



Diet Doctor Podcast

with Dr. Glen House

Episode 61

Dr. Bret Scher: Welcome back to the Diet Doctor podcast. I'm your host, Dr. Bret Scher. Today I'm joined by Dr. Glen House. Now, Dr. House, as you're going to hear, it's a pretty remarkable guy. He is the medical director at the Capron Neuro and Trauma Rehab Center in Colorado Springs.

He's board certified in physiatry, physical medicine and rehabilitation, which is a specialty of medicine dealing with basically loss of function from brain injury, spinal cord injury, strokes, even Parkinson's, people who have lost function and need the rehab to regain their neuromotor function.

But as you're going to hear, he also is a patient himself. 30 years ago he suffered a terrible accident, spinal cord injury, became a tetraplegic, which you will hear him explain what that means for him. So it puts him in a very unique position to understand his patients better than any other doctor and help his patients. And one aspect that really wasn't getting the attention that he now knows it deserves is nutrition.

And specifically nutrition to impact the metabolic health that deteriorates in spinal cord injury patients over time and nutrition that could potentially, acutely help reduce the amount of inflammation and the amount of damage done from spinal cord injuries. This sounds like a very specific intervention but it really has some broad reaching potential for all neurological conditions. So, it's a really interesting topic to discuss.

So, I hope you enjoy his perspective on this and our discussion on this, because it really could-- It's sort of at the forefront of the research now, but it has the potential to really expand and be pretty dramatic and pretty impactful. So it's an amazing story, he's an amazing individual so I hope you enjoy this interview with Dr. Glen House.

Dr. Glen House, thanks so much for joining me on the Diet Doctor podcast today.

Dr. Glen House: Thank you for having me.

Bret: Yeah, it's my pleasure. It's truly an honor to speak with you. I mean here you are, a physiatrist, sort of at the top of your field as the medical director of Capron Neuro and Trauma Rehab Center in Coronado Springs, you are an entrepreneur with your own medical device company, but it's obviously been a journey to get to this point.

But really your whole story kind of started about 30 years ago when you were skiing and had a severe accident and ended up as a spinal cord patient yourself. So, walk us through that expe-

rience and how, you know-- when someone's life... when your life just changes in an instant like that, what is it like and how do you recover from that?

Glen: So, obviously nothing that anyone plans. I was living life to the fullest, I was 20 years old, I was a junior in college at Texas A&M, studying biomedical science with a plan to go on to actually dental school or, you know, a surgeon... doing some extreme skiing. One Christmas break and I broke my neck.

Left me with a fracture at the seventh vertebrae of my neck. I'm classified as a complete C7 tetraplegic, which is the same as a quadriplegic, just now they use "tetraplegic" for the literature because Greek and Latin line up. So if I use the word "tetraplegia", that's just... means the same. And that's because I have all four limbs involved at some degree. So, I have my deltoids, my biceps, my triceps, but limited hand dexterity.

And then paralyzed basically from the chest down. So that's why... You know, people wonder why I'm pushing around I'm classified as quadriplegic. So, I am the lowest level or the most functional level of a tetraplegic. So, yeah, spinal cord injury, I took obviously a three months off, a semester off, did my rehabilitation at the University of Utah.

And then I went back, did one month of outpatient and went right back to college, finished my degree in biomedical science and actually I switched my plans while I was in rehabilitation. Had my book sent to me while I was there so in between my therapy I would actually study some of the physics and chemistry and getting ready for the MCAT instead of the dental exam. Went back, graduated, got into medical school.

Actually where I chose to go was the University of Washington in Seattle and I believe I was first one to go through in a wheelchair. They were amazing about how they made accommodations for me and really, it was a great experience.

Bret: The way you tell the story, it almost makes it sound like it was no big deal. And obviously it was. And maybe that's my interpretation, but it's remarkable how you were able to go through this devastating life event and have your books shipped to you and do your work and study for the MCAT.

I mean there's so much you need to relearn in life and rehab and adjust, and you were dedicated enough to just pick up your studies and change your career path, but keep moving forward. I mean that's remarkable in and of itself. So I'm sure that experience that you had and your ability to re-build your life so quickly must help you now in your job and dealing with your patients and relating to them and encouraging them to help them build their life up.

Glen: Yeah, I don't want to make it sound like it was too easy. It wasn't. I mean there were those moments where you lose everything... your life is totally changed, you left school, you know, walking across campus, you're going back in a wheelchair... you know, how to adjust how people are looking at you. I mean, all those things were in play.

But also I think I was so focused on what's next, what's now... And in I knew you know... this really sucked. But there's nothing I can do about it, so let's move forward. What do I have to do and how can I continue with life and make it at the fullest. And so, the interesting thing is, I remember very vividly how I felt, how I responded, the thoughts that went through my head.

And it doesn't mean I'm experiencing everything that someone else is experiencing, but at least

I have that reference to be able to have a conversation with them and realize that... you know... we get used to... Oh, is just the next person with spinal cord injury. It's the next person with a stroke. They've lost this function... That's just what we do.

And it's really easy to... they almost just become like... You know, in a factory people come through and it sounds cruel, but I actually have to really stop and think every time... These people, everyone... not just the people who have lost something, but everyone in their family, their friends, I mean, their life has changed, how they are going in a vacation, where they are going to live. Are they going to make it? If they're house-adaptive... How are they going to drive. All of those things. It's pretty overwhelming.

Bret: Yeah.

Glen: Yeah. So, it wasn't easy, but it was easier I think, for me, because I was at a point where I could transition to make that pivot and instead go to medical school. And then I really wanted to study something that... where I could know the most about me and what was going on in my body, in my life. And so, that's why I went into physical medicine rehabilitation; I did my residency at Baylor College of medicine in Houston;

I did a spinal cord injury fellowship at the Kessler Institute in New Jersey so I have a specialty, I'm board-specialized in spinal cord injury also, in addition to rehabilitation or physical measurable rehabilitation. And also, I took an interest in brain injury, so also board certified in brain injury, because we deal with the strokes and the brain injuries and all those conditions.

Bret: Right, so it's not just traumatic injuries, it's stroke, it's multiple sclerosis, it's neurodegenerative disease. I mean, it's all of these things combined, anything that's going to impact function from a neurologic standpoint, so it really is sort of multifaceted. Which is interesting because, the patient population for those, is going to be so different. The patient population for spinal cord injuries is probably going to tend to be younger, the patient population for strokes is going to be older.

So you really are seeing sort of the spectrum, and imagine each person is going to deal with things much differently, and their age, and their family situation, probably plays into that quite a bit, doesn't it?

Glen: Yeah it does, and you are right, so the spinal cord will be the younger, the strokes will be older, but, we just had a 30-year-old stroke patient. I have some older spinal cord, which is even more difficult, you know, because they're dealing with not only just the aging and weakness of that, but now you have to have this spinal cord injury on top of that, with all the other stuff that's already going on with potentially bowel and bladder.

But really, anything that has to do with a functional loss is really kind of what I'm focused on, with a special, special interest in spinal cord injury.

Bret: Yeah, and it seems like there's also maybe two periods of care, there's the acute care, which is probably a lot to do psychologically and seeing how much function they can get back acutely and then getting them back to their life, and sort of the longer term care, which you sort of already alluded to.

Now, a big part of that, is nutrition. How do people eat? But my guess is, and correct me if I'm wrong, that they probably wasn't really taught very much or focused on much at all in your train-

ing. Is that true, or that's just an assumption?

Glen: Yeah, that would be 100% true and there will be zero. I think that may be changing to some degree, but then, the question is "How are we teaching and what is the literature?" And I just remember, basically, we just think, okay, for example, with someone with a spinal cord injury, we just got to feed them, and we got to keep the protein up, we got to keep calories up...

They're losing weight anyways, because they're atrophying, because they are not moving, and therefore you see this weight loss. And so, that's just the approach we take still today.

Bret: Yeah and it brings up a great example that weight loss is not all the same, weight loss is... there are healthy weight loss and so-called unhealthy weight loss. And if you're losing muscle mass, that's not necessarily the weight loss you want to see. But tell us now, walk us through this journey of how you develop an interest in nutrition and specifically how you developed an interest in low-carb nutrition,

Glen: Yeah. So, nutrition really goes back to, for me, for grade school. You know, just being in sports in wrestling, I was always kind of dieting then. I know what it's like, believe it or not, I tell people this and it seems crazy to myself to even think about this, but when I was wrestling... stopped after high school... is that I would actually go three days without eating. I have fasted for three days and that was when I was in grade school, in junior high.

And that's terrible. You shouldn't do that. For these kids that are growing... I mean, I would not recommend that for my kids. But anyways, I know that experiences when people talk about fasting, that first 24 hours, how hard that is, and after that it really is easy for the second or third day. I do know... well, that's life from that time period.

All my life I've always tried to eat healthy family always ate really healthy and had dinner together. And when I got to high school and junior high, I got into weightlifting and bodybuilding and so I really focused on a diet then. I've actually found some of my old diets back from when I wrote them down and watched to high carb load and not carb, and I went almost like keto a little bit when you're cutting in.

So, I always did some of that. But then, the whole low-fat kind of craze came along in the 80s and I went along with that. And so, in med school, I've actually lived alone I had someone just coming in the morning and helped with some things for about an hour, but I would go to the grocery myself and I would basically get lean cuisine and I'll get these low-fat and low-fat dressings and everything taste terrible.

But I did that. And so that's how I lived until right around about, let's say, six years ago. I was kind of following that low-fat diet.

Bret: And recommending it for your patients too?

Glen: Yeah, absolutely yeah, low-fat. Trying to eat as healthy as possible.

Bret: So, what happened six years ago that changed things?

Glen: Well, that was a pretty dramatic change. So, my brother-in-law, who was always on some diet and with success and then not success, really came to me and said, "Would you check out this, this low, basically a higher healthy fat low-carb diet? Because he made a significant dramatic change, And I was like, "How is he keeping this off? I've never seen this happening before and

he's eating pretty good, he's eating a lot."

And so I looked into that and at that point he was kind of-- before the keto was the paleo, that's how it was introduced to me. So I started really studying that and I loved studying the nutrition anyways, and so it was an easy investigation. So, I realized there's definitely some literature here... I think the first thing I start out with, was Gary Taubes's "Good Calories, Bad Calories".

I think everyone kind of dives into that big thick bible with a lot of science to it. And so, I think that's where the journey took me. And then I said: I'm going to actually try this out, but I wanted to know... Based on what I'm seeing, it looks good, but I want to know what the numbers are actually showing.

Bret: Yeah.

Glen: So, there's a key thing here, as how spinal cord injuries... And I can get to that a little bit later if you like, but, spinal cord injuries have certain characteristics that change after spinal cord injury. And particularly mine followed right along with that. Eating as healthy as I possibly could, trying to get exercise when I could, you know, going out and pushing and doing a lot of exercise.

My HDL, and this is the pattern you see in spinal cord injuries, my HDL was extremely low. Like high risk for cardiovascular disease low. My triglycerides were high, also at risk. My LDL was not bad, my cholesterol not that bad... You know, high into normal, but everything was... That HDL and triglycerides were just like a disaster.

Bret: How about your blood sugar? Do you remember like blood sugar, A1c...?

Glen: Yeah, A1c it's always been kind of around that 5.5, 5.4. You know, right around there. So, I've always stayed pretty healthy. I never really checked my blood sugar beyond that, except for when you go in for your annual blood draws and you get your CHEM-7 or your BMP, your basic metabolic profile and you have the glucose there. And it was always normal. It's a fasting glucose.

And that is also characteristic to spinal cord injury. Is that that may be normal, even though you're not necessarily with the HbA1c being even elevated. But, you know, I did that for 16 minutes. So I said, I just kind of got into it and time got away. I don't know why I went 16 minutes. So I started out in the 20s with my HDL. So, you know, you'd like to be in the 40s, 50s and I basically jumped up to, I think it was about low to mid 50s. So, from 20s to 50s, but nothing except for changing my diet.

And my triglycerides dropped significantly to... low. So, now might biomarkers, if you took it to a cardiologist like yourself, and said, what do you think about what I did... Like, I don't know what you did, but just keep doing it. Because if you looked at my HDL, it just shot up, my triglycerides went down, but it was basically just eating healthy high-fat, moderate protein and low carbohydrates.

And when I say low carbohydrates, I initially started out not that low. But around 100 g per day. And then gradually over time I'm kind of shooting them... around more like 60 to 80 was my goal and a kind of did it gradually and I shoot for around 50 g of carbs per day now. That's kind of my goal.

A lot of times just lower. And then, you know, I have my little... My kind of... You know, I kind of call it, the "blow it" meal. It's "blow it" day, but I can't really do a day. It's one meal... Might end up having burrito and those chips and, you know like pizzas... I still do that like once a week just to

keep, you know, that I'm not losing all that... guilty eating.

Bret: It's interesting, so many people... some people for them, that would just set them off on a course that they don't want to be on just a spiral. And some people can bounce back and forth without a problem. So it's nice to see for you that you're in that category.

Glen: Yeah, the one thing about that though is I think why I can easily bounce back is I feel terrible.

Bret: Then why you do it yourself?

Glen: I know that I'm going to feel terrible. I just feel sluggish, I can feel that sugar going up, I can feel that insulin trying to rush that sugar back into my cells and I get it. So, that's an easy transition back to eating healthy.

Bret: That shows how powerful that draw can be, that even though you know you're going to feel terrible, you still want to eat it. It shows the powerful draw for sure. But, let's rewind for a second, you said that sort of the characteristic finding in spinal cord injury patients, that the HDL is very low, the triglycerides are very high... So, why do you think that is? Or what does the science explain that that is?

Glen: This is pretty remarkable. As I also dug into this, I really got into cardiovascular risk in people with spinal cord injuries and it's not just spinal cord injuries. There's also some characteristics of stroke in some people with immobility, but specifically spinal cord injury. As soon as spinal cord injury happens and you're not ambulatory anymore, there is a dramatic loss in... I mean we talked about weight, but a lot of it it's atrophy and muscle atrophy.

And specifically, you get... somewhere in the 45% to about 80% of that cross-sectional area of the muscle it deteriorates. And when you lose that you also get some other characteristics. You get basically an infiltration of more fat in that area so in those muscles. So, you're losing the muscle tissue, you're losing the cross-sectional area, you're getting more fat in there and then throughout the entire body you get this adipose, so this fat throughout the body.

It can be central obesity type of things, which, it had been shown, with this adiposity, this adipose tissue, this fat tissue to secrete more of these cytokines... I'll get into a little more detail, but interleukin six and tumor necrosis factor alpha and that is inflammatory and then it works on the liver.

And then more factors out there are going to lead to vascular inflammation. So, there's been studies actually where they did functional electrical stimulation to those muscles that are paralyzed and they showed an improvement in that insulin resistance. But all people with spinal cord injuries can't be doing functional electrical stimulation with exercise via electrodes all the time. And then, if you stop it goes away.

And so, it's very important that you can control this, you can get that same response with dietary changes. People with spinal cord injuries like myself I can't get my heart rate up to a level that you'd want to get up to be healthy. So, I can't "exercise" myself to health. I have to "eat" myself to health. I mean I really have to focus on that. And for me to be showing insulin resistance, and that's kind of what I was getting at, is that I actually had been doing that recently. I'd been monitoring that.

So this just has just opened up Pandora's box where I've just gone, oh my goodness, oh my goodness. Discovering more, reading more and then looking at myself that I really got into look-

ing at kind of biohacking, biomarkers, watching what I'm doing. So I wear most of the time a continuous glucose monitor. Where I can-- with a little thing stuck in my arm or I can scan with my iPhone and I know where my blood sugars are.

I also follow a lot of my inflammatory markers that aren't the normal things you get when you go to the physician. My homocysteines were high, which is not uncommon for people with spinal cord injury, but the response that people with spinal cord injury like myself... Specifically, that you get to a glucose load or a normal where normally wouldn't be something that threw up your sugar as much without a spinal cord injury does.

So, if I have actually done experiments where I did different things, like I ate grapes and bananas... I mean, grapes for me... I was shocked. It was a quarter of a cup of grapes and my sugar went from fasting, right around say like 85 or 90 to about 160. It was just this ramp up. I did it with bananas, I did it with blueberries and blueberries were the best. Grapes were... just sugar, so that was the last time I had grapes.

Bret: But it's interesting, you sort of have painted the picture of the perfect set up for the insulin resistance and metabolic syndrome, but not something that everybody would think of looking at a patient who is thin. But if their muscles aren't using glucose, because they are paralyzed and atrophied and they are like the extreme of the TOFI, thin on the outside, fat on the inside, because they have the adipose deposits, and then once you get the fat in the muscles, that is the absolute set up for insulin resistance.

But, my guess is that that's not a very common consideration for spinal cord injury patients. And you're probably on the forefront of people talking about this.

Glen: I think there's some really good people out there doing studies, particularly this gentleman who's well known, named Bauman, in the literature. And he has described this quite a bit. I think, in general, the spinal cord population, I think they are still all nervous about going with a low-carb high-fat diet. The recommendation is still low-fat.

Of course, I think, everyone agrees with eat your vegetables, your carbs there, you know, your complex vegetables. You know, I try to not eat more than one for the day, but I think the spinal cord population needs to be focused on this more than anybody. And people with limited ability to move. I mean, just think about my entire body. I mean, literally probably 3/4 of my muscles in my body are not even contracting.

So, they're not there to utilize that, burn and utilize and store that glucose, that glycogen. So, what I normally eat and all you guys that can walk around, you're utilizing that throughout your whole body, I don't have that ability. So, it's easy to understand why that goes up. And it gets worse and worse with time after a spinal cord injury.

Bret: Yes, so I can see how that definitely would be a challenge. Especially if it continues to progress over time. But maybe not everybody's addressing it the way it should be addressed. But talking to a spinal cord injury patient about nutrition, I'd imagine is very challenging in the beginning, because there's so much they need to change. And you can talk about depression and just how much life has changed.

And to talk about nutrition, I'd imagine is pretty challenging. So, do you find you have to have that discussion like later on in their progress or do you still try to have it right away, to get them educated about it? **Glen:** For the younger population, I think you're right. They've lost a lot. And

you're going to take something else away.

I really don't usually address it so much at that point, unless I find out they are insulin resistant already or diabetic. I actually address it a lot with my older population, the people that are coming to me with strokes, and the people that are coming in with other-- And I'm identifying them as new diabetics or you can tell they are insulin resistant on their way anyway.

One of the things I will say when we talk about where is it going with spinal cord injury, I think some amazing research has been done. It's called ICORD.org, it's up in British Columbia. And I spoke with the director... His name is Wolfram Tetzlaff, he is an MD PhD, he's the director of that, and he's done some amazing studies ketogenic diet in spinal cord injury and alternating basically every other day fasting.

So, what he showed, and initially did it in mice, is that, in spinal cord injury, when he gave them a ketogenic diet, you know, high-fat compared to a standard diet, they had a significant improvement of their cervical spinal cord, their motor return of their upper extremity on the ketogenic diet. And basically they are describing that... It's in plenty of places in the literature, describing that ketogenic diet or ketosis as neuro-protective.

So it's actually decreasing the inflammatory effects on the spinal cord. That was followed up... And he had I believe a collaboration at the University of Alabama in Birmingham where they did it actually on patients with spinal cord injuries. So, they did a pilot study and they took individuals and they did some every other day fasting and they also did a high-fat low-carb ketogenic diet with 75% to about 80% fat.

They also identified that they had-- And they looked at their biomarkers also. But they had an improvement in neurological recovery. And that's been expanded, those studies have been expanded. But that's where this should be going. I mean we, in the spinal cord injury population, we should be stopping everything.

I mean, let's just figure this out, let's study this like crazy, let's get some objective data, especially with these patients. You have them kind of in a group, in isolation. It would be very easy to do, to show. And I think that's progressing, that is changing as we speak.

Bret: Yeah, I think that's the most fascinating area of ketogenic diets in neurologic functions in spinal cord injury or strokes. I mean there's the longer-term metabolic dysfunction that we've been talking about, but now you bring up this part and this is what's so fascinating. The anti-inflammatory component of ketones or knowing that the brain can utilize ketones differently than glucose it's the same, true for spinal cords.

You know, hard to know exactly what the mechanism is, but just the fact that a ketogenic diet, like you said, can decrease the amount of injury that occurs to the spinal cord and that's been shown in the brain... So, I think you're right, this deserves a ton of attention. Because, let's face it, there's not a whole lot else that has been used or shown promise really, is there?

Glen: Yeah, that's an interesting thing. We focused... back in the 80s there were some studies where they used methylprednisolone, high-dose steroids. And I remember, I was 19, I had my spinal cord injury, I was lying in bed and on the news that study comes out saying, I do steroids in spinal cord injury... Basically you're going to be cured. And that's how I came across it, of course, on the news.

Bret: Okay.

Glen: Well, as I got further into my medical school and residency and then my internship, that actually came back around and it was published in the Journal of trauma, where it said methyl-prednisolone and an appropriate standard of care.

That was standard of care when someone came in with the spinal cord injury... It is no longer the case. In fact they showed he had more complications, more myopathies, you know, problems with the muscles and different types of infections because of the high dose of steroids and glucose. And so, instead, we were trying everything we could at that point.

We should be trying everything we can, whether it's ketogenesis from a high-fat diet, low-carb diet, whether it's, you know, ketone salts, whether it's every other day fasting. All those things should be looking at, you know, how do we get that ketone level to be neuroprotective. But I think it's difficult because you're talking about these people that were so ingrained to think we got to pump them full of calories on top of that and keep the glucose and get all that up and now are saying, now we're going to basically starve them for a day?

I mean, the whole paradigm shift of thinking about this is a very difficult thing. I mean, can you imagine trying to-- I bet they had a hard time passing that by the IRB, the internal review board, so hats off to them.

Bret: Yeah, that is remarkable how it's a complete 180° turn. I mean, you can see why there could be a difference. High-dose steroids, powerful anti-inflammatory, but high glucose and feeding them whatever you want compared to a potential anti-inflammatory with low glucose and a different type of fuel with ketones and different anti-inflammatory with ketones you can see how that could be totally different and exciting.

And I get that goes along with some of the evidence we have that ketones may benefit cognitive impairment, and Alzheimer's, and Parkinson's, and dramatic brain injury and we don't have randomized controlled trials and throngs of evidence, but we have non controlled studies, we have small pilot studies... There is evidence to show that ketones, either nutritional ketosis or even exogenous ketones, have some neuroprotective benefits.

So, why not study it more? And are you starting to see more people interested? I mean you've mentioned two, one in British Columbia and one in Alabama. Are there more universities doing trials on this that you are aware of?

Glen: I'm not aware of everything that is going on right now. I know they're expanding this study that they're doing there. I don't know how far they are along that. I mean I did look at that recently and they were enrolling. So, I'm very excited about what the future is. I think this is clearly... There's clearly enough data to say there's the benefit of it.

I think there's two ways to look at this also. It's acutely... So, it's acute spinal cord injury, acute brain injury, acute stroke... All those acute injuries... to be neuroprotective and have less damage and stop that cascade that happens of the inflammation. All those cytotoxins that are coming in damaging. So you have the damage itself.

You have the blood damage or the lack of blood supply, whatever that damage is and then what really damages things is all the inflammatory markers, the inflammatory cytokines and all these things that come in, because when they see damage or bringing in stuff that is damaging further.

That's where ketosis and that neuro protective and anti-inflammatory effect to stop that cascade happens. Then, I think, the second part of that is longevity. So my whole focus right now-- Right now I'm 51. When I turned 50, I think things really changed to where it's like, I got to start really focusing. And I had before, but I'm really focused on longevity on spinal cord injury and what do we need to do and what are those things that-- You know, there's a lot of factors that go into that.

But it is pretty well known that right about the 20 year mark, something seems to change in the spinal cord injury to where more and more problems happen. And we also know, and I'm not saying that this is exactly related, but there probably is a lot to be related, is that after a duration in spinal cord injury this insulin resistant component gets worse and worse and worse. And I was just shocked when this was happening to myself.

We have no family history, no one with insulin resistance or any diabetes. And here I am, I'm probably eating and acting as healthy as I can, and I'm starting to see that if I wouldn't have intervened. So I did and I'm trying to be proactive about longevity. I also did my calcium arteries score and it was zero.

So, I think whatever I've been doing for the last six or seven years with this high-fat diet, leaves my... At least has left my cardiovascular score as good as it can get. But that wouldn't make sense because now my HDL is low... my HDL is high... My triglycerides are low. So, you know, I'm eating the healthy diet where my markers are great.

Bret: So, knowing what you know now, is there any question in your mind if you knew then what you know now, would you have started a keto diet day one after your spinal cord injury?

Glen: Oh yes, absolutely. And here's the other thing. It tastes great. I mean I really, really... Whenever the science leads me, I'll follow. I mean, if they come out tomorrow and it is slam dunk, there's no question that this certain kind of bread is the healthiest thing in the world, I'll just order it by truckload. But that's not the case. And here's the great thing about the ketogenic diet or higher fat low-carb is that it tastes phenomenal.

So, putting away those salad dressings that say no fat with a lot of high sugar and then bringing in this high-fat taste... Just the other day I had a big old salad, just dumping the salad dressing in there or olive oil and it just tastes fantastic. And the recipes on Diet Doctor are just unbelievable. I mean just looking at that website... mouth starts watering just looking at some of that stuff.

It's really good to be able to-- And just let me say that too, as I basically have somebody that I wanted to talk about, what are they going to do? How are they going to intervene? I would say, read this book... But you know that's not going to happen, right? But now I can say, look, you go to this website and then I want you to come back and I want you to report to me and we want to talk about it.

And I want to look at your numbers. And that's how I guide them through that. And I say, I want you to intervene, I want you to start looking at that. And I don't go right to 20 g of carb. I kind of gradually get them down. That's just how I do it. But I want to try to get them around if they're not type 1 diabetics. I know people are, but I'm not comfortable with that, but if someone is insulin resistant or has type 2 diabetes, I clearly start doing that. And I even do it in the hospital. When people come in, I'll start changing their diet.

Like the diet that they get in the hospital-- and this is throughout the United States-- the diet that they get in the hospital, you almost have to get out of the hospital to really be kind of healthy. I

mean their sugars are going up because they are allowed 60 carbs. It doesn't matter what they're eating, they can have toast as long as they're staying under 60 carbs per meal. And then they get a snack or... another 10. And that's the type 2 diabetic.

And I started saying, we're just going to go to 30 carbs a meal. Where before they had 100. And it is unbelievable how their insulin starts going down because they are usually on like metformin and on insulin sliding scale or maybe on some Lantus, a lot of time we are able to completely get rid of Lantus. And then usually they don't even need the sliding-scale and the metformin is doing it alone, their diet is controlled, they feel better. That's rewarding. That's a fast turnaround.

Bret: Yes, and again the opposite of what usually happens. I mean that's impressive that you can have the type of effect on someone who's hospitalized and maybe not even in the mental position to really address their diet.

But I see it so often that people come into the hospital either not on insulin or on a certain dose of insulin and they leave on insulin or on a higher dose of insulin, because they've been fed so much glucose and sugar and say, we can just control that with more insulin. It's just such backwards thinking and fortunately I think is starting to wear away a little bit and people are starting to see.

But I'd imagine in your field where maybe people aren't as concerned about nutrition, are you starting to get pushback? Or people are starting to think like, what is this guy doing? And kind of thinking you're doing it the wrong way?

Glen: Yeah, I did initially. But I think people have seen the results. And I know that like you mentioned, when they come to the hospital for various reasons, I mean, maybe they can't eat, so they can't-- But most people, a lot of times, they're just take them off their orals or they don't have that particular oral medication, so they put them on insulin.

They come to me and I try to figure out where this should be. There's a lot of our therapists that work in the rehab unit. A lot of our therapists are actually keto or low-carb, so I have my chance-- in fact I have a little baggy there or some keto cream. One of the speech therapists just told me... He said, try this. So I think that's nice camaraderie. Also this particular speech therapist had seen a lot of people with neuro-degenerative problems or cognitive problems embracing that and helping explore that.

Yeah, I did get some initial pushback from one of the diabetes educators when I tried to take people to 30 from 60 and saying you cannot reverse type 2 diabetes or you can't improve it. And so... But now, we have a new one, so she's open to my-- I said that with all the nutritionists and dietitians and diabetes educators. I said, here is my bias... And I tell people my bias when I start.

So, I say, you're going to hear different things from different people but I want you to educate yourself. So, I think that's really important. Because they don't have all the answers, I don't have the diet that everyone needs to follow. I think it's always individualized.

Bret: Right, and that's a great point. I think one of the reasons we talk so much about low-carb diets and keto diets is because no one else is talking about them. Or in certain situations or even being told to specifically avoid them and that's why I think it's so important to talk about them. But you're absolutely right that there isn't one diet for everybody and that might not work for everybody.

Although if it was the one intervention that showed reduction in spinal cord injury or stroke volume of brain and tissue involved, that would be a different story. Then you're talking about a medical intervention. So, that would be very interesting to see data about that.

Glen: I don't know of any other studies that show this particular diet intervention cause this neuroprotection and improved outcome. So I didn't say that. I'm not aware of any other diet that did that.

Bret: Yeah. Now, getting back to your personal story a little bit, because, you know, 30 years later doesn't sound like it's slowed you down much. I've heard stories about how you're still skiing in your wheelchair and your friends, you are climbing 14,000 foot peaks... So, I'm curious, what have you noticed about your performance athletically and physically since you've altered your diet?

Glen: I think that's an important thing I need to talk about. So, there's one thing that I did race, mainly for brain injury. That's something called the Pikes Peak challenge. So, it's basically climbing Pikes Peak in Colorado Springs. We start at 13 miles down from the top and we climbed about 7000 feet during that time.

I used a particular push wheel. So it's like, thinking about this, if you were to climb that big of a mountain with a one-speed versus a mountain bike, it would be almost impossible with the one-speed. But with the mountain bike you're still pedaling, it's still hard, but you could more easily do it. So, that's kind of an analogy of what I was using, the technology. I used my same chair, just some different wheels.

So, I've done it six times. I did it last year when I turned 50, because there were a lot of reasons why I wanted to do it. I was never going to do it. I told my wife I think three times I was never going to do it again. And I really am sure this time. But it took about eight hours in the past. And I always glucose load. So, I train all summer, and then I get those packets go to REI and I've got all those little glucose packets and squirt them in.

And you just go, go, go and then crash, crash, crash. Go, go, go, crash, crash, crash. And so, that's what I did all those years. And it took eight hours, I'd have to stop, we'd have to take breaks. And then I turned 50, I'm like, okay I got this new kind of Yamaha wheels. That's cool. I've just turned 50 and I want to do it in ketosis.

And so I really explored that. I learned a lot from the book... The Art And Science Of Low-Carb Performance. I think there's eating and then there's performance. Or lifestyle and then there's performance. But I looked at performance. I learned as much as I possibly could.

I reached out to as many people as I could and I watched the movie on Diet Doctor where those two... a married couple that rowed like from California to Hawaii and they did it in ketosis. And I was encouraged by that. Although I can tell exactly what they're eating. So, I really researched this and I trained in ketosis. So, I didn't just say I'm just going to be ketotic and go.

So, I trained all summer in ketosis and the endurance was unbelievable. Normally I'd be going around and might come in exhausted. Then, the first time I even went out and did my training, loop up some hills, I came in and I said, I feel great. And it was shocking. So I did it. And my daughters went with me and we would stop every mile, just enough-- Almost every mile.

But every mile to check my oxygen saturation, my heart rate, my glucose and my ketones. So, I had kind of a pitstop and one daughter would be checking vitals and the other checking... that.

And I had my hands all wrapped up... Just massive tape and everything and gloves... And skin was off my hand when I got to the top but I knocked two hours of my time.

Bret: Two hours.

Glen: I was always in ketosis the entire time. I started out at 1.1, ketones at 1.1. I was always in that range of probably around 0.8 to 1.4 while I was going up. I never stopped, except for those short breaks to check that. I did a kind of a keto shake load in the morning. Some high-fat and cream, you know, just mixed in a shake. The shakes I actually drank on the way up.

I had some nuts... You know, I fat loaded instead of carb loaded. I fat loaded the whole way and it was unbelievable. The next day I was usually just dead. I felt like I hadn't done anything. It was just amazing the endurance. When your body's keto adapted... So, I'm used to burning fatty acids as my fuel and it's super-efficient.

Bret: That's a remarkable story. Wanting improvements. So, I think it's clear as we both said that there's no one diet for everybody. But I think it's clear you found the right diet for you from a taste standpoint, a metabolic standpoint, a performance standpoint. You're definitely hitting it on all points there, so, that's fantastic.

And being an advocate for the diet with your patients to help them in the right ways, both acutely and chronically, and now talking about the research that's happening and hopefully we'll be seeing more of down the road. So, thank you so much for joining us and sharing your story. Any last words, so, anything else you want to live our listeners with on this topic?

Glen: No... well, the last thing is... I appreciate you what you're doing and Diet Doctor, and the website, and the resources you have. I really enjoyed all the as you had on there. But it's a great resource, I mean it's doing a lot for the health and longevity of our patients and no one else was doing it. So, I really appreciate the... Well, the opportunity to do this and tell my story and how I use it... And also for what you guys do.

Bret: Well, thank you. And you are definitely an inspiration. And how you lead by example and so many aspects of your life. So, thank you and keep up the great work.

Glen: Thank you very much

