



Diet Doctor Podcast

with Kirsty Woods

Episode 68

Dr. Bret Scher: Welcome back to the Diet Doctor podcast I'm your host Dr. Bret Scher. Today I'm joined by Kirsty Woods. Now, Kirsty Woods is an exercise physiologist and founding practitioner metabolic health solutions in Western Australia. And this this interview fits in very well with sort of this little two interview series I guess you can say about practical testing.

So we have practical testing about measuring ketones and now we're going to have practical testing about measuring your metabolism and your body composition. And she is a specialist, an expert in indirect calorimetry and using this test to help target solutions for obesity, PCOS, fatty liver, all sorts of metabolic health diseases, and also using body composition tests.

So that's what this interview is all about. Basically what is indirect calorimetry, what is resting metabolic rate, what are we looking for when we test them, what are we looking for when we test body composition. And more importantly how can you use these to help inform your lifestyle choices, to learn what are the right choices for you.

Because in determining what are the right choices it's all about what is healthy weight loss. Anything, any intervention could lose weight potentially, but you want to make sure you're losing weight in the healthiest manner and that's what these tests do. And that's what we're going to hear from Kristy.

All the basics and some of the more detailed nuances of what you need to know about these tests. So I hope you enjoy this interview with Kirsty Woods and I hope you come away with lots of practical information that you can implement today to help you on your path to better metabolic health. Kirsty Woods thanks so much for joining me on the DietDoctor podcast today.

Kirsty Woods: Thank you for having me. I look forward to discussing all things metabolism and metabolic health.

Bret: Absolutely. Yes. And you know, we've been sort of joking that I have this mental block on pronouncing the word "indirect calorimetry".

Kirsty: Well done.

Bret: So I'm going to attempt to get it-- Thank you. I'm going to attempt to get it right throughout this podcast, but let's just start there. What is indirect calorimetry and why should we know about it?

Kirsty: So essentially, it's the fancy word, which I also had trouble with when I first started as well,

to test metabolism. So it's essentially the gold standard that we have at the moment. And it's sort of a breath test looking at oxygen and carbon dioxide so we can see what's going on at a cellular level.

Bret: So I got them and it's pretty cool physiology. Just by measuring the oxygen that comes in and the carbon dioxide that comes out, it can tell you what you're burning in your body for fuel, whether you're burning glucose or carbohydrates, which on the one hand, seems sort of like bizarre. How can it do that just from oxygen and carbon dioxide? But I mean, it's that simple and that complex all at the same time, isn't it?

Kirsty: Yeah, exactly. So a little bit of taking a step back of how it does that is we know that when we burn, for example, carbohydrate, the ratio of oxygen and carbon dioxide is about one. So one-to-one. When you remember, back to chemistry days, when you have oxygen combined with food in the cell, it gives off your carbon dioxide energy and your waste products like water as well.

So it's that equation. So they're both balanced when you're burning carbohydrate. When you're burning fat, you use more oxygen and you give off less CO₂. So it's a more efficient fuel. It's the way the body is designed. And so the ratio of those two gases is 0.7. So that's how you're able to get an indicator of what fuels your body's using, because generally at rest, unless you're in a critical sickness state, you're not using protein.

Bret: So basically, if you're at 1.0, you're burning almost exclusively carbohydrate. And if you're at 0.7, you're burning almost exclusively fat.

Kirsty: Yeah. Correct.

Bret: Is that an accurate statement? Okay. Now to do this, is this the test that you-- so you do this test all the time in your clinic with thousands of patients? So you have them sort of lie down, how long does it take, give us an idea of like what's involved in getting the measurement on your patients?

Kirsty: So in our clinic, which is a little bit different to research, which is essentially how I got involved with all of this, is research, you need a, for example, rest for a long time before your test. It takes a long time. You need to calibrate it. Which has its challenges to bring it to clinic because the patients run their busy lives and those sorts of things.

So essentially, what I've helped do at Metabolic Health Solutions is develop a protocol and a machine that's portable, a device called ECAL that is applicable in that clinical sort of setting. So we have patients fast for four hours, which is hypothetically after that the end of the meal cycle or insulin should be cleared. So we can get valuable data that we can retest over time at the similar sort of time. So we can see that change.

They're in a semi inclined position. There's some videos and pictures on our website - if anyone that does want to see - with a nose peg on and a mouthpiece in for about five to 10 minutes to get a good data set as an indicator of what's happening at that point in time with their metabolism.

So that we can direct dietary interventions, validate any interventions and help educate the patient about why they may be having difficulty losing weight or struggling with their chronic disease, even though they're normal weight; might have high blood pressure and those sorts of things.

Bret: So you already mentioned one result that you can get; the respiratory quotient, which gives you an idea of what fuel they're burning. But you can also get a resting metabolic rate, a basal

metabolic rate. So tell us what that is what we need to know about the difference between resting metabolic rate, basal metabolic rate. Because a lot of people use them interchangeably. Is that okay to use them interchangeably? Tell us a little bit about that result as well.

Kirsty: Yeah. So in terms of the gases I talked about before, you can have a look at oxygen utilization to see how much someone's burning. Now, as you say, there's a couple of different things that people use. Basal metabolic rate is how much energy we require to essentially stay alive. It is quite difficult to get particularly in a non-research setting.

But we find because we have patients follow a strict pretest instruction protocol, including the no eating, no exercise for 12 hours, taking medications as per normal, we can have a look at their resting metabolic rate, which is how much they would burn if they were just sitting around all day with some normative data that is repeatable over time, because of those pretests instructions so that we can utilize it as the formation of management.

Bret: Yeah. And that's an important concept about the-- everything has to be the same beforehand. Because if you measure it after a real hard work out or right after meal, it's going to be pretty different than if you did after resting for 12 hours or not eating for four hours. So I think that's an important part that people can take home right away. If you're going to get tests like this done, which we're going to get into why you would or wouldn't.

But if you're going to get something like this done, you need to be consistent about your pattern and your protocol before getting it done. So that makes a lot of sense. Now when we measure metabolic rates, you know, there's this concept that we don't want to lower our metabolic rate.

And I think that's sort of commonly talked about, which kind of goes back to this study that Kevin Hall did about The Biggest Loser contestants were, you know, six years after completing this Biggest Loser competition where they lose like a hundred pounds doing intense dieting and intense exercise, that they gain the majority of the weight back, but their metabolic rate decreases so much.

I think it continued to decrease even six years after they were done despite regaining the weight. And that's sort of the poster child for unhealthy weight loss, because the metabolic rate went down. So tell us about that. Like why, why does that happen? Why do we want to avoid a decreased metabolic rate like that?

Kirsty: Yeah. So obviously in terms of that study, when we think about it, is metabolic rate is generally related to surface area. So naturally when someone does lose weight, their metabolic rate can come down. But it should be not too much, whether in those participants it was dramatic. And even when they regained all that weight and that surface area, as you mentioned, it didn't go back up.

So what that means is they had to eat even less before and they were still gaining weight because of the such the dramatic keto approach. So calorie restriction and all that exercise. So what's happening there is a bit of a starvation response. Because the body could have even been burning glucose, we don't know that.

That's not available, but essentially, is the body thinks that it's not going to get its next meal. So this is from the gene that we have from our ancestors. So what the body does is says, well, I'm going to actually slow my metabolic rate so that I can survive longer. However, in today's society, we always get that next meal.

So if you have those genes, but the adaptations may not be applicable. Hence makes weight loss difficult like in the study in *The Biggest Loser* and why they don't have the reunion show. So that's, once again, why metabolic rate is important, but also we need to have a look at other factors such as their fuel utilization. Are they burning glucose or are they burning fat?

Because particularly we find in those that are burning glucose as opposed to fat is where those detrimental metabolic decline occurs, because their body goes into that starvation mode. Whether if someone's burning fat is they don't get those starvation signals, because essentially what's happening is they are getting fuel, but it's from their internal fat.

So that they're not - the alarm bells aren't going off. So they're essentially getting their meal from inside their body as opposed to externally.

Bret: Yeah. So that, that's really interesting. So a couple important there. So the first thing I want to go back to is, as you said, the metabolic rate is related to surface area. So any weight loss, any weight loss reducing surface area is going to reduce metabolic rate, which I think is important because it's not black and white.

It's not like any weight loss that has a reduction in metabolic rate is unhealthy, right? So I think that's a very important point you made. So one question is, where is the cutoff? How do we determine what is healthy and what is not healthy in terms of the reduction in metabolic rate?

And it sounds like you're saying fuel utilization is one way to make that determination. So I thought that's really interesting. So I mean, can you be so bold to say, as long as you're burning fat, then you're not going to have an unhealthy reduction in metabolic rate, period, or can you still have that?

Kirsty: So essentially, for most cases, I'd be quite confident in saying that, but we need to think about other factors. So for example, if someone is losing weight and their metabolic rates declining, and they're hungry and they're losing muscle, which is another thing we look at in the clinic, that's a clear indication there might not be getting enough protein and that are going into that starvation mode.

However, if those things aren't occurring then and they're feeling good, they're maintaining their muscle, it might just be that essentially they're less... the metabolism's less stressed. So similar to an inefficient car, which burns through a lot of fuel, having a higher metabolism might not be good and might contribute to aging.

So sometimes you see a natural decline, which is actually positive, because our cells become more efficient. They don't need as much fuel. And they've done some studies in athletes where they actually have a lower than expected metabolic rate, because they are so efficient.

Bret: It can really confuse the interpretation if you're thinking of metabolic rate going down as a bad thing. But if it's because of a-- you have to determine if it's because of efficiency or because of this adaptive thermogenesis or the starvation mode as it's called that happens with like *The Biggest Loser* contestants.

So that's why you need someone like you, who's got experience and knows the details and the nuances about this. So, what else can you get from this indirect calorimetry test? You get the basal metabolic rate, you get the respiratory quotient, is that the majority? Are there other things that you get from the test?

Kirsty: Just as we touched upon, we get an indicator for mitochondrial function. So we have a look at efficiency. So from the 21% of oxygen in the atmosphere, we can see what percent people breathe out as an indicator for what's being utilized at a cellular level. But unfortunately, engineers aren't too happy with how efficient we are as humans. We tend to breathe out majority of oxygen. So essentially, normal was about 16 to 17.

And the lower that number, the better. 16 to 17% is what we breathe out. The lower that number, the better. We've seen about as low as 14 in elite athletes. The higher that number means that there's likely some cellular stress going on. And this has a big impact in things like fatigue, maybe the role of supplements, obviously exercise, sleep apnea, vitamin D and those sorts of things as well.

Bret: Yeah. So give us an idea in your clinic, how you use this testing. When people come in, they get a baseline measurement, they want to lose weight. They're maybe struggling to lose weight. What kind of interventions can you do? And then when would you follow up with another test? And what do you look for to see if things are improving?

Kirsty: In terms of when they present initially, we generally-- in my clinic, I see people with weight issues and chronic disease. However, we've got people using the ECAL device for the likes of the English Institute of Sport, dieticians, endocrinologists. So they may use it a little bit differently because at the end of the day, it's a tool.

However, how I use that data is number one, see what's going on for the patient. For example, if they're having difficulty losing weight. Are they burning fat? And majority of patients are not. So number one is I've helped educate them to say there is something going on and the good news is that it's not stuck in stone. So we can actually see metabolic changes within about three to five days.

So we generally get a follow-up about one to two weeks to see whether our directed intervention has the desired impact. And if not, we have a look at other lifestyle factors, pathology and it prompts us to ask further questions. So in terms of the intervention is diet generally has its best bang for its buck, which is also where low carbohydrate strategies come into it.

After a bit of stumbling around, I could see that the direct impact that reducing carbohydrate load through the hormone insulin could have on fat utilization. And then obviously exercise and some simple supplementation strategies, particularly if, for example, they're on a statin under their GP's care, they might have poor efficiency in that, where maybe where something like a Co-enzyme Q10 might help with that. And obviously, exercise strategies to maintain muscle, make sure that they continue to burn fat and things like that.

Bret: Yeah. So that's really interesting. Now we to obviously talk a lot about low-carb nutrition on this podcast, and there's no question that low-carb nutrition can help reduce that respiratory quotient down to 0.7, help with weight loss that doesn't reduce the metabolic rate as much. But can the same be said for some low-fat diets?

I mean, can low-fat, high-carb diets still help people reduce weight without a dramatic reduction in their metabolic rate, as long as they're not going sort of overboard, so to speak, like they did in The Biggest Loser studies?

Kirsty: Yes. So where that may be appropriate is some of our patients are what we call metabolically flexible. So they still have that ability to burn fat at rest. So, you know, after their food's

digested, they get back to burning fat. So that's where some of those strategies may be appropriate almost. So they might be able to get away with it.

And that's where energy intake, fasting sort of strategies, they may have, still have a more an impact as opposed to those who are metabolically inflexible and can't burn fat. You need to get them burning fat first. Because essentially, at the end of the day, when we talk about weight loss, we really mean fat loss. So if you can't access it, you're going to have some of those detrimental effects.

Bret: Yeah, that's a great point. I mean, we talk about weight loss as if it's one thing, as if it's all the same, but it's clearly not. It really is fat loss that we want with maintaining or building lean muscle mass in the process. So that makes a lot of sense. And I like how you mentioned about the people who are metabolically flexible. So, you know, there's this big debate constantly going on, it seems, about the US dietary guidelines.

And one of the latest things now is it's designed for healthy people. It's not designed for metabolically sick people. But when we look at our... at least our American population, the overwhelmingly majority are metabolically unhealthy.

So that dietary guidelines wouldn't apply to them and the metabolic flexibility that you're talking about probably doesn't apply to them as well. Now, is that, is that something you can test and measure with your indirect calorimetry, saying, are they metabolically flexible? Like, do they... you know, I'm just hypothesizing here.

If they came in after a meal, maybe their respiratory quotient is 0.9, but if they came in after a four-or-five-hour fast, the respiratory question would be 0.8 to 0.7. Like, can you see that type of variation just on the protocol?

Kirsty: So as I said, we generally have it so it's consistent over time. But for example is I might have a patient who's been doing really well, able to burn fat, and they might have a birthday, for example, when I see them the next day, I can see it, it flipped back. So it's an indicator for they're not still, not metabolically flexible long-term.

I'm not as confident in saying that that made that direct impact. It's more so what's happening at that point in time. But what we do see is that patients, for example, we've seen patients over the long-term is they might come in presenting not burning fat, they're able to get fat burning and the more weight they lose, the more insulin-sensitive they become.

We can use their data to essentially titrate their carbohydrate loading, and they can get, essentially get away with a bit more, which is, once again, the premise of no one-size-fits-all. Everyone has those different degrees of metabolic flexibility and depending on what their goals are as well. So essentially using that data to end the diet wars that you're talking about before. Is, is this person meant to be low-carb or low-fat and things like that?

Well, actually there's no hard and fast rules. Let's use the individualized data because it can very empowering for the individual, but also as a practitioner, good to validate whatever you're doing.

Bret: Yeah. I mean, great point. We're really are sort of getting into this new world, I guess you could call it. Shouldn't be that new, but it seems like it is. This new world of personalized nutritional intervention rather than just trying to give one diet for everybody to follow but coming up with different ways to test what is the best diet for you.

And just the number on the scale is probably not the best measurement for that, but something like what you're doing with a respiratory quotient, the resting metabolic rate, gives you so much more information. And not just about the food we eat, but when we eat and how much we eat.

So when it comes to chronic caloric restriction, that is sort of a recipe for risking a decreased resting metabolic rate, especially if you're not burning fat. So one of the other new kid on the block, which isn't so new, is intermittent fasting. And there's, there's obviously this debate. When are you fasting too much so that you're mimicking chronic caloric restriction?

So it sounds like your tool here, this indirect calorimetry, would be a wonderful test to say, are you fasting too much? Are you decreasing your resting metabolic rate too much? So is that some another way that you can use it clinically?

Kirsty: Absolutely. So a bit of a story to share. When I first started is obviously we, you know, we looked at... you got to eat frequently and those sorts of things. And then obviously some of the stuff about fasting started coming to fruition. So a lot-- well, obviously, let's, once again, research to practice. Let's put it in place and test and not guess what's going to happen.

So generally patients might be in a 16/8. We've had people up to 24 hours, 48 hours unsupervised. But anything beyond that, they supervised with their GP, but I've had patients with all of those and it's really motivating for them to see that it might not reduce their metabolic rate.

So as a way of overcoming some of the barriers, which is what I generally use it for in clinic, but also to dictate, as I said, are they doing too much? Do they need that resistance-based training to negate some of those side effects and those other factors as well?

Bret: Yeah. So you mentioned resistant-based training. And one of the concerns about most certainly intermittent fasting, but any weight loss could be, if you're also losing lean muscle mass. Now, if you're losing total body weight, you may not need as much lean muscle mass to sort of carry the weight around, but still the concept holds that you want the highest percentage of lean muscle mass that you can have.

It's more metabolically active. It's better structurally and long-term to prevent sarcopenia and frailty and so there so forth. So what other testing do you do in clinic to help determine are you losing mostly fat? Are you maintaining or building lean muscle mass? What other parameters do you follow?

Kirsty: Obviously, we do do weight, but once again, is we know that that cannot be relied on alone. So we also look at indicators for where they're storing their weight. So having a look at your typical waist measurement. And when we introduced a few years back based on the risk factor for sleep apnea and the likes of those sorts of things is actually their neck measurement as well.

So I know you might've seen some recent research papers that show that fat can actually be stored in the tongue, which is why it can contribute to those sorts of things. So it's an indicator for that. We have a look at body composition through bioelectrical impedance in the clinic, which essentially sends a harmless current which travels quickly through muscle and slowly through fat.

So once again, we can get an indicator of how those tissues are changing over time. Cause we're testing them under the same pretest instructions at about six weekly intervals.

Bret: So bioelectrical impedance has-- my guess is it's become the most common way to measure body composition. Because now anybody can sort of get a scale on Amazon that does bio-

electrical impedance. But it's got some downsides, right?

I mean, it's very sensitive to hydration status. It can be inconsistent. So what are some of the tips you have for people who want to follow their body composition with bioimpedance scales? What would you tell them they have to do to get the most accurate measurements?

Kirsty: Not to get just scales. And the reason I say that, how it works is by sending that harmless current. So when you've got your scales, it's essentially sending that current from foot to foot. So only has a look at lower body. And because you're standing and one of the biggest issues, as you say, is the impact of fluid, is fluid can go from right your head to your toe.

So that's going to have more fluctuations than if you get a device at seated or whole body or lying down as well. So that's number one is try and get a whole body measurement. Number two, similar sorts of times of day under pretest instructions.

So for example, even something like eating, when you eat, you've got to digest that food so it can transfer the blood flow to your stomach and those sorts of things. There's a lot of different things which impact it. Showers, they vasodilate the blood vessels, making them bigger, so that can impact the results as well.

So generally, the devices will come with the set of instructions, but there are a couple of things that maybe people don't do. And I know that here in Australia, when people go to the gym, they're not told about pretest instructions and I wouldn't use those results for any clinically informed decision.

Bret: Yeah. I see it all the time at the gym there, they have a bioimpedance scale. One that you grab the handles and stand on the scale. But people just walk up and do it at any random time. Before their workout, after the workout, during the workout, after drinking. And if you're not being consistent with it, you're going to get a pretty wide variation in your results, aren't you?

Kirsty: Absolutely. And the other thing I might just say is it's not something that you do every day because what we're looking for is change over time. So as I said, at least four weeks, if not six to eight, to see a significant change in those, some of those sort of parameters.

Bret: All right. So now just a, I guess, a quick review about what the bioimpedance scale even tells us. I mean, it tells us lean muscle mass and body fat percentage. So those are sort of the big two take-homes. So is that, is this sort of your big two take homes when you look at those results too or there others?

Kirsty: That would be the main ones I'd be confident in using in clinic. So essentially their fat mass and also then their muscle mass. And as I said, make sure that they're losing weight from fat, not muscle. So for females, as I said, you'd particularly expect some muscle loss with a significant weight loss. So around two thirds you want from fat as opposed to muscle. The ones that I suppose might be good as indicators might be something like some of them do, the bone mineral density.

But once again, DEXA is the gold standard for that. And some of the other ones say that they've got-- like the ones at the gym say that there's the visceral obesity is this, I wouldn't be as confident in those sorts of markers.

Bret: Yeah. So you mentioned a couple of things there. The visceral obesity, the visceral fat, meaning the fat sort of internally around your organs that's associated with increased risk of met-

abolic disorders and mortality even, you really do need a test like a DEXA scan, or the best ones are CT, MRI, but those are very expensive and involved.

Yeah. So the DEXA scan though is also become pretty popular for body composition, because now there are sort of standalone companies that do this, that have the DEXA scan. It's quick, it's radiation, but relatively low dose. How do you find that compares to the bioimpedance scales in terms of the accuracy, reproducibility and the results?

Kirsty: Just before I go into that, I forgot to mention is on some of the other devices we were talking about, you might also get a readout for metabolic rate. However, that is not your metabolism. What that's looking at is based on your age, height, and gender and an equation I'm looking at, for example, your muscle mass.

It plugs those number away and gives users essentially an equation to look at what your metabolic rate is, which can be inaccurate, particularly in the populations we're looking at. So if you're overfeeding or underfeeding, based upon those, it also doesn't have a look at that fat utilization.

Bret: We'll get back to the DEXA question in a second, because in terms of that, this one always drives me crazy. I want to get your opinion on it. The treadmills, where you just put your hands on the heart rate monitor, or you put in your age and your weight and it tells you how many calories you're burning.

How in the world... what kind of formula does it use that it can think it can tell you how many calories you're burning? I mean, it seems like it's gotta be the most inaccurate calculation around. Am I overplaying this? Or is that, is that right?

Kirsty: I tend to agree with you there. The reason being is, as I said, the normative data itself that they're using these equations for is generally on university students or someone who has time to do these sorts of studies. And they're not really the general population to start off with. And then obviously can't account for genetics, lifestyle, epigenetics.

So the impact of lifestyle on those genes, muscle mass, all that sort of stuff. So it might be a good way to gauge how intense your workout is. So you get to know your own numbers and say, "Oh, I'm slacking off a bit today." But in terms of using that as a premise of how much to eat and how many calories you burn, I definitely wouldn't be too confident with that.

Bret: Yeah. Good point though. Following the trend, if again, you're consistent with a protocol and it's sort of the same machine and you can compare your workouts to see, "Okay, I burned more calories last time. So I got to turn it up a bit" and don't worry about the absolute numbers. I think that, yeah, that's a good point you made there.

Kirsty: If you want to be doing high intensity sort of exercise, which maybe we can get onto a bit later, because it's not the best for some certain individuals and depending on their metabolic health markers and things like that.

Bret: Okay. So, let's run with that. Let's talk about exercise, but we'll get back to DEXA later. So let's talk... because no, this is great. Because everybody can exercise, not everybody has access to a DEXA. So this is probably more pertinent for most people. So, you know, we hear a lot about Zone 2 cardio, resistance training, high intensity interval training. Like those are, in my mind, sort of the big three pillars of exercise.

And depending on what your goals are, may determine which one's better for you. So how do

you see those three types of exercises? How they affect lean body mass? How they affect metabolic disease? And how they affect metabolic rate? To in your mind, say, what is the healthiest approach for people to do for their exercise?

Kirsty: In terms of the best approach to exercise, it's the one that they're most likely to do. So a lot of people say I'm going to go to a gym. I'm going to be doing really high intensity exercise at least initially because they quite exercise-compromise, they're low in confidence and those sorts of things.

But in terms of when each of those might be appropriate, so for example, if someone's losing muscle will have a low metabolic rate, resistance training is a must. And there is some evidence to suggest particularly is when you can build up to exercise to failure, it gets a double whammy because there is some cardiovascular components to that as well.

In terms of the cardio aspect, is if someone's not metabolically flexible, they're burning glucose as opposed to fat and they go to a high intensity workout, they're going to deplete their glycogen stores even further, which might send off those starvation and hunger signals. So think about what you might want after a hard workout at the gym.

It's generally not good nutritious food. So essentially, it can have some negative consequences, release things like cortisol, the stress hormone. So for those individuals, it would be better to start with steady, slow cardio. But for those who are burning fat, there are some extra benefits in doing that HIIT interval type training, particularly in terms of the enzymes that target, for example, the fat around the liver.

But I see it all the time in the clinic, we get people who are slugging it out in the gym and getting no results. Feeling tired, feeling frustrated, and it might be because of, as I said, some of those metabolic parameters aren't suited to what they're doing.

So over here in Australia, I know a lot of people who do those HIIT type classes and they're great, they get fit, but they don't get the desired outcome of losing weight and they might not feel the best. And that's because some of those physiological responses I mentioned before, and they may be better to do a resistance-based training or a low intensity cardiovascular disease steady state until they develop that metabolic flexibility.

Bret: Yeah, that's a great example. And using that respiratory quotient that you can measure, once you see them sort of creeping towards the fat burning that they're getting down towards that 0.7, then you could... it sounds like, then you could say, okay, now if you want, you can start doing the high intensity interval training. You're likely going to see more benefit than you would have before when you were just a carb burner.

So that's a great utility for that test. That's really interesting. Now you also recently tweeted something on your Twitter account about exercising, fasting, and what that can do to your metabolic rate or your fat burning while exercising. So what do you recommend for people to when they should exercise fasting, maybe when they shouldn't and what kind of differences they see?

Kirsty: Yeah, this is a common question. Once again, is when should I do my fasting? When should I do my exercise? Once again, as a general rule, do your exercise when you're more likely to do it. There are some extra benefits if you do a fasting, and in terms of the enzyme changes, the fat utilization changes. However, as the article highlighted, it's quite individual.

So what it looked at is, for example, diabetics. They don't get the same enhanced mitochondrial effects and adaptations as the general population, and I suspect it's down to that metabolic flexibility. So once again, if we can test and not guess, it can say who might be appropriate for those fasting, exercising fasting.

So a sign without testing might be if you do a workout and you're feeling dizzy, you get the shakes and you're really hungry afterwards, that might be a sign that you're not burning fat as a main fuel source.

So you might want to, as I said, eat a bit more regularly until you get to that point where that's not the case. So that was my take on that new study, once again, is we can't apply that blanket response. Yes, there are benefits to exercising fasted but may not be appropriate for everyone and particularly those with chronic disease who have some metabolic consequences such as metabolic inflexibility like diabetics.

Bret: Yeah. So that's really interesting. So those with diabetes did not see the same benefits to fasting exercises those without diabetes. Now, what if you took that group of diabetes and did resting metabolic rates and respiratory questions on all of them and saw - could see if some did do better than others within that subset and where they stood on those results. That would be really interesting. And then that's just one more utility for this testing to help direct people to the best type of exercise. Would be interesting.

Kirsty: Absolutely. That's why I'm so, I suppose, passionate about the science of indirect calorimetry particularly in a clinical sort of setting because there's only so much funding and time we can get to do these sorts of studies. But if you can have that client centric approach, that's when we're going to have the most, I suppose, transformation within the N equals 1 sort of scenarios.

Bret: Yeah, I mean, this brings up an interesting issue for the individual. Like how many people can access this? You know, is this widely available for people that pretty much anybody could access it and afford it and get this individual feedback? Or is it sort of a smaller subset of the population who can access this and then the rest of the population hopefully can kind of learn from that and decide if it applies to them or not? So what is your assessment on how accessible all these tests are for the average person?

Kirsty: At this present stage, it's definitely more accessible, but I still think we have a long way to go. So as mentioned previously, due to some of the restraints in terms of costing, you know, time it takes and those sorts of things, this testing was only available in research and on elite athletes.

So the two ends of the spectrum, whether the people in the middle are the ones that need it most. So essentially now like the likes of who I work for Metabolic Health Solutions have developed something that essentially, the aim is to test the world's metabolism, making it available for practitioners, so that we can get that wider reach and that bigger impact.

So I know here in Australia, we've got people using indirect calorimetry devices in clinic, also the universities offer it. However, some of them only look at metabolic rate. So I would advise one that also looks at respiratory quotient as well. So definitely more available.

But at the moment, it's not like a blood pressure cuff. It's not on every GP table, whether I'm a bit biased, I think it should be because of that valuable data it can provide. And we shouldn't judge a book by its cover. We could actually actually see what's going on for such a big driver of weight, chronic disease and general health and obviously performance for some people as well.

Bret: Yeah, it seems like it would be really helpful to have it on every GP's counter. So what's it going to take to get there? I mean, I would assume it's just a price thing, right? Or is it really also like a knowledge thing that just not enough people are aware that it exists? What do you think?

Kirsty: I think there is a bit of both. Essentially is from a price point. Some of the research grade devices they're not really applicable for, you know, a small practitioner. So over here, a lot of dietitians, exercise physiologists are the ones who would be able to utilize this data, have their own businesses. So it might not be applicable yet. For example, we're exploring, for example, paper tests like some of the body composition machines to make it a little bit more readily available.

But also in terms of knowledge base and innovation, it's similar with everything. Like, you know, I think we've may have been on this podcast that had a look at in hospitals, there was all these infection rates and people dying. And one guy said, "Well, maybe we should wash our hands." And he essentially got laughed at.

And now looking back on that, you say, well, that's a bit silly, isn't it? So I think it's that innovation and knowledge base as well. But as with a lot of things nutrition and science, everything is evolving, and that's my hope for the future, but small steps in the meantime.

Bret: Yeah, okay. Well, now I do want to circle back to the body composition testing as we got a little distracted, but a good distraction there. So we were talking about the DEXA scan, how it compares to the bioimpedance. So I'd like to get your thoughts on, you know, what the benefits of DEXA versus bioimpedance? You know, why would someone want to do a DEXA or why would they not? And then also what about the others?

I mean, there's hydrostatic weights, there's this Bod Pod, there are other ways to do it. If you can give us sort of a lay of the land of the framework of what's out there, so people can understand when they're looking to get their body composition tested, what should they be looking for? What are the differences between all these tests?

Kirsty: Absolutely. So DEXA is what I suppose is known as the gold standard, but as you say, there are other methods, but they're just not generally available particularly in a non-research setting. So it uses small x-rays, which is why they advise... although it's only really low dose - about once every six months.

So it is, as I said, gives really reputable data in terms of the fat mass and the muscle mass, but also where it's deposited in terms of visceral mass and also does bone mineral density. So that is available. But in terms of depending on what your goals are, it might not be able to be done regularly enough.

And there is also an expense to that. The likes of the hydrostatic weighing and Bod Pod, I haven't had too much exposure to, but what I would say is whatever method you use, don't compare between them because they're going to be different. You're more so looking for change over time and that consistency.

Bret: Yeah, that's a big take home right there. Use the same measurement. Because I've got so many patients who like to do DEXAs and bioimpedance scales on a regular basis and the numbers are completely different. So the first time they step on their bioimpedance scale is usually much lower fat mass than the DEXA.

And they're like, wow, this is amazing. Look what happened to my fat mass. It's like, hold on, time

out, don't get too excited yet. You can't quite compare those. So yeah, that's a great take-home that makes sure you stick with the same type of measurement. Yeah, for sure.

Kirsty: Absolutely.

Bret: So, yeah. How often are you having people follow up? You said you don't have them do the bioimpedance, you know, every day. You don't want to test it all the time. So between the resting metabolic rate, the bioimpedance scales, you know, if someone's changing their diet, what do you say is a good timeframe to retest to say, what kind of impact is this having? And then if things are sort of stable and you've changed your lifestyle, how often then do you test for like a maintenance type program?

Kirsty: Yeah, great question. So in terms of initial follow-ups, particularly if it's dietary intervention, which is generally first, is get a patient in one to two weeks later, and we can generally see change to see if they're on the right track, but also help them problem solve because there is those implementation type issues as well.

And then if something's like an exercise or supplementation sort of strategy, those sorts of things from a clinic practitioner perspective, I'd most probably give it six to eight weeks. However, once again, this depending on the client's confidence and consistency, you might shorten those periods. And then once I'm happy and confident with the results, their results are going as intended, they're really confident with everything that they're doing, most probably be a three to six month interval follow-up.

And what we're really looking for at that follow-up is, as I said, is if they're losing weight, whether it's from fat or muscle, looking at that metabolic decline, but also looking at risk factors for weight regain.

So not only the muscle loss, but if we find that their RQ score, so their fat burning, the RQ score is going up indicating that the fat burn is going down, that is a risk factor for weight regain. So we're catching it early because prevention is better than a cure. So we can authorize questions, educate the patient that that is a case and see what else we can do, for example, to break through a plateau or prevent that regain as well.

Bret: Yeah. That's a great point. That prevention is better than fixing it once it's already gone away. So if you can catch it early. So how much of a change in RQ gets your attention? Because we're only talking about 0.7 to 1.0. It seems like a very small window. So I'd imagine even small amounts of changes might be pretty significant. So, what's the amount of change that really gets your attention?

Kirsty: So to make it easier, and once again, is I'm lucky enough to be using some software which converts everything for me, I have a look in terms of percent of fat and glucose. So we see people burning as much as... or as little as 0% fat in the clinic and if not storing fat.

So I'll say if they increase that to 20%, I'd be really happy with that, to show them that a) we're on the right track and b) that the right strategy has been put in place and can help motivate them. Now to get them up to-- the textbook says we should be burning about 80% fat, some people don't get there. But particularly for optimal outcomes, you want to be burning at least 80%, it might be a matter of time, or it might be introducing another supplemental strategy with that as well.

Bret: When you say the textbook say that's where we want to be, is that you mean like for the healthiest version of weight loss, that's where you want to be?

Kirsty: So in terms of physiology textbooks, they say everyone burns 80% fat at rest. It's the way the body's designed.

Bret: Okay.

Kirsty: So what they're talking about there is, as I touched on before, fat's the most efficient fuel, it gives us the least amount of carbon dioxide and waste products. It also provides that nice stable energy to help with, for example, mood for a lot of people, energy for a lot of people. And it's also in terms of health perspective, maintaining weight, preventing chronic disease, those sorts of things.

Bret: Yeah, but again, those normative data were not done on obese patients with type 2 diabetes. So they are not burning 80% fat at rest, but that's where you want to get them to. So I see now. That makes a lot of sense.

Kirsty: So when we looked at we presented at one of the conferences, we just did a look back at some of our data. And for example, about, I think it was 70% of patients weren't burning optimal amounts of fat.

Bret: 70%!

Kirsty: So therefore, once again, is why we don't judge a book by its cover because we're applying all these general rules to a population that doesn't fit... what's going on.

Bret: Yeah. So, so we've touched on metabolic flexibility, low-carb nutrition, the different types of exercise. You've mentioned supplements a few times. So what are your sort of key supplements that you think can help some people with healthier weight loss, healthier fat burning?

Now one of the big ones we've seen in clinic, and we're not sure whether it was the egg or the chicken sort of scenario, is low vitamin D, which has obviously been in the spotlight with all the COVID things. So essentially what we want to be having a look at, if it is low or borderline, supplementing, following up, seeing the subjective changes within the patients, seeing its impact on fat utilization and their weight loss results as well.

The other one might be, particularly, we see a lot of patients with PCOS, insulin resistance. They might get some Metformin from their GP or the likes of berberine to help to improve their insulin sensitivity. I wouldn't say it works alone, but in conjunction with those lifestyle things that they're doing. And in terms of improving that mitochondrial function, a couple of things we've touched on, the likes of Coenzyme Q10, particularly for those on a statin.

But once again, a lot of people have a broad range of spectrum. They're just a couple of the common ones I might see in clinic. Once again is I had a patient randomly come to me, we weren't getting expected results. She explored a couple of things with an open-minded GP and she got put on DIM, which has helped with estrogen dominance.

And it's not something like that I would have done personally, but we could see some of those changes and validate that intervention with some of the changes that we've seen.

Bret: Interesting. Okay. Very good. Well, I think this has been a wonderful sort of tour through

the practical aspects of these different tests that are available, that you have so much experience in. And like you said, don't guess, test.

So I really hope our listeners were able to take away all the practical nuggets you threw out there about how they can utilize these tests, what they should be looking for, what they can change in their lifestyle and how they can follow it up with measurements from these tests to make sure they're on the right path.

So anything else that you'd like to add to what we've discussed so far? And of course, if people want to find out more about you, where can you direct them?

Kirsty: So one thing that we didn't quite touch on is in terms of also becoming more popular is bariatric surgery. And essentially, what we now know is the reason they've gone from the ring to the sleeve is regain and some other health issues and psychological issues. It's not that quick fix that we once thought.

Some of that data is emerging. So what we found is some surgeons are using this as a way to obviously screen for those who might want surgery. Because there are also some studies that have come out looking at that RQ score, which we've mentioned quite frequently, as a predictor of the weight loss results that we see in some of these surgeries.

So it might be a screening tool, but also a post-surgery as a way of looking at things like compliance, looking at those who are at risk of weight regain. And those that might still need some tweaking because they might be losing weight, but essentially, it's that starvation thing going on. They might not be losing it from the right tissue.

And we hear about it all the time about people, you know, as I said, is, you know, eating the wrong foods or thinking they're doing the right thing, but they're not eating the real foods and those sorts of things. So we've seen patients in the clinic who are regaining weight or plateaued post-surgery and not burning fat.

So it can help titrate those interventions down the track as well. So that's an area that is emerging and will be really quite interesting.

Bret: Yeah, that's really interesting. If you're going to go through the whole process to have this surgery done, it'd be nice to know ahead of time if you're going to see the best results possible or not. So if this is one, and you shared with me that study, which I thought was really interesting, that the respiratory quotient was able to predict with pretty good accuracy those who are going to lose more weight.

And, and actually, we have some more information coming out at Diet Doctor about weight loss surgery, a guide, and we're going to have a podcast on that as well. But some of the surgeons who I interviewed, they consistently like to use low-carb diets and intermittent fasting in the pre-operative setting to prepare people for surgery.

And I didn't think about this till just now, but that would definitely tip the respiratory quotient going more towards the fat burning to prepare them for surgery, which would then make them probably more likely to succeed with weight loss.

But then also, as you said, it's not a cure-all. It's not like you do the surgery and you're done. You still have a lifetime of lifestyle that you need to adjust to maintain a healthy weight and a healthy lifestyle. And so measuring with the indirect calorimetry could be a great measure for that and

that setting as well. So, very good point.

Kirsty: And that's what we touched on before is the more sort of in-house practitioners using this, the better. Because there's only so much the research provides a good basis, but there's so many different applications, which is also why I'm trying to work on a platform for practitioners. Because as I said, the innovation and the knowledge base might not be quite there.

So if we can look at all the data we've collected over nine years in conjunction with what everyone else is doing and provide that platform to say, well, if this is a result, here's some factors, it can really help better inform some of the management of these sorts of cases, which is what we're working on at the moment in the biggest sort of picture. Because that's going to have the best global impact for the current health crisis at the moment.

Bret: Yeah. Very good point. Well, you certainly have a lot of experience with this and you have some great practical tips. So where can people find you if they want to learn more and hear more about what you have to say?

Kirsty: So I'm on Twitter handle @LowCarbEP. The website, metabolichealthsolutions.org, has a lot of information, not only on our proof of concept clinics, which is more of a research based clinic where we help patients, but also in terms of public health and technology, those sorts of things other projects we're working on as well.

Also some blogs about what we've been involved in and general information about this sort of technology. And then also, if you want to pop my email on there, I'm happy for people to reach out if they do have any queries or questions about what we've explored today, which is, as I said, understanding a relatively new topic in those, for those who might be listening.

Bret: Great. Well, I appreciate you taking the time and sharing all your experience and your knowledge with us. And I really look forward to hearing more from you in the future about all this exciting stuff coming down the pipe. So thanks.

Kirsty: Thanks so much, Brett. Have a great day.

Brett: Okay. You too.