Dr Ron Ehrlich: Hello and welcome to “Unstress”, exploring stress and health from a holistic perspective. I'm Dr Ron Ehrlich and when it comes to what we should eat as individuals, the idea of what is appropriate for our individual needs, sensitivities and reactions would seem like a great concept. We've been exploring the theme of cancer as a metabolic disease, the importance of minimising insulin levels and the power of ketogenic diets and fasting.

Now my guest today is nutritionist naturopath educator author and PhD candidate Cliff Harvey. Cliff has been working on these very subjects for over 20 years. He's written six books. The titles of which tell you a lot about this guy “The carbohydrate appropriate diet”; “The ketogenic appropriate diet”; “99 things you need to know to lose weight”. We will cover some of those issues today. He's also written a book called “Time rich cash optional - An unconventional guide to happiness”. Another one called “Time rich practice”. Cliff is passionate. This is a quote from one of his books “As practitioners (that’s as health practitioners) we are in the enviable position of doing something we love. We have the opportunity to help people become healthier, happier, fitter and stronger”. Boy, I love that. And then he wrote a book called “Choosing you - A thoughtful inspiring book which takes you on a journey of empowerment self-belief and personal responsibility”. Well, today we chose him. I hope you enjoyed this conversation I had with Cliff Harvey.

Welcome to the show Cliff.

Cliff Harvey: Hey Ron how you doing?

Dr Ron Ehrlich: I'm doing really well. Cliff, I've been so looking forward to talking to you. We've been following through a theme about cancer as a metabolic disease, we've been exploring ketogenic diets and all that and I know you've got a lot of research background in this but you've got a story, your own story which I thought I'd love to hear how you got into this position that you find yourself in now.

Cliff Harvey: Yes, an interesting one because it's probably quite convoluted, to be honest. I mean I started out really got into the nutrition field because of footy. I was a pretty skinny kid as a teenager and I wanted to make the top-line footy team and the coaches came to me and said well you're too small but if you put on X amount of weight not only will you play in the top team you'll captain it. If you don't put on the weight you won't play at all. So, that sort of sent me down this track of looking into everything I could around and strength training and nutrition. And so, I really started with a performance bias and that started to shift when I was first at university and this is really where the low-carb part started was we were told these very arbitrary things back in the day, we must prescribe 65% calories from carbohydrate as a minimum. We had to basically have this primacy of carbohydrate the old food pyramid style guidelines. And the interesting thing was we had learned quite different things in our basic sciences, anatomy and physiology and basic nutrition. We lived the physiology of nutrients and that didn't mesh with what we were being told to prescribe.

And so, as I started to develop plans for myself and for the clients I was working with as a student practitioner when I worked out their caloric requirements and then a lot of their macronutrients within that, the arithmetic didn't work out. When we were optimising protein and even just giving them the minimum levels of fat to preserve hormonal status and to

prevent the incidence of overreaching and overtraining and things like that, there wasn't enough left to give them this very high carbohydrate amount that we were being told to.

So, that sent me off down the track of asking inconvenient questions. And I think as you know I was kicked out of nutrition class at the university for asking those questions.

Dr Ron Ehrlich: I'm not surprised.

Cliff Harvey: Yeah well that was one of the best things that happened to be honest because then I felt like I'd been set free. They gave me a pass which was great so at least I passed the course but I sort of felt set free to look at this pragmatically and to really take what I considered to be a true evidence-based approach to it because I was using evidence. And I was lucky enough in that first couple of years to work with top-level athletes from top-line rugby players through to members of the New Zealand rugby league team through to Olympians and Commonwealth Games athletes but also people struggling with chronic disease and disorder, the morbidly obese people in the 200 kilos plus club. And really got fantastic results from a variety of lower carb interventions ranging from Keto through to moderated carb for the athletes.

And so, I guess in that respect I was one of the first practitioners to really start to apply ketogenic diets in Australasia. This is back in 1998. I really started to do this. So, 20 years down the track it's quite interesting how things have shifts at around and how my practice has shifted around as well through all the various things that I have sort of traversed in that time.

Dr. Ron Ehrlich: Firstly let me say that when we talk about performance and rugby here, people I think listening to this in Australia would know anybody from New Zealand would consider that the ultimate to be playing...but anyway this was in an environment though of not just the food pyramid but a low-fat Dogma which almost makes a 65% carbohydrate essential to if you're going to go low-fat where are you getting going to get your energy from?

Cliff Harvey: Oh, exactly. And that was the thing really was that with the very low-fat guideline because of fear really, how many people were scared of fat. But we've got to remember as well that a lot of people at the time the Orthodox practitioners were also very scared of protein. And a lot of what I was doing originally was based on the revaluation of fat, but it wasn't necessarily always high fat at that time. It was really also the revaluation of the role of protein and how important it was to optimise our protein intake. And at the time there was probably more research coming out I guess around optimising protein intake and how that was the first cusp of change in moving people away from this premise of carbohydrate. So, really, I think a lot of it was driven by protein and interestingly now I think a lot of LCHF people…

Dr Ron Ehrlich: Hang on for our listener…

Cliff Harvey: Low-Carb High-fat. A lot of people in that field are starting to also come back to protein and realise that perhaps those of us or not me necessarily but a lot of people in the low-carb field have also become scared of protein. And so that's shifting as well now.

Dr Ron Ehrlich: Okay, well, I do want to go down and I know I love the fact that you talk about appropriate. The word appropriate is something that figures very strongly in your whole approach, but I wondered whether we might just take a step back and do a couple of definitions for our listeners, so we can kind of put this into an overall perspective. Like people hear the word ketogenic and ketosis. Can you just define that for our listener, not too complex?

Cliff Harvey: Yeah, absolutely. I think what I want to teach my students is it's a really good idea to when you come across words that you don't understand or you're not sure of breaking them down. And I think most people know for example what Genesis means. Those of us who went to maybe Bible School or something when we were younger or at least where we're familiar with it. We know that Genesis means the beginning of the start. And so, when we break that down and we say ketogenesis, we're meaning that that's the creation or the start of the production of ketones in the body. So, ketones are a fuel that can be created from fat in particular but also some amino acids which we derive from protein that can be used by most tissue throughout the body. And interestingly it can be used by the brain and central nervous system. And a lot of people think that the brain and central nervous system only uses glucose or sugar for fuel but in fact, it can use a range of fuels and ketones are one of those primary fuels it can use.

So, when we look at the term ketosis, OSIS is really a term for the state of being. So what's our state of being? In ketosis is that state of being or state of metabolism of which we have those ketones available to use as fuel.

Dr Ron Ehrlich: Beautiful. Can you be on a ketogenic diet without being in ketosis?

Cliff Harvey: Not really because by definition a ketogenic diet is one that encourages the creation of ketones consistent with being in nutritional ketosis. So, really the two are dependent on one another but what we can certainly have is and what we do have all the time, in fact, is the production of ketones. A lot of people don't realise that because they think that to be in ketosis is like an on/off switch. You're either in ketosis or you're out. But when we talk about ketosis we're actually simplifying and saying we're in nutritional ketosis which is a particular level of ketones in the blood. However even if we're eating a non-ketogenic diet, a high carb diet, a traditional standard diet we still produce ketones all the time and we use ketones all the time but it's a very, very minimal amount that I only just show a little sort of blip in the blood really.

Dr Ron Ehrlich: So, when we are in ketosis how do we define that in a measurable way?

Cliff Harvey: It's a good question because the simple answer is there is a sort of line in the sandwich we've drawn as researchers and clinical nutritionists which is a level of beta-hydroxybutyrate which the main fuel ketone. A level of beta-hydroxybutyrate in the blood of greater than 0.5 millimoles per litre. I say it’s sort of a convention that we've developed because it doesn't actually have a lot of strong evidence to show that that is the exact measure. And there probably isn't an exact measurement because some people thrive on a ketogenic diet even if they're the only sort of a point three or point four, other people find

they need a little bit more and a lot of it's going to be dependent on the outcome that you require.

Dr Ron Ehrlich: Well, I love the fact that we have this on/off switch idea about a lot of things. Either you've got it, or you haven't, either you are or you're not but of course there are lots of shades in between so I find that quite encouraging that we're still using our ketones. But another term that we hear a lot about is low-carb. How do we define low-carb?

Cliff Harvey: Great question. I've just had a few battles with peer reviewers for the scientific journals because the definition of low-carb is again so broad. And in a nutshell really low-carb is anything that is under the standard minimum guideline for carbohydrate. So, in New Zealand/Australia it's basically defined as anything under 45 per cent calories from carbohydrate. Now a lot of us would consider a diet that's around 40% calories from carbohydrate certainly not low-carb but it actually is when we look at those definitions like that. So, really, it's a very broad category, there's not really a defined state of low carb but in general, it's basically when people start to be aware of the role of carbohydrate, reduce that carbohydrate and then see where they fit in on that spectrum. And of course, that's why I call it the carb appropriate spectrum because it's not about one type of diet being best. It's about what's finding out what's best for you.

Dr Ron Ehrlich: Because this is an important point because it becomes an exercise in semantics in a way because when you look at the recommended daily intake of nutrients I've seen figures of 300 grams of carbohydrate per day as being a recommended daily intake. And so, when some nutritionist or dietitian talked about low carb it could be 150 or 200 grams. And to other people like Atkins when they start it's around 20 grams isn't it? So, there's quite a range in what people are talking about when they doing their research on low carb, isn't it?

Cliff Harvey: Exactly. And so, that's an interesting point because when you're reading through the scientific literature and you're sort of looking at headlines of low carb diet causes this or this effect this or the other effect, you need to be aware of what they're actually talking about. And so, it does, require us to go into those methods and see what they're actually talking about.

The other interesting thing there is no one really knows. No one knows what an optimal ketogenic diet is probably because there is none it's going to vary between individuals and there's a lot of debates that are probably meaningless. You see people debating online well that you should be under 20 grams of carbs per day, or we should be under 50 grams or no it should be 30 grams. I mean those types of fine differences that people debate they're probably missing the forest for the trees. There are more important things to worry about than 5 grams of carbs here and there.

Dr. Ron Ehrlich: Yeah well, I think this is going to be part of our discussion about appropriate but um back to some other definitions because another one that we're very familiar with this concept that's been almost pushed down our throats is calories in calories out. You should be or this other idea of caloric restriction. What do we mean by caloric restriction? Is it different from the calories in calories out?

Cliff Harvey: Not really. There are two parts of the same continuum. Calories in and calories out is going to be important and I think something that people have missed in the whole debate around where those calories should come from is the reality that we can't get past the first law of thermodynamics even if there are other things that will temper that, the idea that the calories that we take in need to be expended or we're going to get bigger is true. The interesting thing within that though is how do we achieve the proper regulation of calories? And this is an area that myself and my colleagues are really hot on because it's almost been neglected. This is an area that has not paid a lot of attention to because people always talk about calories in versus calories out or no calories don't matter it's all about the types of foods you're eating or the macros that you're eating. But what we typically see is when we change our macros that actually changes our caloric intake if we're eating ad libitum. In other words, as much as we desire.

So, this is a really good example of that as when people eat more protein, typically they are more satiated and they end up Auto regulating their caloric intake better. In other words, they eat a more appropriate amount. So, calories are important but the key here is how do we achieve calorie balance? Because the old-style Jenny Craig's, Weight Watchers where you had to actively portion control and starve yourself they simply didn't work. A great example of the whole debate which can be summarised as in the early days of the low-carb research they often compared calorie restricted high carb diets to ad libitum. In other words, eat as much as you desire low-carb high-fat diets. And guess what? The people ended up eating pretty much the same number of calories. The differences the people on the lower carb diets didn't realise they were restricted because, in fact, they were just Auto regulating their caloric intake so yes it comes down to calories but how we achieve that is important because adherence and compliance to diet are the biggest factors.

Dr. Ron Ehrlich: Yeah, now, this is probably a good point to say we're talking about macronutrients being proteins, fats and carbohydrates, and there are essential intakes for protein. Correct me if I'm wrong here, this is a question, are there minimal recommended daily intakes for fat and protein? And is carbohydrates an essential macronutrient?

Cliff Harvey: It's a great question and this is one of the things that we really need to understand more about and this is a topic that I talked a lot about in my lectures. There absolutely are essential amino acids that we derive from protein and there are essential fatty acids that we derive from lipids or fats. And so, to get in enough of those essential amino acids and essential fatty acids we do need to eat a certain amount of protein and fat each and every day. Of course, we can fast occasionally and things like that but over on balance over time we need to make sure we're getting enough of these things.

The interesting thing with carbohydrate is that there is no essential minimum amount because essential in the nutrition sciences means you need to ingest it, not that it's really important or necessary within the body. There's no minimum requirement for carbohydrate because if we withdraw carbohydrate completely from the diet we can make up for that. We can create glucose within the body through gluconeogenesis or that creation of new glucose and we can also use other fuels. We can directly oxidise protein, we can create ketones which the brain and central nervous system can run on. And so, there's no minimum requirement for carbohydrate.

Dr. Ron Ehrlich: Yeah and this word essential just for our listener I mean there are what 20-22 amino acids. We can produce some, we can't produce others and that's what makes them essential. Is that an oversimplification or?

Cliff Harvey: No that's exactly right.

Dr. Ron Ehrlich: And the same is true of those fatty acids. We can produce some fats within our body but there are some we can't produce and that's what makes them essential.

Cliff Harvey: Exactly. It is those two essential fatty acids, alpha-linolenic and linoleic acid and we just can't create them within the body. So, that's what makes them essential. I think the confusion comes in because people think well glucose is essential inside the body because there are certain tissue types that can't use fat for fuel for example and so they immediately jump to thinking well it's essential. But that's just a difference of definition because in the nutrition sciences we consider essential to mean you must eat it and we certainly don't need to eat carbohydrate. It doesn't mean that carbohydrate is bad or that we shouldn't eat it, it just means that we should eat it according to our requirement not according to some arbitrary standard that people put in place back in the 1970s.

Dr. Ron Ehrlich: Yeah, well, this will lead us into that appropriate discussion. I've been enjoying these diet definitions, Cliff is like doing a course in nutrition. Fasting, I think one of the most intriguing things as we talk we reflect on our ancestral past, but scarcity was a very important part of that ancestral past. We didn't always have an abundance of food so we're becoming more aware of how important that is, what is the difference between intermittent fasting and fasting?

Cliff Harvey: Yeah again a good question. I first gotten into the topic of fasting back in it must be around 2001-2002 when I really started looking into it. I had some clients who were Islamic and they were bodybuilders and they were going into Ramadan and they were really worried that they would lose all their muscle and gain all this fat and suffer poor health because of the fasting because of course as at the time we were pretty much told that if possible you should eat more than 6 times per day, you should eat as frequently as possible to keep your blood glucose stable and to keep a constant influx of nutrients and all this kind of stuff. And there was actually some research around at the time and I looked into that and what I saw was that there was no detriment to performance or health, no appreciable detriment. In fact, most people ended up being probably a little bit better off because they got better at using fat for fuel. Their cardiometabolic indicators like their blood lipids their cholesterol their blood glucose all improved and that really changed my way of looking at things because I was already interested in low carb and keto and had been applying that for several years, but we had still been eating pretty frequently. And the biggest thing that it did at that point was it really stopped us being married to the clock. If you're out and you're busy and you're active and you're doing things there's no point eating on the run because that's not part of our natural state. It's not good to eat when we're in that fight-or-flight response.

So, basically, that allowed us to eat when we're hungry until we're full and then eat again when we're hungry. Of course, things have shifted a lot now where people are actively fasting, and I think that's great as well. And really that the definition though is again quite

broad I mean a fast is any period of calorie restriction it quite extreme calorie restriction for any period of time. And that's why people might consider a fast to be eating say 200 calories a day or 500 calories a day. The old 5:2 protocols started that way where you'd eat normal calories for five days and then low calories for two days. Other people consider it to mean just not eating at all.

An intermittent fasting is when people are doing that frequently. And so, typically that takes the form of say a 16-8 diet where people are fasting for 16 hours and they've got an 8-hour feeding window or it could be 20-4 which is a 20 hour fast and a 4-hour feeding window. One of the terms that are coming in a lot now as time-restricted feeding which I actually really like because that I think sums it up a little bit more effectively. So, you're basically restricting your feedings to various times. And you can do that based on what's going to work best for you because not every fasting strategy is going to work for every person.

Dr. Ron Ehrlich: No, I mean I think this is really fascinating because this idea of six meals a day I mean really this is kind of built literally on the food pyramid and the 65% carbohydrate intake and eat a lot of fatty. I mean you just got to do that to stay and this fear of hunger. I mean yeah like hunger look a great economic model not a great health model but if you were doing 16 and 8 and if you had a coffee in the morning as part of your 16 that wouldn't be so good, would it? I mean this coffee push up insulin… where does a coffee fit into a 16 and 8 diet? I'm being distracted here but go on. I just couldn't help but ask you.

Cliff Harvey: Well, I think there is a minor insulin response to caffeine but it's pretty minimal and on balance, I don't think it really has much functional effect. The interesting thing with caffeine. Caffeine obviously encourages increased fatty acid oxidation so you're going to burn a little bit more fat and again it's a pretty small effect size but it can actually add up over time. And interestingly caffeine is ketogenic. I'll have to try to remember the figures here, but I think it was a two to threefold increase in ketone production when people were drinking coffee with their breakfast versus not. And you got to remember here the breakfast was toast, jam and tea, so it was a very traditional high carb breakfast and people were still producing appreciably more ketones which is why I talk about caffeine as being an interesting ketogenic supplement because it absolutely is.

Dr. Ron Ehrlich: That's very interesting to hear that, but listen you've been doing the research you're currently doing your PhD as well. Tell us a little bit and that you've written several books about appropriate nutrition, appropriate carbohydrate, appropriate ketogenic. Let's talk about this word “appropriate” and tell us a little bit about what that means. Sounds appealing.

Cliff Harvey: It really came from… The idea came from those early days of practice when I was allocating protein and fat first which was not done at the time. Typically, people would apply carbohydrate and then that sort of pay attention to protein maybe but probably not in the right amounts and then whatever was left if people would give to fat. And as we discussed given that protein and fat are essential surely you would allocate those first to try and optimise human potential. So, that's where it came from was that idea that you allocate protein and fat first and then whatever was left in the calories. You basically have as carbohydrate.

What I realised over the years was that the protein intake didn't necessarily always shift as much as the other macros because once you optimise protein then it really comes down to what the person's carbohydrate tolerances and how they burn fat versus carbohydrate. And so, there was quite a big shift there and there are some people that will thrive on a high carb diet, there's no doubt about that. There are obviously people as well who thrive on a very low carb diet and so the idea of carb appropriate is just figuring out what type of diet works best for the individual and what we also need to remember there is that's not always just physiological either. Sometimes people will respond much better to a particular diet in the long term because it's easier to adhere to.

One thing that we've certainly seen in our research is that people probably who are a little bit more on that metabolic disorder syndromes and maybe they've got a bit of insulin resistance they do just tend to adhere to low carb better. And we think it's just because if your problem is that you're really compulsively driven to eat sugar and carbohydrate, telling you to moderate that it's like telling enough alcoholic to just have a quarter of a bottle of vodka. Is it not going to work right? You want to have more, and this is what we hear, and we wrote this in a qualitative paper actually. This is a really common thing whereas the people who were less insulin resistant, the people who are probably a little bit more active may be in better shape, they could typically say you know what? I like low carb, but I do like to have some kumera, some yams some good-quality carbs here in the air and it doesn't really affect me negatively. And it's mainly because they're not being driven to overdo it.

Dr. Ron Ehrlich: So, Cliff, what are the parameters that make it a carbohydrate of appropriate nutrition? What are some of the things we should be considering a carbohydrate intake?

Cliff Harvey: Yeah, it's pretty broad and one of the things that I first started looking at way back in the day was this idea that carbohydrates are activity dependent. And it was driven by that the role of carbohydrate which is as fuel. It made sense that while we had structural aspects and functional aspects with respect to the creation of tissue and the creation of hormones and things like that from protein and fat. Because carbohydrate is pretty much just fuel it made sense that the more active you were the more likely you could tolerate high levels of carbohydrate and in fact benefit from higher levels of carbohydrate.

Now that's true even if you’re a low carb athlete or you're a person who's more predisposed to a low carb diet. It could still be that you're on a low-carb or an even ketogenic diet that includes slightly more carbohydrate because you're more active. Particularly if that activity is predominantly glycolytic, in other words, that sugar burning activity which is high-intensity activity. So, activity is a big part of it. Underneath that is also various factors the probably play a role and the research isn't really there to support a lot of it very strongly but we would certainly say that there's likely to be genes involved with whether you are more predisposed to a higher a low-carb diet, certainly insulin resistance versus sensitivity probably has some role to play but that still hasn't been shown strongly in the research either and we think as well that your baseline metabolic state, basically is how you store fuel and we can see that in the blood through your lipid panel, your cholesterol HDL, LDL triglycerides and your hba1c. We think that those baseline indicators of cardiometabolic health really tell us a lot about whether you should be on a low, very low or moderate carb diet. And we've actually got a paper coming out soon that will hope to show that.

Dr. Ron Ehrlich: Now back onto the key of the metabolic rate because I think we talked about calories in, calories out and that this was important but isn't one of the problems with the traditional approach to that, the dieting part of that, is that yes, for the first few weeks calories in calories out you might lose weight but part of the problem of dieting is that the metabolic rate then changes too with the calorie restriction.

Cliff Harvey: Yeah, that's a problem and so much as if our metabolic rate goes down significantly which it will do that's metabolic adaptation to diet. So, metabolic adaptation to calorie restriction then that might make it harder to adhere. It's not necessarily a problem in and of itself because if we have a slightly slower metabolic rate and we have less requirement for calories that's actually quite a good survival position to be in. But it's a good survival position to be in if you're living a hundred thousand years ago in an environment of scarcity where you don't have a lot of food around.

Nowadays if we've then got a lower metabolic grade and we're surrounded by food and the tendency is at some point to say "Oh, bugger, I'm going to eat" Then we have less resilience because we got a lower metabolic rate, we're not burning through the calories as quickly and we end up relatively overeating even more.

Dr. Ron Ehrlich: Yes, well, the weight comes back on and this is the yo-yo often what people finding themselves in that yo-yo dieting weight-gain weight-loss story.

Cliff Harvey: Exactly. And that's why so much of the work we do nowadays is focused on what I call autoregulation. How can we live and how can we eat in a way that allows us to not have to be so restrictive? We're still going to end up eating the right number of calories, but we don't realise we're doing it. And a big part of that is how the diet is structured, that the biggest satiety factors in the diet are probably protein in combination with some good quality fats, in combination with lots of vegetables. Those things help to fill us up they also biochemically help to encourage satiety and people tend to end up eating less. That works because then they don't realise that they're actually reducing their calories a little bit in order to get back to a normal state of being.

Dr. Ron Ehrlich: Now back up onto the low carb high fat, the LCHF as you said there are times when it is appropriate and there are times when it's not appropriate. Could you kind of expand on that?

Cliff Harvey: Yeah, the main thing is I think if that is going to help you to adhere and it's going to be the most effective thing for your outcomes then it's appropriate. I know that seems a little bit probably parsimonious but what we have certainly observed is that when people are in let's say better baseline metabolic health, their blood lipids look fantastic and their lean and their active, to go on a very low carb diet, if that's going to be harder to adhere to makes no sense because there's no real reason to go on that low-carb diet. The other time would be that if someone does actually have a very high requirement for carbohydrate because they're in a very glycolytic or sugar burning type sport then it wouldn't make sense to necessarily be on a very low carb diet because they still have that requirement for that fuel.

So, really it does come down to number one adherence so it's behavioural and habitual factors and then what's the desired outcome. And one way I look at that is basically the first thing that we should look at before we even worry about splitting up macros is the diet predominantly natural whole and unprocessed food. Is it a good quality natural diet? If it is and I have a client, or an athlete come to me and they're eating relatively high amounts of carbohydrate, but they're ripped to shreds, they're performing well and their blood look fantastic there's no way that I'm going to change them to a low-carb diet because what they're doing is working. On the other hand, if they've got that natural whole unprocessed base but it's still not quite working that's when we start to shift the macros as well.

Dr. Ron Ehrlich: Just taking a step back again here with activity, the word "activity" because I know we started our conversation with you being, you were involved with some elite athletes and activity of course to some people in that area and people who take their sport very seriously and train really hard, is very different from somebody who gets up and just thinks they're going for a walk and that's very active. What are the nutritional requirements for an elite athlete let's say in terms of if they were playing a rugby player would they be on a higher carbohydrate diet?

Cliff Harvey: Typically, yeah. It still going to be appropriate because what we certainly see nowadays there's a lot of athletes are not actually eating the very high carb recommendations that they previously had. One of the reasons is because it like I said earlier on it doesn't work. It doesn't work with the arithmetic because you need to preserve that minimum level of fat to ensure that you have optimised hormonal status and help to avoid the incidence of overreaching overtraining. So, we would typically say you should have at least thirty percent of your calories from fat anyway even if you're having a higher carb diet. Then you obviously need to ensure that you're having sufficient protein to recover and repair and if you need to gain some muscle, all those things you basically need to preserve that amount of protein. And then still then whatever's left can come from carbohydrate.

So, it's unlikely that top-level rugby player would be on a low-carb diet but they're often nowadays on a more moderate carb diet than say they would have been recommended back in the 1980s. On the other hand, there are sports like ultra-endurance where it's very common for people to be on very low carb diets because they want to be as fat adapted as possible because your glycogen stores are actually fairly limited. So, if you're having to go for 24-48 or 72 hours it makes sense that you want to be very well fat adapted so that you're using fat predominantly for your fuel source over that time because you simply would not have enough carbohydrate to fuel there.

Dr. Ron Ehrlich: Because this whole concept of carb loading before an endurance event like if you're a triathlete or an endurance runner, that's going to burn out pretty quickly.

Cliff Harvey: Yeah and for most people, if you're going fast enough you're probably going to burn out the majority of your glycogen stores within about 90 minutes anyway. And the results of research on carb loading more recently have been pretty equivocal and I remember reading a very interesting it was a paper and I think it was republished in the ICC in the textbook of Sports Nutrition and it concluded that perhaps carb loading was actually a placebo effect.

Dr. Ron Ehrlich: Interesting. And if an endurance athlete was preparing for an event I mean to be predominant fat burner this isn't something that you just do a few days before an event, you need to be preparing for it.

Cliff Harvey: You do.

Dr. Ron Ehrlich: That should be life really, shouldn't it?

Cliff Harvey: Well, yeah, you need to allow sufficient time to really up-regulate baseline fat-burning and to also encourage a little bit of that keto-adaptation. So, I mean at minimum we're talking at least a couple of weeks there but really, we're probably talking about three months plus if you're really looking at optimised fat adaptation there. There was actually a paper came out a few months ago and it was a great example of a paper that basically proved what they wanted it to prove. They put people on a low-carb high-fat diet for four days. I think it was four days and then they had them to a time trial and of course their times went way down. I mean by that stage you're basically just possibly getting over the keto flu you might still be suffering from it and you haven't had any chance to fat adapt at that point. So, I mean it's a pretty silly study because what's going to happen.

Dr. Ron Ehrlich: You'd be seeing headlines saying low carb high-fat diet adversely affects sporting performance.

Cliff Harvey: And that's exactly right. The headlines that we see reported from most studies that are terrible I mean there's no nuance there's no understanding of context whatsoever. And now what most athletes who are looking for fat adaptation are doing is they're following a train low compete high strategy. So, they're doing most of their training and most of their daily living very low carb and they're also using ketogenic supplements and things like that and then when it comes to events they're typically using still carbohydrate and sometimes relatively high levels of carbohydrate during the event but they're also often using mixed fuelling strategies that might include ketogenic supplements like MCTS or maybe even exogenous ketones.

Dr. Ron Ehrlich: Now this segues nicely into a discussion on this ketogenic diet. And I love the fact that you made the point that it's not a light switch. You're not either burning ketones or not you were always burning some ketones and I'm guessing by regulating your nutrition obviously you'll be burning more ketones whether you're in ketosis or not is another thing. What are some of the benefits of a ketogenic diet?

Cliff Harvey: They're pretty varied really. I mean the ketogenic diet has been studied for over a hundred years now and it began with epilepsy because they noticed in the early 1900's that if children with epilepsy just weren't eating they'd often improve. And what was basically happening is they were going into a fasting ketosis. And so, then they started to pare down what was actually happening and they found that these kids were in ketosis and so that was studied for a long time and then from there we basically developed different types of ketogenic diets that were a little bit less restrictive because those old style classic ketogenic diets for epilepsy were very restrictive, they were very difficult to do and that was because the levels of ketones required to acutely reduce seizure are pretty high. But the reality is for

most people looking for health benefits or performance benefits. They don't need to be anywhere near as high and so the diet doesn't have to be anywhere near as restrictive.

And so, more recently ketogenic diets have been studied and showing a lot of promise as treatments for Alzheimer's disease and other neurodegenerative disorders, cardiovascular disease, diabetes. Just for weight maintenance and health maintenance in the normal population and also obviously that really promising line of research for particular types of cancer.

Dr. Ron Ehrlich: Yeah because that does lead to something that I've always found intriguing and I've asked other guests on my podcast this and that is that PET scans acknowledge that cancer cells preferentially love glucose I think. And so, it's a great way of locating your cancer by putting radioactive glucose into somebody and then 10 minutes later as long as they've been resting, and it doesn't go into their muscles or ten minutes later up will light the cancers, but has never really been explored therapeutically as you would have thought. So, can you just talk to us about this fuel source idea? I mean yeah, the difference between a healthy cell and a cancer cell. Why is this important?

Cliff Harvey: Yeah, it was a long time ago that Otto Warburg identified that there was this sort of glucose preference and cancer cells. And you're right, I mean there was a little attention paid to that for a long period of time because there's not really any other option if you consider that glucose is your only fuel or it's your primary fuel. But as soon as people started to realise that ketones were a viable fuel for the brain and central nervous system and that we could actually reduce carbohydrate drastically and still be fine and be healthy and function well, then people did start looking into the ketogenic diet for cancer.

And so, most of the research that's been done both in animals and now in humans has shown that on balanced ketogenic diets are probably very effective for the treatment of cancer. Particularly to slow tumour growth and to start to reverse some of that rampant sort of tumour growth and metastasis. There are a few fish hooks in there though because although most cancers almost all the time are predominantly sugar burning glycolytic. There are some cancer lines and cancer types that do use ketones pretty well as a fuel and some cancers can rebound and start to use ketones and other fuels quite effectively as well.

Now how that is actually going to play out functionally we're not sure because a lot of this is in vitro or it's animal in vivo research, often you're flooding cells with ketones that you wouldn't necessarily be doing in the body and sometimes you’re sort of flooding cells with ketones and maybe not helping the glucose there as well. So, you need to sort of look at is there a competitive aspect where glucose is going to be used better by the cancer cell so it's still better to have the ketones there. But we are coming to an interesting point now we would probably say that for most cancers most of the time a keto diet or at least a lower carb diet at the very least is likely to be beneficial. But I still take a cautious approach and a pragmatic approach where I definitely do look within my patients at the type of cancer they have and whether it's predominantly catalytic or glycolytic and make a call based on that.

Dr. Ron Ehrlich: What cancers are more sensitive to a ketogenic diet than others? Can you list some of them?

Cliff Harvey: Yeah, I'd probably have to get back to you with an exact list. I don't want to sort of say something they're not going to be incorrect, but a lot of the other brain cancers have certainly shown the most promise on the functional research that's been done on ketogenic diets. There are various sort of lines and so you really need to differentiate between the actual cancer cells that have been biopsied in the patient and look at that directly because they can be quite different even if they're in a similar part of the body.

Dr. Ron Ehrlich: Glucose is one fuel that cancer cells use but there's another one that our listener will now be familiar with and that is glutamine. And glutamine is a lot more tricky, isn't it? I mean low-carb will address the glucose aspect of it but glutamine being such a common amino acid, how do we control glutamine as a fuel source for cancer cells?

Cliff Harvey: Yeah, I mean it's very interesting one because I think the answer is no one really knows and people who claim to know I would say perhaps are leaping a little bit too far they're jumping the shark because glutamine is the most abundant amino acid in muscle tissue. It's very easily liberated particularly if you are under a lot of stress whether that be from say chemotherapy or from the psycho-emotional stress of having cancer. I mean this is a tough situation to be in. That stress response is going to drive gluconeogenesis but it's also going to drive potentially the liberation of glutamine because you're breaking down tissue. So, it sorts of points to the multifactorial nature of how we need to treat cancer. We can't just say well the keto diet is going to work and it's a magic pill. Excuse the pun, I know Pete's just made his documentary on that, I didn't mean to do that Pete's a buddy, he is a good guy. But it's not certainly going to be a silver bullet there. Neither is the avoidance of protein for example because people freak out about protein because it's going to provide glutamine. But when we consider that most of the glutamine that we're going to potentially use is probably going to be freed up from tissue we break down and cancer cells will co-opt cells around them to either produce fuels or they will encourage the breakdown of cells around them to give them the fuels they require.

We need to look at this pragmatically and holistically. That's why I typically say that on balance what we can see is that lower carb diets are better because there's less glucose load. And glucose is the preferred fuel but then we need to look at reducing stress, reducing catabolism or break down a tissue and ketones could help with that as well. I would say we also need to not oversupply ketones. Now I could be wrong in there but one thing that I talked about with my colleagues a lot is this idea that people are chasing higher and higher levels of ketones but that doesn't seem to make sense because total fuel availability is a critical part of anabolism. If you're going to have cells growing and multiplying if you're providing lots of an alternative fuel and they do happen to be able to become catalytic and use it you're certainly not going to be helping yourself. So, I think keeping fuel overall and balance is a critical thing. Not having too much sugar not oversupplying carbohydrate, not oversupplying ketones and having appropriate levels of protein intake with all the other goodies that we need from vegetables and things like that.

Dr. Ron Ehrlich: This goes back to your sort out the macronutrient requirements for an individual of their fat and their protein based on the individual's activity, genetic makeup, metabolism etc.

Cliff Harvey: Exactly. I think for a lot of people who are looking at prevention not treatment, it's actually easier than they think because if we base our meals on vegetables and we try and get up to that nine plus servings of vegetables a day and we have good quality fats with them and we make sure we have a good serve of a protein at every meal really that takes care of all of our bases. Then if the person wants to eat some extra good quality carbohydrate on top of that, typically they end up auto-regulating pretty well. And because people don't need to be all keto all the time that works very well for adherence because people can get it. They can understand what a plate of food then looks like.

Dr. Ron Ehrlich: Okay, Cliff I love some of these expressions you're using about appropriate nutrition and autoregulation. This is very empowering, very empowering. Now listen you also use this term which I hadn't heard but I think people who are struggling with the ketogenic diet may certainly go "Uh-huh, so that's what it is". Tell us about keto flu.

Cliff Harvey: Yes, okay. So, keto flu it's an interesting one because when we started looking at that doing some research a couple of years ago it was a term that I had thrown around and people in the Keto space have thrown around for a long time and when we looked in the scientific literature there were no instances of the term at all. And although people had looked at some of the adverse effects generally of ketogenic diets no one had specifically looked at this keto flu period which is their first few days of a ketogenic diet. And yet when we looked just through a Google search there were over 22,000 results showing keto flu in the common literature but zero in the scientific literature. So, basically, keto flu is when people go on a ketogenic diet they obviously restrict carbohydrate drastically and they can sometimes experience some adverse effects and they range from nausea to headaches to muscle weakness to cramps to light-headedness. And it feels a little bit like that early onset of the flu. You just feel pretty crap for a few days and it basically results from a few things that the main thing is that when you go on a low-carb diet you have lower insulin levels overall and that changes the way that the kidney is excreting nutrients.

So, basically you get rid of more water, you get rid of more sodium and you get rid of more potassium. So, you get rid of basically more water and more salts and that changes your electrolyte balance and you feel pretty crap as a result. There's also a little bit of a lag there where perhaps you don't have the fuel that you used to which is sugar and you need to supply something else and your body hasn't caught up and it's not producing enough ketones yet and so, you don't have enough fuel. And, so what can also happen there as the body goes into a little bit of stress because it's trying to free up a little bit of extra glucose through a breakdown of tissue to supply some of that fuel as well.

Dr. Ron Ehrlich: So, are there some specific supplements or nutrients that can help people through this problem?

Cliff Harvey: Yeah, definitely and it's quite easy to mitigate. When we look at the things that are actually happening in keto flu it tells us pretty much what we need to do. We're flushing out more water so people need to make sure they drink a little bit extra even if it's just a couple of extra glasses a day that's typically enough because we're flushing out extra salts, people should take a little bit of extra salt throughout the day and even an extra half a teaspoon to a teaspoon of salt added to food through the day is probably going to be

sufficient. And we actually recommend or my team now recommend that people use low salt for those first few days if what that is it's the potassium sodium blend that people used to use if they were reducing sodium in their diet because it has sodium, but it also has potassium in there as well. So, you are getting both potassium sodium.

Eating plenty of veggies in those first few days of the keto diet also helps provide that potassium. Typically, when people do that they have enough water, they have enough of those electrolytes, sodium, and potassium. They typically feel a heck of a lot better. If they're not, then that kind of tells us that it's probably also related to fuel and then adding some extra fat can help but particularly adding smart fats like MCTs which are ketogenic they are converted basically straight away to ketones and they also encourage ketogenesis of other fats, they can really help.

Dr. Ron Ehrlich: MCTs being?

Cliff Harvey: MCTs are medium chain triglycerides.

Dr. Ron Ehrlich: I knew that, but I just wanted our listeners to know.

Cliff Harvey: I know that you know, and I appreciate you pulling me back sometimes and explaining to the audience.

Dr. Ron Ehrlich: That's okay. So, MCTs are providing. Is coconut oil an MCT?

Cliff Harvey: Yes and no and there's a lot of debate around it. It is. Structurally it is but it's predominantly lauric acid which is a c12 fat. In other words, it's got 12 carbon chains. That's the longer end of MCTs and there's a lot of debate as to whether that functionally is ketogenic. Now a lot of people say that it's not and it simply doesn't work that way. I actually think they're incorrect and we're going to do some research on this because we've observed clinically that lauric acid although it's not as good as the other MCTs it's still ketogenic. The difference is that instead of maybe 90% of it being converted to ketones or sorry… instead of about 90 percent of it going straight to the liver to be converted to ketones, it's somewhere between 30 and say 60 or 70 percent. So, it's still ketogenic but maybe not as much as the other MCTs.

Dr. Ron Ehrlich: But MCT you can take it as a supplement?

Cliff Harvey: Yeah, you can buy it as a supplement. It's typically in oil or you can get MCTS powders now. The MCTS oils are nice and easy. You can just add them to your coffee or to your smoothies or have them as part of your salad dressings. Super easy, very inexpensive and they are proven ketogenic supplements. I mean I did my master's degree in MCTs and so I've spent a lot of time with them.

A lot of people now are also using exogenous ketones to help get over that hump if they feel about a brain fog or some of those symptoms of keto flu in the first few days. They just basically take a sachet of exogenous ketones which are directly ketones so they're actually ketones in a supplement that you can just take they provide ketones straight away along with

some extra salts because they're typically bound to salts. And so, it really helps hit that just our keto flow from both directions.

Dr. Ron Ehrlich: Does the low salt combo… I get that that is as opposed to just being sodium chloride low salt is replace the sodium with the potassium. How does Himalayan rock salt fit into that equation? Well, that's still too high, that doesn't have enough potassium?

Cliff Harvey: It's still great because it obviously provides for the sodium that you require but because a lot of people are probably a little bit low in potassium anyway it does have that low salt does help to just cover off that base as well. It's not absolutely necessary because I typically find that when people are adding a few extra salts of their meals and they're having plenty of veggies which sounds weird on a ketogenic diet but there is a method to the madness they are getting enough potassium as well. The reason I say it sounds a bit weird is a lot of people drastically reduce vegetables because they feel that they can't have any carbohydrate whatsoever on a keto diet. But green veggies, those fibrous vegetables, they actually provide very little usable carbohydrate anyway and they provide bulk, they provide prebiotic fibres that the body can actually convert into ketogenic by-products in the body and the carb load that you're getting from them is not high enough typically to inhibit you getting into ketosis. So, it's just worth having them for health and for the other general benefits.

Dr. Ron Ehrlich: Gosh, Cliff we've just covered so much territory here. Listen, if we're going to leave our listener who was wanting to avoid disease and just be as healthy as they can give what we've discussed here today, what would be a couple of tips that you would give our listeners to keep the kitten healthy?

Cliff Harvey: The biggest one that I tell people first up is don't snack. There's no need to snack. We don't need to drip feed nutrients into the system over the day all that kind of stuff. We should eat when we're hungry until we're full. Our plate should be based on a protein first then vegetables and add good quality oils to it. That's basically enough for a meal. If people, then want to eat a little bit of extra carbohydrate that's fine but the take-home message is that natural, whole and unprocessed is the first stop and if that's enough we shouldn't worry too much about other things. I guess the other aspects are we need to move daily, and we want to make sure we're sleeping well.

Dr. Ron Ehrlich: Great. Now listen taking a step back even further from all of this, and this is a final question now. What do you think the biggest challenge is for people, we're all on this journey as either practitioners or patients. What do you think the biggest challenges for people on their health journey through life in our modern world?

Cliff Harvey: I think the biggest challenge is not listening to oneself. The reason I say that is we've lost our ability to respond to what's happening within the body and I think we've lost that ability because we're so stressed, we move so quickly, we're thinking about the next stage rather than just being in the moment. And that's important because it plays into all sorts of things. We talked before about hunger and how we've forgotten what that's like but also, we've actually forgotten what it feels like to be full as well. And we can't feel hunger properly and we can't feel what we actually require unless we actually get full. But those things also require us to step back and be more mindful. If we encourage mindfulness and have a

mindful practice of life we typically tend to go to bed when we need to. We typically tend to respond better to the stressful stuff in our lives. We typically tend to move when we need to. We typically tend to eat when we need to, and we recognise that hunger is just a natural state and it's actually okay.

Dr. Ron Ehrlich: Cliff, thank you so much for joining us today. This has been a fantastic conversation. We're going to have links to your website. I know you've written some fabulous books and we'll have links to those as well. So, thank you so much.

Cliff Harvey: Thanks, Ron. It's been a lot of fun.

Dr. Ron Ehrlich: I love the concept of appropriate. Also starting with macronutrients like fats and proteins. There are some fats that we can't produce so we need to consume foods that have these essential (that's why they're called essential) fatty acids. Proteins are made up of 20 amino acids. Now our bodies can produce some but about nine of those we can't produce so they are called essential as well because we just can't produce them. Notice that there are no carbohydrates that the third category of macronutrients that are essential. So, that word "essential" is also clearly very important. Also, not listening to ourselves, being in the moment, being mindful. Important thoughts for us all, so much great stuff, and so much more to talk with Cliff about.

We're going to have links to his website and all his books. I think they're just terrific. They are so worth the read. So, I hope you've enjoyed that. Until next time, this is Dr. Ron Ehrlich. Be well.