



- Steph: Hi, Cliff and welcome back to the show.
- Cliff Harvey: Thanks, Steph. Good to be back.
- Steph: Yeah, we had a really interesting conversation last time about some of the more recent research around keto and low carbohydrate protocols. Certainly today's conversation has a slightly different angle. I really wanted to talk to you about the article titled caloric restriction alters lipid metabolism to contribute to tumour growth inhibition. Let's start with your thoughts around this research.
- Cliff Harvey: Yeah, I think it's really important research. We obviously need to keep delving into the effects of not just the ketogenic diet, but any type of diet on cancer, cancer expression, tumour growth, all those various aspects because at the moment, there's not a lot of clarity around which diet works best for cancer and there's a lot of people who say that diet doesn't really matter when someone has cancer. And so there's a lot of different opinions out there. And so this is an important piece of the research because it's sort of adding to that body that's accumulating now.
- I think there are some things that we can begin to see. But like I say, a lot of the questions are left unanswered.
- Steph: Yeah. It's obviously a huge space and one that I think is more rapidly evolving in recent years, especially now we're stepping away from just looking at cancer as being a genetic disease and really understanding the metabolic nature of cancer.
- Cliff Harvey: Yeah, and I think that's really important. It's important to recognise various aspects that play into that. It's very easy for... You know what this is like, you go to a conference, and if it's a microbiome conference, it's all about the microbiome. If we go to a metabolic flexibility conference, it's all about metabolism and the metabolic state of the body.
- If we go to a genetics conference, it's all about genes. If we take a step back and look at it pragmatically, we can see that it's all those things and more. Genes obviously interplay with environmental factors that interplay with

lifestyle, psychosocial factors. Obviously, nutrition and how that affects metabolism is going to affect anything throughout the body.

And so I think we really need to keep delving into this to look at the interplay between genes into the epigenome and how our nutrition and lifestyle affects that epigenome, affects that expression, and particularly in this case, how our metabolic state and how the fuels we're providing to the body could affect cancer growth and cancer progression.

Steph: Yeah, it's obviously really multifactorial and I guess that's I hope where people are really starting to look at the new treatment models. Certainly I've been following and I know you do to the work of Dom D'Agostino, at a seminar recently that I went to, it was very much about that multidisciplinary approach of understanding how we treat cancer and certainly not getting rid of current treatment interventions, but looking at what else we might need to do, seeing as we clearly haven't solved cancer yet.

Cliff Harvey: Yeah, we need to look at it that way to be truly holistic. There are a lot of people in the complimentary medicine, complimentary health field who would sort of reject a lot of the Orthodox treatments. Conversely, there'd be a lot of people on the Orthodox side who would reject complimentary treatments. And we need to understand that we can't do that if we're going to be truly holistic.

So we need to approach that idea of holistic medicine through the lens of evidence basis, I guess. So what does the evidence tell us now? Where's that research heading? And as practitioners, what can we draw from it to be as effective as we can be and as safe as we can be? In the understanding that we're not oncologists, we're not necessarily oncology researchers, we are practitioners trying to do the best we can for clients who are at a lot of risk. Once they come to us with cancer, often, progression is very fast, often survival times are very low. And so we really need to do all that we can do to get the best results while not putting that person at further risk.

In that respect, we're translational, and I want to make that clear to the readers as well, sorry, the listeners as well, that I'm not an oncologist. I haven't done oncological research, but I am nutrition researcher specifically in the field of ketosis and ketogenesis. And so that obviously crosses over a lot with some of this emerging research around cancer treatment. I've worked with cancer patients for basically my entire time in practice, which is over 20 years now. And so I think that puts a somewhat unique spin on it because having the research basis and then the translational aspect of putting that into practice, you have to develop a pragmatic approach really, because you're really trying to do the best you can while, like I say, minimising harm.

Steph: Yeah, and I think this particular study is quite interesting because they were looking at caloric restriction and the ketogenic diet and of course, both can be low carbohydrate in nature and so they can be similar in that macronutrient profile, but what differs obviously in this particular piece of

research was the overall calories that were consumed by each group. So can you talk more to that?

Cliff Harvey:

Yes. So in this particular study, there was a control group who were eating a sort of standard chow type diet for the mice in the study. There was a group that was restricted by 40% of their calories. So their daily calories were reduced by 40%. And that was predominantly from the carbohydrate intake as well.

So in effect, they were on a low carb diet, but it was a calorie restricted one. The other group were not calorie restricted and they were eating a ketogenic diet that consisted of around 90% calories from fat, about 9% from protein and from memory, about what would be for 1% calories from carbohydrate. So very, very rigid ketogenic style diet. And it was found that the only... One of those diets that inhibited tumour growth to any great degree was the calorie restricted one.

Now, that's not inconsistent with what we know now. Because we do have a fairly good amount of evidence now showing that fasting is very effective for cancer treatment and particularly so around chemotherapy treatment. It also might have that compounding effect with radiotherapy treatment as well. We typically also see that with a ketogenic diet in humans, but if we sort of take it back a step, like I said, this study wasn't inconsistent with what we know now because we know that a calorie restriction works.

What I think is interesting from this study, is it's really starting to, I guess, solidify that approach that many of us take that it's about reducing total fuel availability to cancer cells. And this is something I've written about quite extensively. This is something I teach when I'm teaching ketogenic nutrition science to my students, is that we need to be aware that cancer cells can become very flexible. And so for example, certain cancer cells and certain cancer types will become very aggressive in the presence of high ketones.

Some can become very aggressive in the presence of high fatty acids. Cancer cells can use other fields as well, like the amino acid glutamine. And so it's a little bit simplistic when people make the case that well, cancer cells are predominantly glycolytic or in other words, sugar burning, and therefore if we reduce carbohydrate in the diet, that's going to effectively stop cancer cells, because that may not always be the case.

So this study really is just providing further evidence for that to some degree. What's probably most interesting to people is that the ketogenic diet when it wasn't calorie restricted, didn't really have a marked effect on tumour growth. But then there may well be some other sort of confounding factors within that and we need to certainly consider those and look at the progression of research from in vitro, in the test tube or in the Petri dish, through to animal in vivo, like this one where we're looking at animal subjects, and then translating that through to what are we seeing in practice and what are we seeing in the human studies that have been done thus far?

Steph: Yeah, so obviously, nearly every cancer is very unique in its progression and mechanisms. So is or has what has happened been that certainly some cancers respond to ketosis because that particular cancer is obviously glycolytic in nature, but perhaps there's been an extrapolation that that could apply to all cancers, which is incorrect.

Cliff Harvey: I think that's exactly the case. This stems from the idea that cancer is, in an absolute sense, just sugar burning. And it's not actually the exact theory, but this is the Warburg sort of theory, which is that cancer cells are predominantly glycolytic. Well, that cells that are predominately glycolytic, will only use glucose for fuel and therefore these cells that aren't... Or, sorry, these types of cells can't use other fields.

The Warburg effect, I should say, not the Warburg theory. And that's really been taken to mean that all cancer cells and all cancer types will thrive in a glucose rich environment. And therefore if we reduce carbohydrate, we're going to get better outcomes. There has been observed though, and this has been observed in quite a number of studies, something that they call the reverse Warburg effect. And that's the effect whereby when we reduce glucose availability, and maybe there's a lot more of another type of fuel, particularly that ketone body, so the ketone body Beta-hydroxybutyrate, cancer cells can be flexible. So they can start to use other fuels instead of glucose, and in this case, they'll be using Beta-hydroxybutyrate, that main ketone body as fuel.

And so it really depends to some degree on the cancer cell, the cancer type and the person. Because one thing that's certainly clear is that we can't consider cancer just to be one disease. Different cancer types are going to have different proclivities towards fuel usage. So some might be predominantly glycolytic. Some might have a much greater tendency towards being able to use ketones for fuel. But even within a cancer type, you might have various cells that are more or less glycolytic or ketolytic. And that can occur within the same person as well.

So someone might have cells of a particular type within the body, some of which are better at using ketones, some of which are worse. And so it does make it quite confusing. And so the question I often get from my students is, "Which cancers do which?"

Steph: Yeah. What everyone wants to know.

Cliff Harvey: Yeah. Exactly. And I don't think we can necessarily answer that question right now. Mainly because there just hasn't been enough research. There have been studies for example that compare certain types of breast cancer like the Henrietta Lacks... Sorry, that was an ovarian cancer, wasn't it? The Henrietta Lacks line of cancer cells, which can be quite good at using ketones, comparing those to human pancreatic cancer cells that are somewhat resistant to that and are much more glycolytic.

In terms of brain cancers, which we typically tend to think as a prime target for ketone therapy or ketogenic diets. Glioblastoma is typically, in the

research that I've seen at least, tends to be fairly glycolytic and not so ketolytic. In other words, it's a good sugar burning type target, whereas anaplastic astrocytoma, another type of brain cancer might be quite different with respect to that as well.

But again, if we're looking at the individual cells that have been essayed, they can have quite different responses as well. So again, we're left with a bit of confusion because we might have some indication from the type of cancer and that might guide us as clinicians to change up the nutritional strategy a little bit, but can we actually be that confident that what we're doing will not drive some cancer growth?

So this is why I began quite a few years ago to really look at this idea of total fuel availability, and then to try and put that in the context of the research as it stands. So what that basically means is, a lot of people are chasing ketones. We have cancer, people think, "Well, we want to start with glucose. So therefore, we should go on a ketogenic diet, and we should try and get our ketones really high, and our blood glucose down to... Basically as low as it can be within that low normal range." In other words, have a really high ketones to glucose index.

I don't necessarily agree with that because we can see in the research that when we flood certain cells with ketones, they become good at using them. And so I sort of look at that as being, why would we boost a fuel as high as we could possibly get it when there is potential that cancer cells can basically morph to be able to use them? It makes more sense to have the least amount of fuel that we need in order to thrive and that comes from a range of different sources.

So, I often do use a ketogenic approach with my cancer patients, but it's certainly not one in which we chase higher and higher levels of ketones. It's one in which we have enough fuel and enough fuel availability for the person to feel good to have a properly functioning immune system, to try and reduce inflammatory damage to try and reduce excessive oxidation and excess glycation from a diet that's too high in carbohydrate and sugar, but not so much that it's potentially going to drive that flexibility hopefully. So we're really taking a more, I guess, prudent approach where we're looking at the best course, that is the safest because it reduces the amount of fuel that's available to drive that growth of tumours.

Steph: Yeah, it totally makes sense. Like until we know that a particular cancer isn't then going to feed on ketones, you can't possibly be running the risk that you're perpetuating the problem. It's really dangerous without that clear knowledge, that clear literature.

Cliff Harvey: Yeah, absolutely. I think so. There may be some application that's discovered where we really do want to drive high ketone levels, and we might in certain other illnesses think that that's already the case. For epilepsy and seizure control and things like that, there is a really good case for having higher ketone levels than what someone else might require just to feel good and should have enough fuel to function. In this case though,

we always need to marry up what could be with what we know now and try and take the safest course because when we're not doing that, it becomes very cavalier and we simply don't know whether we're driving negative outcomes.

So I think we need to be really clear about that. And so I've been quite vocal about that idea that at this stage based on the evidence, it does seem that on balance, ketogenic diets tend to have performed really well in the human research so far. They tend to be tolerated well, they tend to have very good compliance and particularly people who have metabolic disorders, insulin resistance, pre-diabetes, things like that, who are at much greater risk of cancer, they tend to adhere to low carb and ketogenic diets better anyway.

So it doesn't necessarily mean the strictest ketogenic diets but a low carb or keto diet approach of some sort, people typically comply with better, like I say they're safe, they tolerate it well, and we do see an indication towards there being better survival times. But we wouldn't want to sort of subvert those great results by just arbitrarily trying to push people as deep into ketosis as we can, if there's potential there for driving cancer growth, because it's probably just unnecessary at best and might be really negative at worst. And so there is a real sort of common approach that is probably safe, that seems to be effective, and that is probably giving us the best results while not sort of pushing people to a place that I want to be.

Steph: Yeah, so then with the caloric restriction model, the mechanisms are obviously a little bit different, even though we're still seeing the low glucose and low insulin levels. So in this particular study, how did that differ if we're looking at caloric restriction versus ketogenic or low carb?

Cliff Harvey: I think overall it was still about total fuel availability. So there was a lower level of glucose just through particularly in the fluid surrounding the tumours. So not necessarily in the bloodstream, but the fluid surrounding the tumours, there was lower glucose than in the ketogenic diet. Because in a ketogenic diet that's replete with calories, lots of calories, there's still going to be that potential therefore there will be greater fuel availability, including from glucose. When we're calorie restricted, we're just going to have lower total fuel availability overall, which is really the goal with cancer treatment.

So, what that would then lead people to think and we need to be cautious about this as well, perhaps for the best results, we just want to be calorie restricted. The problem with that is a sort of medium to long term same approach is as we well know, one of the biggest risks with cancer is the cachexia muscle wasting. And if we're calorie restricted for too long, and we begin to basically waste away, that's not going to lead to the best long term outcomes.

So it's one of those interesting things where calorie restriction and fasting is probably really beneficial for the treatment of cancer based on what we can see in the research now. But obviously, people just can't starve themselves forever. There needs to be some sort of progression back. And I think within

that context, that's where we need to be a little bit cleverer, I guess around how we reduce the total fuel availability to those cancer cells, return people to closer to normal calorie levels, and still basically get similar results. So maybe we still use for example, fasting around chemo treatment. Maybe we use intermittent fasting. Maybe we use lower carb and ketogenic approaches.

And what we also need to consider within that is we need to take these results and look at the context that they were applied. The first context really is that they're applied in mice. And mice are typically not great responders to a ketogenic diet. So they have some challenges; increased rates of gluconeogenesis, and things like that, which we don't see to the same degree in humans because humans are pretty well adapted to being in ketosis.

We also need to look outside of there at the psychosocial and behavioural aspects of diet that really affect the human specifically. And I mentioned one of them, which was adherence and compliance where a lot of people actually adhere and comply better to low carb approaches. But we also need to consider that if energy balance is as critically important for cancer treatment as it is, then which diets helped to promote the greatest satiety and the greatest energy balancing or in some respects, calorie restriction without people having to force it? Because that's the that's the kind of diet they can stick to.

And we know from the research that typically those are slightly higher in protein or much higher protein, they are typically lower carb or low carb and the ketogenic diet has a particularly good effect on that. Especially when there's enough protein in a ketogenic diet, it's incredibly satiating. And so that allows people to order or regulate their energy more effectively and therefore they're less likely to overeat.

Overeating, taking in too much energy full stop is probably the worst situation for cancer. And so in order to have the appropriate energy balance, appropriate levels of protein, to help reduce that muscle wasting, but still get the effects of basically not over fuelling, there is still I think, a good functional rationale for applying low carb or ketogenic approaches if they're done soundly and safely and sensibly, in other words, not chasing ketones.

Steph: Makes a lot of sense. I'd hate to be doing caloric restriction with high carbs. That would be miserable.

Cliff Harvey: Exactly. And one of the interesting things is because there has been some pretty promising research around the ketogenic diet for cancer, particularly in humans, a lot of people have assumed that they do need to chase those ketones, they need to have ketones that are really high. And you and I know that in order to do that, we would typically need to eat quite a lot, we would need to eat quite a lot of fat in particular, and we need to keep our carbohydrate extremely low and our protein pretty low as well.

Now, that may not be driving the best outcomes for a number of reasons. Number one, if you're just loading up on fat in order to try and get greater ketones, you're just providing greater amounts of fuel to the body full stop and to cancer cells. We know that cancer cells can use ketones and we know that various cancer cells can also use fatty acids very efficiently as fuel and so it's not going to necessarily be the best situation.

Number two, with very low protein intakes, we typically see increases in cachexia and muscle wasting. So that's obviously not good for long term survival anyway. But one thing that I've often considered is do we really know the implications of that? We often talk in the setting of cancer treatment as well about things like glutamine, can be used by cancer cells. And some people have taken that to mean, "Well, I don't want to eat too much protein because there's glutamine within those protein chains, so there's glutamine coming from protein foods and I don't want to fuel cancer." But given that muscle is the biggest pool of glutamine in the body, it doesn't make a lot of sense to me either to have a large amount of muscle wasting in which you're freeing up glutamine which can be used by cancer cells.

So actually getting sufficient protein even if there is a bit of glutamine there, if it's supporting the retention of muscle, to me that seems like a good double whammy because you're reducing cachexia and all the negative effects that that has on long term survival. Plus potentially you're actually reducing the fuel availability to those cancer cells by having enough protein.

Thirdly, if we're drastically trying to reduce carbohydrate to basically zero like it was in the study on mice, it leaves almost no opportunity to have foods that we know to have an association with reduced cancer rates and reducing cancer progression, improved recovery from cancer. Like those richly coloured polyphenols and anthocyanins and all the various cool phytochemicals we get from plants, right? Because people are trying to limit those as well to get as little carbohydrate as possible. And I think that's probably detrimental.

We can achieve very good, healthy, low carb or keto style diet while still having enough protein and while having plenty of vegetables and also not drastically overloading with fat just purely so we can get higher and higher levels of ketones. So there's a number of reasons why we can modify the approach to make it a healthier one overall, which is likely to give us the best outcomes.

Steph: Yeah, crystal clear. I am curious -

Cliff Harvey: I hope so.

Steph: It is to me. This is not to everyone, obviously. That's why people are still trying to chase ketones or go vegan or whatever the self belief is around. Yeah, the ideal treatment.

Cliff Harvey: Yeah. We also need to consider, and this is something that I grapple with a lot as a practitioner, I work with cancer patients, a lot of my cancer patients are terminal, have been given very short survival expectations by the time they come to see me. And a lot of them do really well. Some of them unfortunately don't and some of them will pass away. And it's a very difficult thing to work with as a practitioner, but I think I always need to step back and put on almost my sort of objective researchers head and say, "Well, we can only do our best and we can do our best based on the research, we can translate it into practice. And then whether we have a good or a bad outcome, we also need to consider that that may or may not have been as a result of what we did.

There are so many other factors going on with respect to the environment, and environmental pollutants and the effect of stress and media and sleep, whether people can adhere to diet, whether they're just very genetically predisposed to a particular thing, whether there are other factors that have helped with the mutation of genes and things. There's so many other factors going on that we need to have a reality check, which is why I'm very averse when people say, "I cured this," or "I helped someone cure this." Because we simply don't know.

Steph: Again, if we knew we would have solved cancer, and this has been going on, like you mentioned, the Warburg effect. That was first identified in the 1920s. That's 100 years ago. If we knew what we were doing with cancer, we wouldn't have the problem that we've got in 2020. We need the solution.

Cliff Harvey: Exactly. And I think that really does speak to the multifactorial nature of this. There have been for a long time now prospective vaccines against oncoviruses. There have been prospective measures that have been looked at to alter gene expression and all sorts of things but none of those to my knowledge have been that effective to this point because there are simply so many things going on.

And that the human organism is so complex and all the influences that are upon that organism, both within and without, are very complex as well. And so yeah, it's a difficult thing. And we just need to simply do the best that we can with the tools that we have to try and basically do the best job based on the research. But also of course, we need to start this process before people actually have illness. We really need to be working towards better environments, better food environments, better psycho-social environments that allow people to thrive and be as healthy as they can, because then they'll be more resilient to all these other factors that could predispose them to illness.

Steph: So in this study, what is the significance of the 40% reduction in calories? And do we know what percentage is ideal at this point in time?

Cliff Harvey: In short, I don't think we do because with calorie restriction... I think in this particular study, they withdrew a large amount of calories in order to get a decent effect size. And I'm not exactly sure. I'd have to read into the

methods and things as to why they did that. I don't think it's even mentioned in the paper as to why they chose that particular level. If it is, I apologise, but I didn't read that.

But with calorie restriction, it's a really interesting topic because for a lot of outcomes related to restriction, energy restriction, to some degree, you would say well, the more the better. I'm oversimplifying, but if we're looking at reducing fuel availability, then it makes sense that the greater the better. But as I mentioned before, we can't simply not eat, because then there are going to be other ramifications that come in that are going to be far more devastating. So in terms of finding a calorie restriction that works, I don't think we know.

Where my translational side comes and where I start to think about what seems to be the most prudent right now, I think that where we have clients who are excessively adipose, right? That's a nerdy way of saying they hold too much body fat at the moment, where people hold too much body fat and they have problems with maybe insulin resistance and that diabetic picture of having too much body fat, then I think returning people to normal body weights, I'm saying normal in the statistical sense of being at the norm, normal body weights and appropriate levels of body fat. I think that makes sense. And if we have to calorie restrict a lot to do that, I think that's fine.

Particularly where people are taking in enough protein to properly offset muscle loss. But once people are down to a sort of fairly normal body weight with appropriate levels of body fat, it's quite cavalier to then try and continue to drastically calorie restrict, because at that point, we're starting to get all those other things going on, like increased levels of muscle wasting. And that's quite common. I have a lot of patients who had got to that point where they are quite lean, and they can't really afford to lose any more body fat and so then it does become that balancing act of trying to provide enough fuel, but not over fuelling while being replete with all the other things.

And we don't want to forget about those, the micronutrients. Getting enough essential vitamins and minerals, plus all those secondary nutrients we get from nutrient dense foods that are probably anticancer in some form as well.

Steph: So it sounds to me that we might be able to start a little bit more drastic for want of a better word, but then really scale that percentage of caloric restriction relative to the individual and certainly their level of body fat at the time of intervention.

Cliff Harvey: I would say so and I think we certainly have enough indicative research to show that fasting is very effective for that as well. And so even complete abstinence from food can help at certain times. And I think it's probably clear enough now that the evidence is there that fasting, particularly around chemotherapy treatments is very effective too.

Steph: Yes. Again, it's clear why we don't have a set answer because it's going to be really individual. I'm curious though, hopefully this study, I'm sure it has prompted a lot more research around, yeah, exactly how much when we're talking about caloric restriction or if it is just completely going to be a case by case scenario.

Cliff Harvey: Absolutely. I think that's really important for people to consider because what we need to also remember within the treatment of any body is that their presenting complaint is not the only thing. And, you know this as a practitioner. It's not just about the fact that someone's presenting with a particular type of... Well, first of all, that someone's presenting with cancer. What cancer are they presenting with? What research do we have on that? But more importantly then, what else is going on? Does the person have other conditions? Do they have insulin resistance, are they may be holding excessive body fat tissue on the body, which is not going to be conducive to their recovery?

All these very things, all these various other things need to be considered as well, because it's not only about what the person is presenting with, it's what the person is and how they are, how they live in their environment. All those various things are very important as well. And so absolutely, it needs to be on a case by case basis.

I remember a discussion I had with Dr. Eric Helms, not about this specifically, but about the idea of sort of best practice guidelines. And despite the fact that a lot of best practice guidelines are probably not evidence based at this point, still, if we have a general idea amongst us as practitioners and researchers that there is a purportedly best way to go about treating a particular condition, we need to remember that that is the mean. In other words, that's the average of what works best overall. But for any one person, they're not at the mean. And so we can start with an idea, which is the best practice guideline. But we need to almost shift immediately from that to meet the needs of the individual.

So people who are applying almost cookie cutter approaches, whereby it's the same for everybody, it's simply not going to give the best results.

Steph: Yeah. Yeah. I can definitely see how we're getting into some issues with trying to treat it like it's not a confusing disease, because it's obviously one of the most challenging ones to understand, and there are so many nuances within even the word cancer and then of course, within the patient.

Cliff Harvey: Yeah, and there's a lot of on the face assumptions. If for example a ketogenic diet has some implication for cancer, then you'll see a lot of people jumping on there and saying, "Well, then surely dietary..." Sorry, "Exogenous ketones have application for cancer." And they might. I'm not sure. But the reasons where they might, or the cases in which they might are probably quite distinct. They're probably very again individualised. Why am I saying that? Well, again, we go back to their point that we wouldn't necessarily just want to add a whole bunch of extra fuel because that might fuel certain cancers to grow.

And so exogenous ketones are potentially problematic. However, what we've observed a lot in clinical practice is that when people take exogenous ketones, they are often extremely satiated to the point where some of our clients, we advise them not to take them because they're habitual under eaters and they end up not eating enough when they take exogenous ketones.

What I'm getting at here is on a case by case basis, if someone was a habitual overeater, and they took some ketones, which didn't drastically elevate their ketone levels, let's say they got up to one millimolar or so, that's probably fine. But that also helped them to auto regulate the energy intake, in other words that helped stop them from overeating, then that could be a really beneficial thing for that individual. But we would need to look at it on an individual basis. And we certainly can't have a whole bunch of people out there who aren't qualified and not registered practitioners and all the various other caveats we have just saying, "Oh, you've got cancer? Take ketones." Because it's just... It's way too simplistic. And we're almost trying to treat one particular thing like a magic bullet that's going to cure the world's ails and we know that's not the case.

Steph: Yeah. So the last thing I wanted to get your thoughts on is, if we know there are lots of different interventions that could be quite positive, that might have their negatives, like you say, like fasting leading to muscle loss or caloric restriction not being sustainable in the long term, then what are your thoughts on like that press pulse concept where the future directions look like we might do periods of intervention and then a change so that we can, I guess, prevent or mitigate some of those side effects? Does that make sense?

Cliff Harvey: It does. I agree with that with some limitations, I think. I think before we get to that point, and I'm going to sound way over simplistic here, but I think it's important sometimes to try and take these overarching complex concepts and try and at least get some traction on the ground, I think before we start to look at the really clever ways that we could alter diet to get the best outcome, we also need to understand that the commonalities between nutrition for any illness including cancer are probably quite clear even at this point. And that's that we want to start with a diet that is based on more natural and refined foods, nutrient dense, replete in all those nutrients that we require.

That's incredibly important. And I know that someone like you understands that, but I think you and I would both be surprised at the amount of even practitioners who don't always put that at the forefront. Because it's very easy to start to go down the rabbit hole to think about, what can I manipulate rather than what's the foundation?

Once the foundation is set, I completely agree there could be times we're applying things more or less rigidly. There's certainly, I think... A really good foundation for using that approach around treatment times. And like I've already mentioned a few times, I think that the evidence is becoming quite clear that fasting around chemo for example is a really good idea. But of

course, if someone's having repeated chemo treatments and they're practically fasting all the time, that's not going to work either.

So there does need to be an application of different things at different times, maybe fasting for a little while, and then maybe the calories are a little bit higher. Obviously, it depends on what the person can afford to lose in terms of their own body weight, body fat levels. So yeah, absolutely. I think there is a really good application for that. It just needs to again be individualised but always on a foundation of doing the biggest things first.

I'm getting a little bit tangential here, but I'd also include in those foundations real attention to some of the other things that we know can drive negative effects or can drive maybe even genetic mutation and things. That's lifestyle stuff, from getting enough sun, not too much, from getting enough sleep, making sure it's good quality, from reducing our stress, from reducing our exposure to screens, aggressive media, excessive use of social media, all those types of things have a negative effect on health and so we want to take care of all those foundations because they're the big things first.

Steph: Yeah. I love it. I think we often try to build a house from the roof and we forget about those foundations. So really important that we do start with those. And I just look forward to seeing what we can learn over the coming years because certainly I think the direction of the cancer research is looking quite positive, whereas before it was really polarising. It was genetic, there was a genetic camp, or there was a metabolic camp, and it was like, that's it. Whereas now, like you said earlier, we're looking at this more combination, holistic view and I love that and I think that's really exciting to say, "Yeah, what happens in coming years?"

Cliff Harvey: I agree. And in my experience, although they're us holdouts who are not necessarily looking wider than just their particular little scope, I think, overall, we're starting to see much more integration, we're starting to see people talking cross modality or cross faculty at universities and really starting to look at how we can get the best results by integrating these things.

True integrative medicine, not necessarily the weird and wacky quacky side of it, but the truly holistic, but truly evidence based integrative medicine, I think is actually becoming very strong. We have some very good organisations that are pushing towards that. I gave a talk a few years back at the ACNEM Cancer Symposium in Wellington and this is where I first aired to a group of probably 200 doctors and oncologists, these views that I had on the ketogenic diet, but how we can apply it best. And why we don't for example need to drastically reduce protein intakes in our cancer patients and all these various ideas now that have started to sort of drift out into the mainstream.

And so, because of that, I think we're really starting to get better interventions because again, I'm going a bit tangential, but I remember years ago reading a position statement in which a group and I can't

remember who it was, whether I'd even be able to find it. I'm not sure. But it basically said that nutrition played almost no role in the progression of cancer. And then we had another paper coming out shortly afterwards that said that in reality, our best practice nutritional interventions for cancer had probably worsened outcomes for people. Because at the time, and we're only going back here about 10 years, a lot of the advice that people were getting once they had cancer was simply, "Make sure you eat enough, because you're going to lose your appetite and you need to hold your body weight. You need to hold your muscle."

But there was no priority given to the quality of food. Yeah. And so people were told to eat just high calorie foods. So I remember seeing cancer patients who had been told, "You know what? You've just got to drink milkshakes. And you've got to eat ice cream and all that kind of stuff. Because it's high in calories, it's going to help you hold the weight." But we all know now that in conjunction with the genetic picture and the epigenomic effects sort of spreading out from there, obviously, the metabolic aspect is critically important if we're over fuelling cells full stop, they grow.

Particularly very aggressive cell types like cancer which love to grow love to proliferate, far more so than our standard differentiated cell types, which are the normal cell types of the body. So they're going to basically be gobbling up all that extra nutrition and going for it.

Steph: Yeah. I'm certainly glad that your thoughts were, I guess delivered to those people that need to hear it the most, who we can then start to change the way cancer is treated across the globe. It's again, really exciting times. You're so good at taking a research paper, which would be quite confusing for some people to read and pulling out the key learnings and hopefully then that will redirect the broader view of cancer treatment. So thank you so much for your time again today.

Cliff Harvey: It's always a pleasure, Steph.

Steph: I've loved this conversation. So I'll pop the study link in the show notes for those that want to check it out and certainly dive into the methods and more. And then just finally, Cliff, where can we find you online?

Cliff Harvey: Best place to find me and all that I do is at [cliffharvey.com](http://cliffharvey.com). And that's where you can find links to all my social and my other businesses, including the Holistic Performance Institute where I do my teaching, but people can also find that at [holisticperformance.institute](http://holisticperformance.institute).

Steph: Awesome. Thank you again. I look forward to our next discussion, and we'll talk to you very soon.

Cliff Harvey: Awesome. Thanks, Steph.