Introduction and why insulin resistance matters

Morgan. Let me just say thank you. You and I have talked so much and I really appreciate you coming on to chat all things insulin resistance with the fast like a girl summit.

So thank you so much for being here. I'm excited to be here. Thanks for the invitation. Of course. Of course. Here's here's the problem I'm trying to solve for women.

And it's different at different decade. And the root cause. Here's the challenge that the root cause of so many hormonal issues, whether it's PCOS or it's a woman going through menopause, the root issue there is metabolic health.

Mm hmm. And so you've got all these women that are, like, debating HRT or bioidentical or they're struggling with PCOS without any answer or even fertility.

And nobody is coming to this root conversation that we need to address insulin resistance. Mm hmm. So help us understand where when glucose gets out of control, insulin gets out of control.

How do all our sex hormones get out of control? And how do they affect us at different ages? Because the it's the same root cause, but different symptoms that show up at different ages.

You're right. That's a loaded word. I could take it away. I'll start to unpack it. And then I'm sure you can kind of guide us through the conversation in a way that you think is most valuable and productive for the listeners.

And but, you know, insulin resistance is such a passion of mine is a geriatric physical therapist, because I saw firsthand what happens if you don't take care of it, and that is end stage diabetes.

So we're talking neuropathy, we're talking amputation, we're talking kidney dysfunction, loss of vision, all those things. Heart disease. I like to say heart disease is not the number one killer in America.

It is insulin resistance to certain types of cancers. And Alzheimer's, dementia, vascular dementia. That's what's waiting for you. If you don't take care of this problem.

Now, earlier in life, as you mentioned, women may experience PCOS or polycystic ovarian syndrome. And I had a really interesting doctor on, an OBGYN on my podcast and we talked about this and she said, you know, often with PCOS they go to their gynecologist because it causes reproductive issues.

They're having, you know, irregular cycles or heavy bleeding or painful periods or pain with sex or infertility issues. But really, it's a metabolic problem.

And so we need to be talking to metabolic specialists, not necessarily reproductive specialists, because they're not always one in the same. And so insulin resistance, you know, we used to think of type two diabetes.

I think that's the best example because it's the most direct like called insulin resistance, most directly causes type two diabetes, right? So that is such a great example.

It used to be called adult onset diabetes and it is no longer, you know, so type one used to be child onset, type two used to be adult. And it's not like that anymore because we are seeing high blood insulin levels in children.

It precedes any other metabolic dysfunction marker. So we need to be checking for insulin levels no matter what hormone abnormality you feel like you're experiencing, whether you were in that earlier age division with some

PCOS and fertility issues or maybe in your forties or fifties experiencing perimenopause, maybe you're after menopause, struggling to lose weight, test your insulin.

And that is one of the biggest key takeaways that I hope people get from this because fasting, insulin and specifically what's called it's it's almost like the oral glucose tolerance test, but it's called a craft test and that measures insulin and glucose and fasting 30 minutes one, two and maybe 3 hours after.

So it's a post-meal insulin assay that can predict type two diabetes up to two decades before fasting glucose.

PCOS, fertility, and menopause as metabolic issues

So these conditions. Isn't it crazy? It's so easy to test so easily. Easy. Yes. And are missing decades of potential interventions for people and what happens is the the things compound.

Right so we might start with just high insulin levels but if you don't get it under check, it's going to mess up your sex hormones, it's going to mess up your stress hormones, and you're going to end up with more health problems than you otherwise would have.

So I wanted to just emphasize that this problem is very, very overlooked by primary care physicians. If they are not if they're just Western trained, if they have no integrative or functional background.

What do you think that is? Before we go into, I want to go into what the numbers should be, but from the the place that you and I set, it seems so easy to just there.

You're already getting a yearly blood test. Why can't the doctors say, hey, you're 20 years old, your hemoglobin A1, C or your fasting insulin is too high if you're not careful.

PCOS infertility is coming down the road. Why are doctors not saying that? I think one of the reasons is because there's they're not trained to number one.

And one of the reasons they're not trained, too, is because the pharmaceutical companies are so heavily influenced their education that there's not a I mean, you can give metformin any drug that lowers blood sugar will in theory, lower blood insulin.

But this is not the way in which they're trained to communicate. And so they don't see the value in testing for insulin because they are not the ones providing the lifestyle interventions such as like we talk about all the time stress, sleep, diet, fasting, movement.

You're not talking about those things with your doctor in the 5 to 10 minutes that you're with them, they have time to prescribe you a medication. And unfortunately, a lot of people, they want the quick fix.

They want the Band-Aid. They don't want to deal with the root cause. And if you don't deal with it, well, that's going to be the solution that you're offered.

And so I think one of the reasons that they're ignoring it is because how big medicine is set up is not to incentivize preventative health care. And so testing insulin is a preventative measure.

And I'm I just went through this with my dad and he's type two diabetic and I like ask for your insulin test because you're going in for your agency again anyways and back and forth.

And he never got it because they're like, we can get all the information we need with an agency test. And I'm like. So yeah, so walk us through the tests because the other thing I want everybody to know is what's really cool about this day and age is you can run your own tests who actually don't need a prescription from a doctor so you can go.

There's a lot of online programs at will that you can get your own prescription, go to your own to a lab. They'll draw

the lab and send you that back.

So with that in mind, talk about if and if your doctor did do a CBC on you. Let's pull that out and tell me what hemoglobin a1c should be. What should fasting insulin be and what should fasting glucose be, and any other markers we would look at on our blood brain.

Okay. So we look at a few for insulin resistance and the first that we look at is a fasting insulin test. So this is at least 12 hours of fasting. Ideally, that's going to be between two and six.

Now, normal on the lab that might come back a little bit different. But we're looking at ideal. I like to give ideal numbers because if you're looking at quote unquote normal, in my opinion, you're too close to the borderline levels.

So I like to keep it a little tighter. 2 to 6 on fasting insulin now hemoglobin A1 C we like to see at about 5.5 or less again well below that pre-diabetic range for fasting glucose.

We like to see it at 90 or less. Again, normal is going to be up to 99. So we like to see it a little bit tighter. Those are the three we do offer a fasting insulin test through our website.

You do not need a doctor's order unless you live in California or Maryland. Not available in New York. Those three states kind of have their own regulations.

And so those are three we like to look at Hs-Crp, which is a marker of low grade a chronic inflammation because insulin resistance and inflammation really drive each other.

And so ideally that's less than one triglycerides. We like to be less than 100, HDL is 60 or greater. And that triglyceride to HDL ratio, an ideal world is like 1 to 1, but healthy will take it if it's 2 to 1.

So if your triglycerides are 100, your HDL is 50, we're going to give you a thumbs up on that. And those are the main ones that we like to look at. Another one is called the Homa IRR score, and that's another measure of insulin resistance that uses insulin and glucose.

And we have a YouTube video on that. So if they want more information, they. Amazing. So helpful. So just your what's your website so everybody listening.

Can make. Sure they get that. Totally z philly.com Z I alaikum is our website and we have a really great playlist on YouTube for free about insulin resistance.

And we have an insulin resistance diet starter course which gives all of those numbers plus more if they're looking at their blood panel. Because this happens like we had a client once and she said that her doctor wrote excellent on her blood report for years, even though she was in the pre-diabetic range.

So until you learn, like you look at your own numbers and do your own fast, it's not that hard. But that diabetic is not excellent. So we got to watch out for that.

And I love that you guys offer this as a resource. Walk through with me like just because I think the common person is not grabbing this and it's really, really important.

And I and and one of my takeaways from Fast Like a girl launching into the world has been how many 20 and 30 year olds are either missing a period or they're struggling to get pregnant and nobody's teaching them how to look at glucose and insulin.

So let's start with infertility. What's the time between insulin resistance and infertility? How did those two pair up? That's a really good question, and I'm probably not the best person to answer that just because I'm not an OBGYN But I did have someone on her podcast and I asked her that direct question and she said, it really has to do with how elevated levels of insulin obviously hyperinsulinemia will precede insulin resistance.

So if you have high elevated insulin levels for a high period of time, you will develop insulin resistance. But even just having high levels of insulin can be a stress on your body.

This is one way. There's, of course, more that I probably am not even aware of.

Key lab tests and ideal insulin resistance markers

But if if Hyperinsulinemia is a stress on your body, your body doesn't want to get pregnant, your body wants a nice, healthy, low stress environment in which to conceive and carry a child.

And so that's one of the ways that high levels of insulin can contribute to infertility is just because it's a stress on your body due to the level of inflammation.

The other way is that high levels of insulin can cut. It's a fat creation and storage hormone, so it drives excessive development of body fat if you're giving it too much of the wrong nutrients.

And we know that excess body fat directly releases inflammatory substances, again, driving more inflammation and more stress in the body. Now, as it relates to estrogen, I'm a little bit more familiar with the post menopausal phase because estrogen is actually an insulin sensitizing hormone.

And the fact that, like a lot of women after menopause will gain belly fat because they lose that protection from from estrogen. And so are you aware of any specific links between.

I kind of spoke on a couple between how high levels of insulin can raise inflammation and cortisol, which will create not as hospitable of an environment for a baby.

Are you aware of any other direct links between estrogen and insulin and women, maybe in their twenties and thirties? But this is the way I look at it.

I think everything you said is spot on. And then I would add to that that if a cell is resistant to insulin, it's also resistant to vitamin D, it's going to be resistant to sex hormones getting into the cell.

It's going to be resistant to nutrients getting into the cell. Once a receptor site is blocked, the it can be blocked with a chemical. It can be blocked with too much of a of a hormone like insulin.

It nothing can get into the cell. So once we see a sign of insulin resistance, it's almost like you have estrogen resistance as well, although we don't really use that as as the term.

So that's one piece of it. The second piece that I think to add, again, I agree with the stress going up. I feel like that's spot on. When your body's in a crisis, there's no desire to, you know, to create a baby that makes absolute, absolute sense to me.

But when we start to see that the estrogen can't get into the cell, where that extra estrogen is going to go is into your fat into fat cells. So all fat is is just all the storage for the things that couldn't get in to the cell.

So when you walk into your doctor's office and they're like, hey, you have a BMI that's too high and you're not going to be able to get pregnant. Where my brain goes is actually all that seen as nothings get into you getting into your cells and it's all being stored in fat.

So a lot of systems are going to break down and fertility is one of them. Yeah. And the OBGYN that I spoke to said, you know, estrogen is kind of finicky, especially for fertility.

We don't want it too low and we don't want it too high. And so a lot of times with that'll happen if you have excess body fat, you're going to have and estrogen dominance is what it's called, and you'll have excess amounts of estrogen.

And I think it's it's sad. I mean, I we were able, thankfully, thank God, to conceive our two children naturally without much effort. But we know so many people who have gone through rounds and rounds and rounds of IVF and not been successful in conceiving.

And so how many thousands of dollars in tears relationships that had been ruined because of infertility issues? And if we're talking about basic mental and physical health, a lot of those would be resolved.

And I think that's really sad. And it's it's hard to talk about because it's such a sensitive topic for so many people who are trying to conceive. But if you're trying to conceive and you're not taking insulin resistance very seriously, and that's a missed opportunity for you and your health, I think another thing I wanted to point out, Dr.

Pelz, was that we have to focus on maternal health if we want to focus on the health of the baby. Because recent research is clear that if the the mom's insulin and glucose is high, then the baby's insulin and glucose will be higher.

And so we need to be addressing that maternal health as soon as possible, ideally before conception. So yeah, yeah, great. Yeah. Agreed. And, and I would say that we're not giving moms enough information on how to get their bodies prepared for the pregnancy process.

And we are seeing in our community that when just going through what I'm teaching and fast like a girl, when women start to fast like a girl, all of a sudden they're getting pregnant if it's the woman who's the challenge.

So I bet it's been really fun to watch people cycle get sent back up when you know when to go in and bring your glucose up and when to bring it down according to what hormones are there.

So which is a whole nother discussion, but that's been a byproduct. And it's been helpful to me. Dr. Pelz, I think you were on my podcast a while ago, maybe a year, year and a half ago, and it's one of my most popular episodes and I've I've adopted that.

You know, I've really done what you what you've taught in that book and in that podcast. And what I notice is a tremendous increase in my energy levels.

You know, when I'm fasting correctly, I'm not just trudging through the day and my workouts are a lot more effective too. So if you have an hour, here's my pitch for your book.

When you're at it, go get it. Yeah. Thank you. And it's been fun because we can see on our Amazon reviews, I'm watching women go there and posts like, oh my God, I did the infertility protocol and I was pregnant within 30 days.

So really it's really interesting concept. Now I want to go back to something you said because your specialty, you know, how you got into this was through geriatrics and what I'm seeing and this was really congruent in my own or what I saw my own life is as I went through perimenopause and menopause, the old tricks that I used to keep my weight where I wanted it to be didn't work anymore because I became more insulin resistant.

So talk about estrogens connection and you kind of brought it up like when estrogen goes down, we become more insulin resistant. Why is that? Well, that's a really good question.

And again, a little bit maybe more biochem than what I'm familiar with. But and I think it's important to recognize that estrogen is an insulin sensitizing hormone.

So what that means is that you need less insulin to get the job done. You're more sensitive to what insulin is being produced. And so when you lose that insulin sensitivity, when you become less sensitive to it, you need more of it.

And when you need more of it is when we start to see that hyperinsulinemia and increased levels of body fat. And it's also important to note for women it's not just about body fat.

This is about your bone health, this is about your muscle health and this is about your brain health, also your heart

health.

Why doctors miss insulin resistance and how to test yourself

So estrogen is a very it's not just a sex hormone. It's kind of our power hormone, a powerhouse for women. And and we have to really be mindful that after menopause, you're at an increased risk of all of those things diabetes, heart disease, dementia, osteoporosis, sarcopenia.

And so we talk about obesity a lot because it's often linked with insulin resistance. But I wanted to point out it's not just about obesity, so it's mainly about that insulin sensitizing effect.

Yeah. Yeah. I love the way you phrased that that estrogen is an is an insulin sensitizing hormone. I think that's really important because when you lose estrogen, what what I'm finding is so many women are trying to apply the same lifestyle they did at 35.

They're trying to do the same lifestyle at 45. And they don't realize that they're that they have to do it different because they don't have that that insulin sensitizing hormone.

So they're just the carbs they ate at 35 are now causing them to gain weight at 45. I think the best example is your own cycle. So if you're a younger woman, look at your weight fluctuation during your cycle, you're going to notice that you're probably feeling a little bit thinner, maybe a little bit sexier when your estrogen levels are highest.

And that just kind of proves the point that your weight will probably be at your lowest when the estrogen is the highest because your insulin sensitivity is the greatest.

Now, what happens that week before your period when you might start to get kind of bloated and gain some weight while your estrogen is going down? So your insulin your level of insulin sensitivity fluctuates throughout your cycle.

It fluctuates throughout the nine months that you're pregnant. It's not just at perimenopause and menopause. When we see this, it's every single month in a woman.

Yeah. Yes. Super. Well said. And part of the hormonal conversation that just isn't being had is like how again, how something as critical as insulin resistance ties into all these other sex hormone situations.

Talk a little bit about the brain changes that happen as we go over 40. So this is kind of my new obsession. My next book is going to be on what happens to the female brain after 40.

And one of the things that I that I stumbled upon was a research article that showed that estrogen, when it goes down, estrogen is a precursor for dopamine.

And serotonin. So if you don't have enough dopamine or enough estrogen, you're not going to have enough for dopamine and serotonin, which a compound is this depressive, anxious state that so many women find themselves in.

Do we have any research on what? Insulin resistance? And now I don't I don't have an answer. I only have a question on this. Do we have any research on what insulin resistance does to our neurotransmitter system?

That's really interesting. I've done just a smidge of research. I've been trying there's interesting research. Not like if you're doing a research for central insulin resistance is what I would look up.

If people are interested in this, every single cell in your body has an insulin receptor. And so what's what's fascinating to me is, is that geriatric pity and dementia is we used to think that those were caused from, like, plaques and tangles.

Mm hmm. Well, what we're learning is that your brain cells can also become resistant to insulin, and your brain is

used to using glucose for fuel. So what happens then?

Your your brain cells are not getting the glucose in that it used to. That's why the ketogenic diet, the ketogenic approach that allows ketones to be used for fuel and the majority of your and many areas of the brain.

Some do require glucose, but your body can make it. That's another nother conversation and but that's why people notice such like clearer memory, clearer mental focus.

That's why it's used with people with neurological conditions sometimes and to to give the brain an alternative fuel source that doesn't require insulin because the glucose isn't getting in is officially.

So that's one one reason. And then if the cells don't get energy, then they're going to slowly die. So, yes, that's one way that insulin resistance is definitely being known as a control contributor to dementia one, but the other is vascular dementia.

So there's different types of dementia. There's Alzheimer's dementia, there's vascular dementia, there is Lewy body dementia. And insulin resistance, again, will lead to a reduction in the cells ability to take in and use glucose for energy and your blood vessels, you know, those are made of cells.

And if you're insulin resistant, then your blood vessels will not be as efficient at delivering blood to the cells of your brain. And so that can contribute to vascular dementia when the vascular system of your brain is insulin resistance.

So it's a fascinating topic. I'm excited to to learn more about it. The book, The Brain is really interesting. Did it get you read that one? Yeah, but yeah, I love that stuff.

I love that explanation because what we ate and it reminds me that just so the listener is like fully up to speed on what insulin is. Talk a little bit about what's the purpose of insulin.

When we say insulin resistance, it's kind of become this like phrase that everybody's like, Yeah, I'm insulin resistance in so but what does that mean?

If you are insulin resistant for the cell. Now, it means your cell can't take up energy as well, period. So typically glucose. Yeah, specifically glucose, but it's really an anabolic hormone too.

So it's important for building muscle. But we want the right nutrient substrates, the right resistance training for that. But we speak of it mostly for glucose.

Insulin resistance, estrogen, and fertility

So if you think of the cell membrane kind of like the top of a ball, there's an insulin receptor. And when insulin goes into that receptor, almost like a lock, what happens from inside of the cell?

Something called a glue for transporter, which I think of as a tube slide it goes from inside the cell to the cell membrane so that glucose can move from the bloodstream down that tube site into the cell, into the cell to be used for energy or stored for later use, or the body can repackage it and ship it off to fat cells.

So that's what happens when insulin binds the glue for transport or moves to some membrane. Glucose can come in and that's really what reduces blood sugar.

So that's what we're talking about when we're talking about insulin resistance is it takes more and more insulin to keep your blood sugar shut in. Yeah.

I love the visual of the slide. I was like, That's really good. I would have to use that. You can use it. But so then I want to take it one step further.

So if I can't get glucose into the cell, then where does the body go and store it? Well, I mean, fat is you can't that's the that's the main that's the main thing if you.

But the problem is even fat cells can become insulin resistant. So it's got to go somewhere. But if you have to really think of it in terms of, well, what happens when you when you eat something, it's going to go through your whole digestive tract right through the like, through your intestine, through your liver, your intestines, and then it's going to get stored.

So it's going to end up somewhere. But the problem is just how much how much insulin will be required to store that or use that is the bet? Does that answer the question?

Yeah. Yeah. And then also, where my brain goes is, is that when we look at storage places for glucose, we have actual fat that it will put on your body.

Like this has been a big cry that I have to my reset academy members is like fat is just your body's brilliant way of taking storing something that it doesn't know what to do with.

It just is storing that excess. So when we're looking at the explanation that you just gave glucose because insulin can't get it into the little slice and ends up storing it in fat around your belly, your glutes, your arms, all the places you don't want it.

But what's the other major organ that is fat is the brain. Yeah. So part of what we're seeing with Alzheimer's and dementia is that it stores it in the fat in the brain.

Really interesting. Yeah. Is that the best way to look at it? Because it's going to push it wherever it can put fat. And one of those places is the brain, I don't know, another organ that has that much fat in it outside of the brain.

That I don't know. I honestly don't know. I'd be really interested to look at the fat content of some like of brains with Alzheimer's or vascular dementia.

But I have, I can't speak to that because I don't. Yeah. And then and then it puts it as fat around the liver. But then why my brain goes, well why does fat accumulate around the liver?

And you know, we've heard of fatty and nonalcoholic fatty liver disease as a huge issue from people who eat too high of a sugar diet. So it's just shocking it away.

And all of these different areas which is contributing to poor health as you as you go down down the line of of aging. Yeah. And it's it's it's a little bit more complex because like the level of stress that you have, the level of cortisol that you have, your body might take, you know, 100 grams of sugar.

We'll just call it glucose for now. And it might store more of that in your belly area versus on your hips or your thighs or in your subcutaneous. If you have high levels of cortisol or stress, you're going to be more likely to store that as belly fat, same goes as high levels of insulin.

And another thing that I think is important is a sugar is not a sugar. So if you're having 160 grams will say of glucose compared to 60 grams of fructose, the stick, like only about 20% of the glucose is going to be kind of pushed through the liver.

Otherwise, other cells in your body can use that glucose, every cell in your body you can use the glucose. But for the fructose, nearly 100% is metabolized in the liver.

So when we're talking about nonalcoholic fatty liver disease, that's why added sugar, high fructose corn sirup, really any any form of sugar, because even honey and agave are usually higher in fructose than regular table sugar, which most people don't know that's going to contribute to fatty liver disease if you're having it in excess.

And the book Nature Wants US to Be Fat by Dr. Richard Johnson is the best book that I've read on fructose. If people want to take a deep dove down that and it's really fascinating.

So a sugar is not a sugar. We're kind of speaking like broad terms. But I wanted to point that out. That matters. What you eat, it matters what types of food you're eating.

And do you feel like it matters the combination of food that you put together. So I'm starting to see a lot of glucose hacks. Yeah. Where we've got and I see this in the, in the women that I've been coaching even that you can take somebody who's got a vegetarian diet which you know, I'm from a glucose standpoint, I'm not such a fan of the vegetarian diet because it spikes too much of your glucose.

But if I can get vegetarians to pair their apple with some nut butter or to add extra olive oil onto their salad that might have some legumes, what we're seeing is the insulin spike is not as high.

So talk a little bit about if I am going to have nature's carbs, which I'm a huge fan of for a lot of different reasons, what what happens? Do you believe we should pair it with a fat should we pair it with a protein?

Is do we have any control over minimizing that glucose spike? Yeah, there's a lot of things, so I'll just kind of run through a list of them. I think the, the, the best thing you can do is wear a continuous glucose monitor.

We don't have continuous insulin monitors yet, but if you get a continuous glucose monitor for a couple of weeks, you can do this experimentation in yourself and see what works for you.

So I'm going to start with a top that a starch is not a starch, number one. So if you're having 50 grams of glucose from things like lentils, beans and maybe some sweet potato barley like those darker starches, that is going to be digested slower than 50 grams of glucose from white pasta, white bread, white rice.

Menopause, brain health, and dementia risk

And the reason is because the white stuff is higher in something called Emilio Pectin Starch, which if you look at my hand, there's a lot of branches on the amla pectin, which means the enzymes that chew up those individual molecules of glucose can go really fast.

And so that glucose is then released into the bloodstream fast compared with the darker types of starches, which is AMLO's starch, that's just a straight chain polymer.

So there's two ends for the glucose digesting enzymes to chew up the glucose independent of fiber and fiber content. So food manufacturers are actually trying to now manufacture grains that are higher in amylase content for that reason.

So the first. Thing is to manipulate the food even more like why don't we throw the original weight, the food. Chain, it's like crazy, like we. Had to put a bunch of chemicals in.

So now let me put something good in to make sure that you can be insulin sensitive anyways. Go ahead. That's what I heard in that statement. That's right. So but a sugar is not a sugar.

A starch is not a starch. That's a big, big piece that people want to understand. And the second thing is eat fiber with your meals. So fiber especially from whole food.

So we're not talking Metamucil supplements. We're not talking the low carb bars that are stuffed back with fiber. We're talking about structurally intact fiber from whole food because that will help line the first part of your small intestine to reduce the the absorption rate and the digestion rate of anything else you eat.

It's almost like you're rolling out the red carpet on your small intestine for the other nutrients to kind of slowly walk in fashionably late and way.

You say that. Yeah, that was good. Yeah. So fiber when you say fiber first non-starchy vegetables, salad before your meal, then have some protein and fat.

So if you're having salmon, chicken, beef, eggs, maybe Greek yogurt, whatever your protein of choice is, then if you're going to choose to have starches or sugars, have them at the end of the meal.

Don't be don't be having them in isolation, like you said, some nut butter with an apple or peanut butter bananas. Great. If you're going to choose to have those now, that's another another hack, another one is, of course, apple cider vinegar.

So 1 to 2 tablespoons once or twice a day. I love it. Hot with some lemon juice and hot water. So it's almost like a tea instead of an herbal tea. You can do that in the morning or at night.

It's fantastic. A great way to reduce the morning blood sugar response. And it's really, really, I think. Exposed male. And female and the blood glucose response are one to have it.

When to have it. Before. Yeah. Before you. Yeah. Okay. And how much. Because our body is going to ask how. But I know you know you can do 1 to 2 tablespoons.

It really just depends on your tolerance for it. You can shoot it, you can plug your nose and just shoot it. You can dilute it in water and drink it through a straw if you're worried about the acid for your tooth enamel.

And I love using that for my exceptional size, but they're called I Don't Eat Perfect 100% of the time. We go out to dinner. When I go out, I still try to make healthy choices.

But if I'm going to have more carbohydrates, I'm probably going to have some apple cider, apple cider vinegar before that meal. And again, do your own testing, get a continuous glucose monitor, have some ice cream or whatever.

I'm not going to I'm not listening. To organic ice cream. Yeah, I eat ice cream. I am dessert. But I do know. But the hacks that you're talking about.

So go ahead. So I guess it's organic or chemical free ice cream. Yes. So so how come that and then the next next time you have it, have some apple cider vinegar beforehand.

There's this guy, an insulin resistant underscore one. His name is just just Justin Richard, maybe. And that's all his Instagram account is is him with a CGM and he does 16 hours of fasting a day and then he eats for eight and he'll eat some pizza.

Then I'll check his glucose and then the next day he'll have a salad, and then he'll eat the pizza and they'll compare the glucose. And the next thing I'll do apple cider vinegar and then the pizza and compare.

So that's a great account if you don't want to get your own one to just see like what does it do on someone else you can. Yeah. So those are some interesting little hacks.

And another one of my favorite is walking after a meal. So ten minute walk after you eat is great. We did one of our exceptional meals on Friday. Ironically, my husband's a farmer, so he got done planting.

We went out for a family dinner and we went off to our favorite ice cream place in downtown Omaha, came back, went for a family walk. It felt so good to not just come home and let all of that sit and reason like the reason that's so important going back to that tube slide that goes to the cell membrane, the only way that glucose can get into your cell is from insulin or like the glue for transport or muscle demand.

So if you're exercising, if you're walking, you can get that glue for transporter two, the cell membrane independent of insulin. So that's one of the reasons that it's important.

Now that dovetails into this next recommendation, which is my personal favorite, which is if you're going to have carbohydrates, have them within 30 minutes of exercise, again, the exercise will get those glue for transporter two, the cell membrane, so that the glucose can get into your muscle cells to be used because you're using that energy during exercise.

Well, those glue for transporters stay there for 30 to 40 minutes after you're done exercising. And so you can eat some more carbohydrates and they'll kind of just get soaked into your muscle cells to replenish muscle glycogen stores so that you can use them the next time that you want to exercise.

That's one of the big kind of misconceptions about fasting, I think, is that you have to like go through all of your muscle glycogen before your body will start to burn body fat.

And that's not true. Your body staves that muscle glycogen for exercise to fight or flee stressful circumstances. And I kind of happened on that one because I love high intensity interval training and I was wiped like when I was a fully like low carb lifestyle, which I still do, but I do now incorporate some more carbohydrates if I know that I want to do high intensity or interval and or I'll just go longer periods of time between those training, those types of training sessions.

So I've learned a lot about nutrients with exercise and what types of nutrients like are used for which types of exercise. And that's helped me a lot.

And then another great little carpark is have your carbs within 30 minutes of exercising. Yeah, those are some of the top ones on my mind. Yeah. You know, I just want to point out that watching the trajectory that that we've made as a society in this conversation, I feel like ten years, 15 years ago, the conversation was just starting to be had that, hey, certain foods are going to make you more insulin resistance.

So if this is a new part of the conversation to you, welcome.

How insulin works and where excess glucose goes

You know, we've been having this conversation health world for 15 years. Quality of food really matters. So go back to nature's food. Get out of the manmade foods, because typically that's where insulin resistance is.

You're heading more to an instant resistant state. When man has manipulated food. Now, what you just said was gold. And I would even encourage people to go back and relisten to that, because what I'm seeing now is that we're changing the conversation and asking, okay, well, I want to be insulin sensitive, but I don't want to be in deprivation.

So what can I do? And this is where apple cider vinegar walking, you know, where you place your carbs within your meal. All of that is the new version of this conversation that is so important because health should be fun.

It should feel easy. It does. You don't have to be deprived to be healthy. Do you do. You feel like that's what you're seeing as well in this conversation of insulin resistance?

I think so, yeah. And I'm kind of with you that I think it's going to progress into more disease conversations. I think there's going to be more evidence like nonalcoholic fatty liver disease is an excellent example.

But I think we're going to start to see that types of that type of conversation around Alzheimer's and other forms of dementia. So that's my opinion as I do believe that brain health is going to become central, especially as our baby boomers age and we're going to see higher incidences of dementia.

And people are going to like, Oh, what's happening? Or like we told you what's happening, it's insulin resistance, it's an unhealthy lifestyle. And it's it's important to recognize these are lifestyle diseases and they are fixed with lifestyle.

They're not medications. They're fixed. Yeah. So where tell me where you think muscle comes in to insulin resistance because one of the plates that the menopausal woman has is that as after 40 hour ovaries aren't making sex hormones as much anymore and so our adrenals are working triple time.

And my experience in my own body and watching a lot of women go through this is that the adrenals will start to break down muscle to get the nutrients they need to be able to make sex hormones.

And it gets harder and harder and harder to build muscle. But shoot muscle plays a part in insulin resistance. I'm already losing estrogen now I'm losing muscle like, give me a frickin break.

Like, where do I get to? To the door in. So talk about what what I've done is really my workouts are muscle centric. I am massively focused on building muscle at 53, a lot more than I was at 43.

So share with the group like where does muscle and the amount of muscle specifically in a female body, how does that relate to keeping us insulin sensitive?

Yeah, so I think there's a couple of things in my mind. The first is the space in which we have to deposit glucose after a meal that is not fat tissue.

So if you think about, let's say a tennis ball and a volleyball, let's use those analogies. So someone with low muscle mass might have the muscle of a tennis ball.

That's not very much room to to put the glucose after a meal muscle is a really important place for glucose goes after a meal that's not a fat tissue.

And the bigger the more muscle mass you have. It's almost like a garage. A garage. You can put more cars in a bigger garage. If you have a one car garage, you got a one glucose garage, you're going to have a lot of stuff, a lot of glucose being stored in fat tissue around your liver, around your organs, not where you want it.

So if you have more muscle mass, maybe you have like a volleyball sized muscle mass in your body. Well, guess what you get to? You get to tolerate a higher amount of carbohydrates without them being diverted into your fat stores right away because you have more muscle.

Now, the second piece of the conversation is look at the surface area. So if the surface area of the tennis ball, you can you can fit more insulin receptors around a larger surface area.

So you're going to maybe have ten insulin receptors around a tennis ball and a hundred around a volleyball. The more insulin receptors you have, the more insulin sensitive you are.

So glucose is more efficiently stored and we again are elevating our insulin and creating that hyperinsulinemia situation. So it's about how much space do we have to store glucose and how many insulin receptors do we have to create that insulin sensitive environment?

So those are a couple of things, but when we're talking about muscle, I think it's really important. Resistance, training, protein, anabolic resistance is not talked about enough and anabolic resistance is the resistant nature that we can develop as we age to building muscle so that can happen.

Obesity. Think of think of these as risk factors obesity, physical inactivity, kidney failure, low protein intake, and they stack on top of each other.

So a lot of people are talking about 30 grams of protein per meal. Fantastic. I'm all about it.

Food order, glucose hacks, and meal timing strategies

We need like that that leucine threshold that we talk about a lot, three grams of leucine is found in about 30 grams

of complete protein. But if you have antibiotic resistance, that that amount goes up to closer to 40.

And so that's really what we talk about from an aging adult standpoint from a postmenopausal women. Yeah. If you're getting eight grams right now in your oatmeal in special K like going to 30 grams a meal is a big jump.

But ideally we want you closer to 40 so that you can build muscle because anabolic resistance is probably a you might be experiencing some of that if you set interior obese or have some kidney dysfunction.

So the reason I love that, because the research that I've seen is it's somewhere between 30 to 90 grams that will trigger that amino acid receptor site, building the muscle stronger, creating more openings for insulin to drive glucose in.

After 90 grams, it turns more to glucose and now it's going to be more it's like a detriment to you. So now whenever I quote the study, people always say, well, what about if I'm a hundred, you know, a £200 male?

Is that the same as a £130 woman? And I don't have the answer to that, but I will say that the amount of protein really, really matters for building muscle.

And I also want to point out that I don't think this is talked about enough that you don't just have to do resistance training to build muscle. You got to eat protein to build muscle.

And would you agree on that. 100%? And the reason is because your body doesn't have a way to store extra amino acids. So if you think about what happens when we eat extra glucose, well, it's stored as fat.

What happens when we eat extra protein? It's converted to glucose and then stored as fat. So your body like your muscles and stuff that yeah, there's amino acids in your muscles, but your muscles are not a storage form of amino acids.

Your body's not going to break down your muscle tissue so that it can use the amino acids to build more like that's totally counterproductive. So what people have to understand is you need doses of protein.

You don't build muscle without doses of protein and you can't get to store it. It's almost like sleep, you know, like you can't you can't store your sleep.

You use it for it day to day that we are going to buy that. Yeah, you can't. Your body fat is just fat. It's just energy. It's glucose. There's not protein stored in your body fat.

So we have to get it from our diet. Yeah. So well said. And I think that we don't give again, we don't give protein and muscle enough credit. So and what I'm seen in a lot of menopausal women is that they're really struggling with muscle and then that plays out to your overall.

Health as you age and then. Many levels. So I think that's amazing. But let's talk a little bit about the monitors are out there. So I'm I'm like you.

I'm a huge fan of the glucose monitor, but it's not always it's not always financially approachable for people. So are there signs and symptoms we could see, you know, talk about a glucose monitor.

What's the difference between pricking your finger and, using a glucose monitor? And if you don't have the financial resources to measure, is there another way for us to know if we're moving towards insulin resistance or?

If a meal worked for us, that didn't work for us? That's a good question. So first of all, that I like the ketone motor device and that's a finger prick device.

And that also measures ketones. I find that very motivating to do like towards the end of a longer fast to see where where my ketones, where's my glucose level and that's only a point in time though.

So you got to be kind of careful because a lot of people will get really obsessive over the numbers and like your glucose is going to be higher in the morning because you have a morning cortisol response.

Check it at 11 a.m. It'll probably be lower. You get to see that data with a continuous glucose monitor, but it is a little bit more of a financial investment for people.

So if you're thinking about just general rule of thumb, how did my body respond to that meal? How was that load of carbohydrates? The first thing I think about is energy levels.

If you're eating a meal and you're like, I got to go take a nap, I am so tired. Your body is just overloaded, overloaded with blood sugar, overloaded with insulin.

That's one of the first things is just that fatigue after a meal, fatigue throughout the day. Another one is frequent hunger. So if you're having a frequent hunger or frequent carbohydrate or sugar cravings, that's one of the reason that's one of the signs of insulin resistance, because, again, the glucose isn't getting into your cells.

So even though your body has plenty of energy, it's not getting into the cells. And that best example of that as a type one diabetic, so they are hungry all the time, they're thirsty all the time, and they can't gain weight because.

They don't make insulin, but they're hungry, their cells are starving. There's plenty of energy, but it can't get into the cells. Yeah. And so that's if you're insulin resistant, you're going to, you obviously you'll still have high blood sugar levels that you're not.

You're but you're also going to have high insulin levels because you're not type one diabetic. But the point is the cell is starving. The cell wants energy and it wants entertainment.

Which is crazy because it's starving, but you're eating, eating, eating, and your cells aren't getting what they need. So it tells you to eat more and eat more and eat more.

I mean, this is the interesting part about dopamine. When you look at why we eat certain sugary foods is we're going for that dopamine response. Yeah, but the research has shown that people who are more obese have less access to these dopamine receptor sites, so they have to eat more and more of the chocolate cake to get more and more of the dopamine response.

And it's it all comes back to that cell. It's like it's crazy when you go and you think about that.

Muscle, protein, and staying insulin sensitive after 40

I'm let's finish up on this conversation. If you had a 55 year old woman that was had just gone through menopause, had gained a bunch of belly weight, was losing some memory, still had hot flashes and has a hemoglobin a1c of like 5.8.

What would what would you what are her? The top three things she can do immediately to start to move her her insulin sensitivity in the right direction.

Fabulous question. Aside from bringing in mindset, which is a different conversation altogether, right? Skip over that. That's another podcast or interview.

Another type of mindset is you having that right mindset is huge. So at the top we have something clutter is overly habit hierarchy, and the first two things are related to mindset.

Right after that is water. Drink half of your body weight announces a water a day every day, or at least until your urine is clear or very light yellow.

We're not talking Diet Coke. We're not talking, you know, coffee and tea count up to about like 400 milligrams of

caffeine, which we really recommend reducing anyways, she's dealing with hot flashes and she's probably having some sleep issues.

And so I think if she can really reduce that caffeine intake up the water intake, number one, that will help with satiety between meals, it will help with weight loss.

The second thing is to focus on protein again, getting 30 to 40 grams of protein per meal. And we have an ultimate food guide. There's all sorts of resources out there on how do we increase our protein intake.

And then the third thing that I would say, I think next might be like added sugars because I think fasting is so powerful. But if you're trying to do what I consider more moderate fasting without first dialing in your water, in your sleep, so sleep is the next one.

It's hard. It's going to be harder because your satiety is not going to be long. So I'm going to give them a bonus. I would say sleep 7 to 8 hours a night.

We're going to really dial in the sleep because that makes everything else easier to implement if you're well-rested and for that, you can wear amber colored blue light blockers, I like to say like 2 hours before bed again, reducing that caffeine, there's certain adaptogens or supplements that may help on screen time.

What are your screen habits before bed? What are you doing to wind down before bed? All important things. And then the last is to fast for 12 to 14 hours a day.

So she's used to like snacking after dinner. I would say stop that. That's like one habit right away to stop her 2 to 3 solid meals a day, eliminate snacking, especially after dinner.

And that's where I like people to start. Like we want you to build the foundation. We're not doing crash diets. We're not getting like a two week meal plan because it's a lifestyle change, water mindset, different conversation mindset, which is kind of like stress management, water, sleep, intermittent fasting.

Start with soup, you know, 12 to 14 hours. Everyone can do that. You can work around your medications. It will help with your sleep if you're not eating right before bed.

Those would be the top three things that I would say. Oh, I think that was brilliant because, you know, part of my passion is how do we make this simple?

And what happened is the health care system, our conventional health care system made things very, very complicated. And then all of a sudden, those of us that are trying to teach lifestyle medicine, we started off with simplicity.

But man, now it's gotten very, very complicated. And I am like trying to bring people back to the report so that was brilliant. That was such a good explanation.

And they're like things you're adding in. Yes, you're exactly. You're not depriving. You didn't say take your soda away. Didn't say take your sugar away.

You were like, drink more water, prioritize sleep, eat some more protein. And yeah, really, really. Cool because I think that's important.

Signs of insulin resistance and first steps for a 55-year-old

The order of implementation is important because if you're just trying to cut sugar without having adequate hydration and protein, your sugar cravings or me out of, you know, off the charts.

Yeah. So and if you're sleep deprived, so if you can implement in certain a certain order to make, it's almost like

dominos. One domino falls and makes the next one easier and easier and easier.

Well, by the time we get to the top, you're really implementing those higher level habits so much easier and more consistently. Yeah. So that's what I wrote.

Oh, my. Brilliant. Now, okay, Morgan, do people find you? I love you know, what I always think of with you is I think it's like you have such a sensible approach to insulin management.

Like when I hear you speak, I'm like, That's clear. And you give us great steps, you've got great resources. So, you know, you're you and me are both out there trying to get the world metabolically healthy because we know the impact it has on everything else.

So I want our listeners to find you. So where where can they find your information? Yeah, a few places. Our website is Zivli.com, Z I V L I.com. I'm on Instagram @zivli and then we have a YouTube channel, Dr.

Morgan Nolte Zivli. And then our podcast is Reshape Your Health with Dr. Morgan Nolte and all those are great places. I would recommend people start with our ultimate food guide that they can grab on our website.

It's free and it has over 80, 80 foods that help keep insulin. Mon perfect. Well, I appreciate this conversation. I appreciate all the education you're giving.

And I always say we're more powerful together when we're having conversations like this. You know, the way you phrase things makes me think about it. Different people who have maybe heard this concept before the language used like the slide for the glucose.

That was brilliant. It just gives more context to this. The art of staying insulin sensitive, which now has really become an art. So just grateful to thank you.

I'm so grateful for you and all the wonderful work that you're putting out there too. So thanks. Thank you.