way, way up, like 135 within 15, 30 minutes.

And I'm like, Holy cow, that's crazy. And I was hungry all of a sudden I was like, famished. But it wasn't true hunger. I realized later it was glucose dysregulation.

So as my sugar was high, that sugar went high because it wasn't getting into my cells. So my cells were perceiving this dysregulation, I would say, between the glucose in the in the blood and the glucose in the cells.

And I was really, really hungry until it started to come back down and it started to come back down about an hour and a half later. And then the hunger went away.

And I recognized that all these people who are like, starving after meals, it's glucose and insulin dysregulation. All right. So practically, do you eat pineapple or you avoid pineapple or just eat lesser amounts of pineapple?

That's a great question. So what I do is I've figured out how can I eat pineapple and make it work for me. So the way I eat pineapple is I make a big salad or something.

That's lots of greens, lots of veggies, lots of plant fiber, a green smoothie, something like that. And I eat it along with the pineapple. I don't blend the pineapple into a smoothie because when you blend, you break down the fiber and the sugars release more rapidly.

So I'll have some bites of my salad or sips of my green smoothie, and then I have a few pieces of pineapple. So I've determined by using the glucose meter how much pineapple I can eat and still maintain healthy blood sugar levels.

And what do I need to eat it with? And that's what I teach people to do to not necessarily get rid of the foods. Yeah, the Skittles and, you know, the M&Ms and all that should go, but not necessarily to get rid of the Whole Foods, plant based healthy foods that are loaded with with nutrition that raise their sugar, but that they learn how to eat it in combination with other foods to maintain healthy glucose levels.

Now somebody else could eat pineapple and not get the same spike. It's their microbe biome, their genetics. Yep. Microbiome genetics. And you know, their whole metabolic health system going going from, you know, childhood on.

You really have to be a biohacking self experimenter for those listening to you who are going to go rush and order one of these with one of the companies, or through their medical team.

Is there any food? Like I've heard many people criticize grapes? I will admit I was in the grocery store yesterday. They're big display of organic red grapes, and they're sitting in my refrigerator right now. And, but are there any foods you've just learned I have to avoid?

Are you who've found a hack to let you get these wonderful whole food, plant based, colorful foods in your diet and have good blood sugar control? I think most of them, I can get the control if I'm taking care of the rest of it, if I am exercising, if I am sleeping, if I am controlling my stress and meditating.

Grapes tend to be a high glycemic fruit. And so if you take a handful of grapes and you sprinkle it on your gigantic salad, which I'm sure you eat on a regular basis, then you're probably going to have no problem, but you just have to watch it.

I had somebody who had this was crazy. She had been monitoring, monitoring. Everything was good. So she decided to throw a handful of raisins, which are dried grapes, on her salad, and all of a sudden she felt this hypoglycemic feeling that she used to feel.

And she went, oh, now is the time to check my blood sugar. And this was before the CGM were available. She's checking it on her finger, expecting that her glucose had gone way down, and she was going to find like a 65 or something.

It was 210 just from adding the same salad. She always just from adding a handful of, of raisins to it. So everybody's different. And that's why I think it's individualized medicine, individualized, food plans.

And we just need to really not treat one size fits all and say grapes are no good. Don't eat them. No, they may be fine for you and they may be fine for you in the mix of a salad, or with a, you know, a main meal that's high in fiber and minerals.

Just a couple ask questions is a popular Instagram site that teaches hacks to use when you wear your CGM. One is a shot of apple cider vinegar before a meal.

Do you think it works? Have you tried it? Do you teach it? I think that it can work and it works for some people. And the exception I take with that Instagram site who says that is?

They say, well, if you're gonna eat a cookie, make sure you take your shot of apple cider vinegar beforehand and you can get away with the cookie. You know, I don't know that that's good advice.

Because if there's still a mess happening and inflammatory mess happening from the cookie. So, yes, I think apple cider vinegar can be very helpful in correspondence with a whole regime of good food.

Whole foods plant based is my recommendation. Good fats, whole foods, plant based fats, nuts, seeds, avocados, olives, things like that that work for you.

And, lots and lots of greens. Lots and lots of veggies. Okay. And last question. You're well trained in supplements. I think I'm reasonably well trained.

Do things like, berberine, dihydrogen, berberine, bergamot, senna, Greek traditional blood sugar stabilizing supplements, things you use, things you've seen, improve the CGM response.

Absolutely, absolutely. They work and work different ones. Work different. My talking mushrooms. Another one. They actually help chromium and magnesium as far as nutritional supplementation, because they're involved in the process of importing the sugar into the cells, escorting the sugar into the cells and making those receptors more receptive.

So yes, absolutely. Yes. Those where appropriate. Totally not instead of though not instead of recommending a good diet. And that's I think the supplement craze is people want quick fix.

They want to just take those things and think they're protected. I think I think that that's a misnomer. We need to change the diet. You need to do the work.

All right. So hopefully everybody wrote down to find out if you're metabolically healthy. You want that fasting blood sugar, that fasting insulin of course a hemoglobin A1 C and maybe accessing on your own or through your doctor, CGM and then all these strategies you told us about, what's the least amount of time somebody should wear CGM to, you know, start drawing conclusions.

Do you think a month's enough is two weeks enough? You know, people want to save money. So in that case, I'll say at least do it for two weeks. But eat your normal diet in that two weeks, don't try fixing your diet, because then you won't get a sense of what in your diet is causing you have a problem.

What in your sleep? If all of a sudden somebody says, I'm going to put a CGM on, I'm going to eat perfectly, I'm going to sleep every day, I'm going to meditate and exercise.

And that's not what they were doing. They're going to get some good numbers and they're going to think, oh, I'm metabolically healthy. I'm fine, right. All right.

So that's what I recommend. So two months I like a month, I like to have two weeks where they're just doing their regular diet, getting a sense of it.

And then at least two weeks where they're making those changes and making those swaps. And then they get to see the difference, ideally two months. Okay, this has been a pleasure.

I just have to comment. Entering your probably home study and seeing 1000 bucks behind you is pretty impressive. I think a lot of them have little pieces of paper stuff they knew prior to taking notes and things you want to do, remember?

And I want to shout out that book that's over your left shoulder, Unstoppable Health that you wrote. I've read it. It's excellent. Everybody wants to go deeper on this topic.

Go to Doctor, Read Emory's website, and I would give a strong endorsement to read her book. Good stuff. We need to be a metabolically healthier community.

And this, doctor can do a lot to get us there. So thank you for taking time and sharing and being my co-host. Thank you so much for inviting me to be your co-host.

It's a pleasure and honor. I love it. Right. Thank you. Thanks. Well. Hello, everybody. And another fantastic episode of Reversing Heart Disease Summit.

And I get to do this one with my joyful and wonderful co-host, Doctor Rita Murray. Good day, doctor Rita Murray. Good day. It's always a good day when we get to talk about fun stuff.

I agree and it turns out we learn that we share a lot in common in our practices. Although you're in Texas, but you reach all over the world, and I'm in Detroit and Florida and I reach all over the world, but we find out that we both are fans of a, knowledge base called galectin three and an approach called modified, such as pectin or packed salt.

And it's probably a topic everybody listening right now should know more about. So let's dive into it. And, I'm going to talk a little bit about why, as a cardiologist, galectin three came on my radar screen.

And then we can talk about, using practice all in your practice. And I think everybody will be richer and smarter for it. So, galectin, galectin three does suggest there's more than one galectin, but galectin three is by far the most powerful molecule, and it is actually electing Natchez, which is why it is spelled and pronounced the way it is.

Some lectins are harmful. Galectin three may be harmful, as we'll talk about. Some lectins are actually beneficial. Mistletoe. The wonderful Christmas green is used in cancer therapy.

It's also elect. And so we have to be specific. But galectin three a word that most people haven't heard a lot or at all, is a very powerful inflammatory regulatory molecule.

Some people call it the can doctor of inflammation. And again, inflammation is not a bad word. You cut your, knee, you get a bug bite, gets red again swollen, it gets hot.

And a couple days later it's nearly all gone. Are gone. That's inflammation helping us. But Doctor Murray and I both focus on chronic inflammation where it's turned on and not turned off, usually driven by lifestyle, and things like, poor quality diet or obesity or sleep apnea or dental health or, chronic inflammation, chronic infections, Lyme mold.

So chronic inflammation is not good. And galectin three is this conductor that sort of orchestrates the whole cascade that ends up in harmful, final events.

And what are some of those harmful final events? Well, they include both the damage and inflammation can cause in blood vessels and tissues in the heart muscle itself.

But the most scary one is actually the term fibrosis. Fibrosis is scar tissue. And, you know, if you've ever skinned your knee bad, that, you know, in 25, 45 years later, you can still see a scar.

I got one right there. I think I was about five years old. Scar tissue is permanent, and if you're getting fibrosis in the muscle of your heart or other important organs like the kidneys, it's permanent.

And that's what galectin three really drives. So we do not want galectin three to be, abundant and access it does some other things due to the heart system.

It can increase the thickness of blood vessels, particularly the aorta. And thick blood vessels are stiff blood vessels and stiff blood vessels don't respond youthfully, and they drive blood pressure up and they drive more organ damage.

And I think people will be interested. And a couple other things that we've learned in the science of galectin three that, it's terrible, but it actually increases fat storage, galectin three.

So it promotes obesity. And we know how much that is a enormous problem in both our practices and across the Western world. It promotes fatty liver disease.

And lots and lots of people have heard the term nano. They call it fatty liver disease or hepatic ptosis. But with people getting CT scans and ultrasounds, they so commonly say nowadays, fatty liver disease is, recognized.

And the imaging or blood testing galectin three fuels insulin resistance and insulin resistance, certainly creates, blood vessel pathology and heart pathology.

And finally, and certainly very importantly, chronic kidney disease. Galectin three can scar the kidneys. So I think everybody by now, after just a short introduction, will say, how do we know if we have a high galectin three in our blood and our tissues, and what do we do about it?

And there has been a blood test for at least a decade, or targeting Quest Lab, LabCorp, which can measure your blood level of galectin three. I've ordered it thousands of times at my clinic, and the way I get the results back, it's marked in a normal range and an intermediate range, or in a markedly elevated range.

And where it really is most markedly elevated is people with congestive heart failure. Very serious cardiac problem, where fibrosis, may be the reason we have a weak heart and we can't return that heart to normal strength in all cases.

In some cases we can using integrative approaches, but not in everybody. So, in heart patients drawing galectin three as a blood test, a relatively inexpensive blood test in a widely available blood test may be very important.

And then to shift gears and get it over to my, wonderful co-host, Zachary Murray, a very, very bright scientist physician named Doctor Isaac has has been working for decades and identifying if there's a natural inhibitor of galectin three, how good that would be to find something that prevents all of this list and cascade this orchestration of chronic inflammation and fibrosis.

And it turns out, when you throw your orange peel away or you throw your grapefruit peel away, the inside has that white puffy material, and that's called citrus pectin.

And not too many people eat it. But it turns out it's rich in chemicals. And one of the chemicals is called, packed us

all as it's commercially known.

But if you just were to say I'm going to start scraping the inside of my grapefruit and get that white stuff out and throw it in my smoothie, and I'll block my galectin three fibrosis pathway, it doesn't work because, citrus pectin is actually a large molecule that does not get absorbed from the GI tract with any success.

So Doctor Labs and others, and now a company called Echo and Eugenics have for years been taking that pectin, but they modify it and they modify it in a way that makes it smaller and absorbable.

So instead of being 100 to 300 kilo, Dalton sets a number. It's less than 15 kilo Dalton. So bottom line is it's a powder or a capsule that has the inside of those citrus pectin, but it's modified for absorb ability.

It's a complex fiber. It's a low molecular weight citrus pectin, and it's easily absorbed by the GI tract. And it is a galectin blocker. So if your galectin wants to attach to a cell, well, there would be a fat cell or a hard sell or a cancer cell because this pathway is very active in cancer.

And you want to block it, you can block it with modified citrus pectin, MCP it's often abbreviated. And you can start to drive inflammation down and you can drive.

Many people have heard the term cytokine storm, which we heard a lot of during the peak of Covid down. And you can drive the development of biofilms, which trap bacteria and hide them down, and you have an impact in sepsis, in fibrosis, in cancer and in heart disease, even in an auto immune disease.

And I'll just say one last thing. And then hand it over to the clinical aspects. There's that uniquely modified citrus pectin available as pect us all from echo eugenics likes to trap heavy metals.

It likes to trap arsenic, it likes to trap led, it likes to trap cadmium, and it traps it and it removes it from the body. So there is a chelating aspect to, taking pect us all, and we know we're all exposed to mercury, lead, arsenic, cadmium, and the whole range mercury and the rest.

And they're toxic, and they cause their own set of diseases and inflammation and brain and may promote to, serious cardiovascular disease. So that's a little background I heard about packed us all and modified citrus pectin probably about a dozen years ago.

I have it available in my clinic. I have recommended it to patients, particularly those that have that high galectin three blood level. But others have taken that just for wellness.

Understanding how important a molecule this is. And that's, you know, kind of, leading up to Doctor Rena Murray. When did you first hear of practice? All as an option.

Modified citrus pectin as a supplement that is widely available and can be used in your clinic. Absolutely. So, probably my guess, probably around 12 years ago.

And I first heard of it through Doctor Eliza Diaz, and, it was for heavy metals because we feel like a lot of people with heavy metal build up and a lot of people with the mouths full of mercury and eating commercial foods and eating a lot of meat, animal products, when where the lead accumulates in the bones.

And then they're making bone broth, which is a popular thing these days. But a lot of bone broth is contaminated with lead because the lead accumulates in the bones and it's extracted.

There have been numerous studies that show that, so I started using it for that. But before I get into how I clinically use it, I would love to ask you a question.

Can I ask you a question? Why not? We're here to have a conversation. Okay, good. How does the galectin build up? Like we know when people have elevated LPA, right, that there's a genetic component and it's not as much

controlled by lifestyle.

Whereas we know that when people have high oxidized LDL or LDL or other inflammatory markers, CRP, homocysteine, that there are dietary and lifestyle factors that contribute to that.

So how does is it just random? Is it genetic, or are there particular lifestyle factors that can lead to the buildup of galectin three? Yeah. Well, as far as I have read, in the past, galectin does have a gene that allows it to be produced.

And, you know, we'd rather the gene be relatively inactive. It's the classic epigenetics, the environment that that gene is exposed to, oral health, weight, infection, particularly the most severe form of infection called sepsis, male, arteries that are on fire because of advanced atherosclerosis.

And I'll, if I remember, I think it's chromosome 14 that has it, but it's there to be made, you know, and it's that process. It's in our DNA and then has to be transcribed by the messenger RNA, then go over through the cell, since it's a protein to be made, in the endoplasmic reticulum.

I feel proud of my medical school education coming up this pathway, but it's just a matter of, what might be signaling that for it to be made in cells and, you know, we know that it's a biomarker.

It's a cardiac biomarker. A lot of people have heard of high sensitivity C-reactive protein, as a, important cardiac biomarker of inflammation. But people need to hear about and ask, ask your cardiologist or figure out how to order it on your own through some of the online labs.

Yeah, I get a galectin three level and it can be made in tissues throughout the body. I would predict that probably the liver is one of the more important, since the liver makes so many of the other inflammatory biomarkers the high sensitivity C-reactive protein, the IL six.

But exactly how that gene can attack sepsis can detect, you know, the, inflammation of obesity, is amazing. So we're not actually shutting off the production of galectin three at this point.

We're blocking its activity, you know? So further, I'm sure a lot of research down the road. There are other actually ways that are being created to filter galectin three out of the body with, almost dialysis, like a protein.

But for now, we know we can block it from acting. If cholesterol were in your blood or lipoprotein anywhere in your blood. But it never connected to the cell wall to create a plaque.

It wouldn't be much of a problem. And, us all or modified citrus pectin has that ability to block, you know, the galectin three from attaching to so many different, compounds in the body to cause harm and particularly scarring.

Great. Well, thank you. I didn't know if there was a particular food or nutrient deficiency or anything that have been studied yet, because that's always a great place to start.

Right? But that's always going to be a shout out to a cheeseburger, fries and a malt that I resist, though I don't know that for sure. Right? Right. To blame that for everything.

So in terms of how so? I first heard about it then, and I was seeing people with, with, heavy metals. And the problem is that a lot of the, the mechanisms for removing heavy metals from the body are either very invasive, very expensive, and create a lot of side, side effects, so to speak, that I didn't like.

So, so we have chelation, you know, people go in, it is super expensive, super time consuming. Not doesn't always work. Is what I've seen. And then the other piece was the, like the oral, EDTA and, rectal.

And I was finding that when people do that, they go into horrible detox mode when they're trying to remove things and just very specific protocols for using those, because it also yanks out along with the heavy metals.

It'll yank out good metals like zinc and magnesium, etc.. So I was looking for something. And what I find with the modified citrus pectin, it will take a little longer to go down the heavy metal things.

If we go back and retest the hair, retest the blood, retest the urine. The main mechanisms for testing for heavy metals that took a little longer, but it was much more gentle, right?

And people could use it and then gradually ramp up to full dose. Use it over the course of six months, go back and retest and see where they're at, and then continue or, you know, continue on a maintenance level, because most people aren't not exposed anymore.

Right? If you're no longer exposed to the offending substance, you just yank it out and then you're done. Right? But in the case of heavy metals, we don't just yank it out and then we're done.

So there's, there's a use for an ongoing use, not necessarily the same strategy. So that's basically how I use it in practice. It's also good for yanking out toxins.

Right. So it's a good key later as you said. And it will latch on to the heavy metals and pull them out of the system. But it also does that with some of the toxins.

So if people are exposed, I've worked with people who had worked in various chemical factory type situations, build up a lot of toxins in their system, and it helps to bring those out of the system.

It needs to be taken on an empty stomach in order to do that, because otherwise it will latch on to whatever you're taking. So if you pop in a whole bunch of supplements and take zinc and magnesium and all these other things and take your modified citrus pectin along with it, you're basically flushing out your good metals that you're trying to build up.

So I have them take it, usually have it people take it at bedtime. I tend to like the powdered form just so people don't have to take a handful of pills.

But some people don't like taking powders, so they take the pills. It's innocuous. It doesn't taste bad, by any stretch of the imagination. So it's easy to mix in water and take it.

Don't. If you're taking it at bedtime and you take magnesium at bedtime, don't take it with the magnesium. Leave a good half hour to an hour in between those things, and preferably get the magnesium in, and then take the pack to sub or pack to Sol, and then take the magnesium an hour later.

Those are, you know, great, great reminders. I remembered an article that I read a couple of years ago was called, from A to Z, the role of galectin three.

And just to give people an idea, I found it. It's a published medical research article, but it literally goes A to Z. There's a chart a being asthma, atherosclerosis.

These are diseases where, and galectin three is causing, potentially, you know, fibrosis and damage in targets for modified citrus pectin. So a was asthma, atherosclerosis and atopic dermatitis B was that its blood test C was cancer and COPD D was W is diabetes can be an inflammatory disease.

He was endometriosis F was fibrosis. It causes G was gastritis, H was heart disease I was interstitial lung disease a bad condition. Juvenile arthritis, K was kidney diseases, L was liver fibrosis and was mortality that people that are predicted to die have a higher galectin three level and was nonalcoholic fatty liver.

Oh was obesity, P was pneumonia, and psoriasis. There you go. Psoriasis patients perked up just now. Q was an unusual one called Q fever. I was rheumatoid arthritis.

S was sepsis a very, very serious condition? T was it's a targeted therapy in so many areas. You as urinary tract

infections were abundant. And galectin three V was venous thrombosis, W was wound healing X was what's called the X syndrome of the heart.

Kind of microvascular angina, Y was yeast infections and Z was zoster pain. So I tell you, with everybody listening to this summit, somebody has one of those eight through Z conditions most likely, and everybody should be worried about, you know, atherosclerosis.

And so there are some trials, you know, to go beyond your and my clinical experience that this stuff works. But most of the clinical trials so far are still in the animal model world.

There are data that if you, create a situation of congestive heart failure in animal models, and you throw in modified citrus pectin into the child is a rat, you actually inhibit the damage.

You inhibit the fibrosis. Because that's how it works. It's, great to know that. And, the growing role in stroke, the growing role in actually atherosclerosis, that, there is an animal model showing that you can prevent, you know, this number one killer of men and women by blocking the action of, galectin three, even in obesity, there are rat data that adding, practice of modified introspect into the chow of rats promotes better, weight control, which, you know, we're going to our moon gyros and arrows.

Zenpix. But maybe we had a first consider this pathway. So it just goes on and on and on. And I think I heard you say, do you prefer the powder over the capsules?

I yes, I do. I think that, I work with a lot of people who have digestive impairment and so they don't always break down the capsules and they end up in the toilet.

So I like to get people to do powders and whatever nutrients I can. Plus, with the dose of the, pec dissolve, it's usually the, the high dose or the full dose is about six capsules and people just like another six capsules to swallow.

So put the put it in water, stir it up. Drink it down. It's easy. Yeah. One scoop is kind of the basic, wellness, dosing and the basic and not very sick person dosing, although sometimes it's a scoop twice a day if you're dealing with an adult and there even is a higher, scoop and a half twice a day if you're really dealing with this serious condition, congestive heart failure, I think might be one of them.

Or you're really working hard to make improvements. And of course, like you say, you can add back this all on to any other natural or prescription therapy.

Just separate the timing. By taking practice. I'll take it 30 minutes before breakfast, take an hour and a half after dinner and take it separate from some of the supplements that you're using.

So I think, I think we've done a lot. And, you know, the last part of it is just this toxic life we have that, persistent organic pollutants, DDT, dioxin, microplastics, pesticides, you know, the heavy metals we talked about the BPA, all of these are damaging tissues.

And the fact that and all of them can stimulate galectin three. So since galectin three is that final conductor of this pathway of inflammation and scarring that's gone wild, that's gone in excess, that's gone overboard, you know, the argument to be made to put a scoop of, practice all in your daily program for pretty much everybody can be made without too much hesitation.

Yeah. Yeah. And you know, the thing about it is that and my bottom line takeaway from this talk that we're having here is we need to be testing galectin three.

Most doctors are not testing galectin three. And it's an easy test. You know, it's not very expensive. And all the labs, all the blood labs will do it.

So if your doctor won't do it, find one of the direct access labs. There's plenty of them now in your area. The less you live in New York, and then you're out of luck and have to go to Connecticut.

But unless you know somebody in New York. But New York is a tough state. Unless it's prescribed by your physician. Any lab testing. But other than that, most people can easily get the test done.

And once you do, there's a solution here, either in addition to all the other solutions we've been presenting throughout this summit, right? The diet, the sleep, the stress management, the environmental pollution avoidance, all of that stuff.

But this little simple addition can be very helpful. Yeah. I think that's, an information. And frankly, I did not know that about New York. Unfortunately.

So too bad for people there. And as you say, they might just have to travel to get it. So, yeah, I do find these, self ordered lab panels are identifying lots of pathology in people and sort of bypassing the standard medical system.

And, you know, I think it's going to challenge the primary care docs what to do with 105 tests that their patients bring to them. I think they're going to shrug their shoulders, but I hope that they take the opposite path and say, I'm just going to have to learn this stuff and. Exactly.

Dig in and find what is galectin three and what is lipoprotein now? What can we do about it? So, well, I want to thank you for taking time, my dear colleagues, and, bringing up to date everybody on an important topic and cardiovascular health.

And when we're talking about reversing heart disease, we are really talking about blocking and reversing the impact that galectin three and so many different syndromes.

High blood pressure syndrome. Oh, important important topic. Thank you so much. Activator Mary. Thank you.