

Paleo Solution - 287

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Robb Wolf:

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Hi, folks. Robb Wolf here, another edition of the Paleo Solution podcast. I'm very excited for today's guest. Amy Berger is one of the most prolific commenters on the RobbWolf.com site in addition to that, she has a master's degree on human nutrition. She is a nutritional therapy practitioner. She is the author of *The Alzheimer's Antidote* and she also has one of the coolest blogs and blog titles, Tuit Nutrition.

Amy, how are you doing?

Amy Berger:

I am great, Robb. If you think you're excited, you got nothing on me.

Robb Wolf:

Cool.

Amy Berger:

I have to say it's like talking to Bruce Springsteen and Bon Jovi and U2 all rolled into one and that's how big a rock star you are to me and it's probably true with a lot of your listeners too.

Robb Wolf: Thank you. I'm very honored. If that is the case, then we really raise your standards for rock star but thank you very, very much. So you just got back from doing a little bit work on the farm? What have you been up to with that?

Amy Berger: I did. Like we were saying before we started rolling. I quit the government day job a couple of weeks ago and a local farm Brandywine, Maryland was short staffed and I know the farm managers and they kind of asked if I can just step in for two weeks and I've gotten my hands dirty. I have helped butcher and process some chickens and I'll tell you what if anyone out there does not understand why the good food cost what it does, I encourage you to spend a couple of days on a farm and you will never wonder again.

Robb Wolf: Yeah, yeah. Absolutely. I just got back from a Polyface Farms gig. It's people and labor intensive to make the food good quality and to provide the best habitat you can for the animals that are living in that environment so it's a very different feel, very different scenario than the CAFO models.

Amy Berger: It is. There're no days off. There's no vacation when you're a famer. Something is always breaking. Some animal needs to be fed. It's just absolutely nonstop.

Robb Wolf: Yeah, yeah. So Amy tell folks about your background. You have a pretty interesting background. You've been in the military. You pursued a quite a lot of work in the understanding of human nutrition. Tell folks more about yourself.

Amy Berger: Well yeah first I mean before I forget I want to say because I was in the military. I was just a little short, four years in the Air Force. And I want to thank you personally for the work that you do for the Special Forces community and the whole military and you and Kirk Parsley and also Dominic D'Agostino, all of you guys that are doing what you for the military. I just thank you personally and on behalf of all the veterans and military folks out there. So yeah, I was in the military but that wasn't really kind of the life for me and I ended up getting my masters in nutrition and like so many people I guess the way I came to it was I was kind of chubby all my life and I was chubby despite doing low cal, low fat, lots and lots of exercise. I've run to marathons. I wasn't lazy. I wasn't sitting on the coach eating bonbons all day and watching television. So something finally forced me to question why I was still chubby, why was I still inflamed. I don't even know how I stumbled upon it. I think I got a hold of the Atkins book one day and learned about low carb and a couple

of light bulbs went off and it just made sense to me and from then on I kind of just read everything I can get my hands on.

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Robb Wolf: Awesome. So clearly you know I've been trying to unravel some of my own health issues, 15 years of this and tweaking and fiddling and I definitely notice that I do better a little bit more on the lower carb side of things. There've been lots of swings in the pendulum from super low carb to drown yourself in potatoes. Where are you at on that spectrum? Like where's your kind of optimal fueling and best cognition and best physical performance?

Amy Berger: I would say my--other than tending toward extra pounds on my body, thank god, I don't really have any major health issues. I don't have anything digestive going on. There's nothing autoimmune that I'm aware of anyway. So for me, it's really managing my weight and then I would say the best benefit of me when I'm very low carb is my mood. I tend to be far more optimistic and glass half full than I normally am. I'm naturally very pessimistic and that kind of goes by the weight side when I'm in a nice good keto state. But my body comp seems to like slightly more carbs, not a ton but slightly more. I can actually handle some protein shakes post workout, maybe a little bit of fruit. So it's kind of like you, it's a balancing act and it's not cool because it is a balancing act and it's not that you can be a 100% one way and your body comp is good, your brain is good, your mood is good. You kind of have to be somewhere in between and constantly modulating all the different levers at the same time.

Robb Wolf: Yeah. I have a really sharp young guy, Raf, we have a lot of Twitter discussions back and forth. We haven't been able to talk more extensively than that.

Amy Berger: He's the one that posts lots of pictures of bone marrow and all kinds of--

Robb Wolf: Yes. Yeah, yeah. Great guy and he is all over me. He just calls complete bullshit that my best physical performance isn't also the thing that best cognitive performance. My best cognitive performance is deep ketosis. I can motor along to in jujitsu but I just don't have that low gear and so I've been trying to figure out kind of the middle ground between that. I've talked to like Grace Liu and some other folks that we're suspecting maybe some gut dysbiosis and so I'm doing new biome and all this stuff trying to figure that out but it's interesting. It's definitely an onion that never finishes getting peeled. So you had some exposure in all this initially from kind of

Atkins low carb diet. How did paleo and Weston Price and all that stuff get on your radar?

Amy Berger: The paleo, I actually think your blog was one of the ones I found first and it was a long, long time ago. You had kind of, no offense, but this stinky little site. You know what I'm talking about. It was a long time ago.

Robb Wolf: Right, right. Yeah.

Amy Berger: And now you have all the bells and whistles. But when I was learning about paleo it was a shift to more of food quality rather than because you can do a low carb diet any garbage and you'll lose weight and you may also get fairly healthy just from reducing insulin, reducing glucose and all that. But there might be a lot of other issues that don't go away until you get rid of let's say soy protein and low carb bar and shakes, things that you can on a low carb diet that aren't necessarily the healthiest things.

Robb Wolf: Right.

Amy Berger: And I think--I just started getting more interested in the proper animal husbandry aspect of it too. I worked on a very small farm in "Nowheresville" Pennsylvania a couple of years ago and that was my first introduction to how this was really done, chickens out on the grass and pigs eating whatever they can find. I know you know paleo and Weston Price has this sort of battle going on but overall, we have so much more in common than we disagree about. And I think the Weston Price Foundation also opened my eyes to a lot of these issues about alternative health and raising animals and growing produce the right way and there's so much more to the picture than just the food, you know?

Robb Wolf: Right.

Amy Berger: When we were talking before about low carb versus slightly higher carb for cognition or body comp, it's--I did six months in Iraq and when I was there, I was there I was in the best shape of my life and I was eating low carb but I was absolutely nowhere near ketogenic and of course not a grass fed steak in sight. I mean everything was probably coming from the mass companies. I won't name names. But these companies have produced massive amounts of food and yet I felt fantastic, I looked fantastic and I think it's because my routine was different too. I loved my work. I loved the people I worked with. I work a shift from noon to midnight which is sort of in tune my natural circadian rhythm and I think that helped. I think the diet was the foundation but just the fact that all

the pieces of my life had come together in a way that worked for me meant that I had a lot more flexibility with my diet and I can still look and feel fantastic.

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Robb Wolf: Nice. Amy, there's a lot of debate in paleo low carb land whether or not women do more poorly on ketogenic type diets. There seems to be some leaning towards that. Why do think you're maybe a little different in that regard or what are your thoughts on that, women not doing as well on ketogenic diets?

Amy Berger: Yeah. I have to say I mean for me personally I've never done a full, full keto for the very long term. I would say I'm much more low carb than I am ketogenic. So that's the first thing. And I think I agree with a lot of other people who think it maybe a caloric intake issue that you just aren't hungry enough to eat enough food and I think another issue that I don't think gets enough play is protein. I think women especially don't eat enough protein. You know they think, even on a ketogenic diet, they're still afraid of red meat. They think a little 3 ounce of chicken breast is enough for dinner and it's not especially if they're doing CrossFit, if they're doing some kind of intense exercise, I think they need more food. You know that doesn't have to be bread. It doesn't have to be potatoes but you can eat--I just think they're not eating enough protein. I really do.

Robb Wolf: Interesting. Because one of the common problems with ketogenic diet is folks can look it like the paleo template which is pretty high protein and so they maybe start migrating too high in protein but you're kind of thinking that for women in particular, they maybe are just under eating in general and under eating protein. That's interesting.

Amy Berger: I think so. I think there's even within the paleo world, women, they think 1200 to 1300 calories is enough and I don't know and I think maybe some--there's so many great things about fasting and everybody wants to fast now but you know fasting is not for everybody.

Robb Wolf: Right, right.

Amy Berger: I get a lot of clients that are hypoglycemic and I don't think that those people are the best candidates for fasting.

Robb Wolf: Shocker. Yeah, yeah.

Amy Berger: Yeah. And I find too, a lot of times when people crave sugar what they're body's really asking for is protein.

Robb Wolf: Interesting. Okay, okay.

Amy Berger: I know for me when I get a sugar crave, sometimes I indulge it but sometimes I say okay I'm hungry enough for something else. Let me have a can of tuna, let me have a can of sardines and 9 times out of ten, I'm not interested in sugar by the time I'm done eating that.

Robb Wolf: Nice, nice. Interesting. So Amy, what areas have you been particularly interested in as you've gone through your clinical practice and I'm kind of stirring this towards the Alzheimer's Antidote but I mean what were your first focused on when you got into your kind of clinical practice and how is that grown over time and how or why did that grow into an interest in Alzheimer's disease.

Amy Berger: Coming from the background I did, I really just wanted to focus on weight loss because there's so many people out there struggling so hard the way I did for so many years and I told myself if I could save one person from falling into that hole, it would be worth it and I would consider myself professional success.

Robb Wolf: Right.

Amy Berger: If I could save one person especially maybe a younger girl, the self-esteem nightmare that I put myself through. All those years of struggle and why can't I fit into this dress and how come everyone else is thinner than me and they do is eat and they never workout. Well I wanted to try to help educate people about the way the body works. Because when you understand the actual physiology and the actual biochemistry, then eating butter is not scary and eating steak is not scary. You know that phrase if I knew then what I know now.

Robb Wolf: Right, right.

Amy Berger: How much mental torture and psychological suffering would I saved myself. I don't mean to sound like a religious fanatic or anything but I would love to spare people that. I haven't been in practice all that long but the weight loss is part of it. I get a lot of women that are just struggling with energy levels. They're struggling with outlook. There's a whole lot of things and definitely the weight loss is it's actually the most difficult thing because I find that people when they change their diet,

they start feeling better but the weight still doesn't budge. And I think maybe there's actually almost too much focus on weight altogether.

[0:15:11]

Robb Wolf: Right, right. I did a blog post, a paleo diet, am I losing enough weight and I really tried to look at that and actually redirect it and say are you doing before and after photos, are you doing measurements, do you have a performance goal, are you sleeping enough and those things should really be the driver and then the weight will really take care of itself in that process but that's a tough sell for some people like they're really focused on that scale change.

Amy Berger: Yeah. And especially I've been getting some postmenopausal women and it is so difficult for them to lose weight. They feel like failures when they're sticking with the diet, they're doing everything right, but it just sometimes those cases take a lot more tweaking and just a lot more specific changes rather just the diet. It's so difficult. You know especially having spent some time on a farm being thin is not all it's cracked up to be. You want to have some meat on your bones. If you're going to do some work, if you're going to be robust well into old age, it's not that you need to be fat. It's not that you need to be overweight with a high body fat percentage. But you need to have some meat on your frame. You know I think there's this obsession with just being thin, you miss the boat on body composition especially among women.

Robb Wolf: Right, right. John Berardi did a nice piece recently on the kind of the cost benefit of abs whether male or female and really made a pretty strong point that unless that happens to--that magic fairy just visit upon you somewhat miraculously then it's probably not your best option to be shooting for super lean abs in particularly all the time.

Amy Berger: Right, right. I mean are we even meant to see our abs year round.

Robb Wolf: Right.

Amy Berger: Year in and year out. And I just you know maybe this is a little woo-woo, a little out there but sometimes I think how much human creative potential is lost to people just feeling miserable about the size of their jeans.

Robb Wolf: Right.

Amy Berger: I mean if we can just get over it. And instead of sitting around, feeling sorry for ourselves and feeling self conscious just get up and go write that

novel or pick up that guitar or whatever the thing is that you've been putting off until X number of pounds come off, just go do it now.

Robb Wolf: Right, right.

Amy Berger: And maybe the weight will come off because guess what? You're going to be happier. You're going to feel good and your hormonal profile might shift.

Robb Wolf: I completely agree. You start feeding some of the more soul enriching elements of your life then you tend to sleep better and you have lower stress and all that type of stuff which all clearly leads into good body composition, good hormonal profile and all that type of stuff. How did a background looking at weight loss, how did that transition into an interesting Alzheimer's disease?

Amy Berger: It all came out of learning about low carb. Gary Taubes' *Good Calories, Bad Calories* was the first place I ever read about a connection between insulin and Alzheimer's. I think he's got a chapter in that book. I think it's called cancer, dementia and aging or something like that. it's one of the chapters. And I read it and I was kind of like wow that's fascinating but I have no family history of Alzheimer's so it wasn't that interesting to me at the time but I sort of filed it away as something I wanted to look into later and then it was several years later when I was getting my degree in nutrition and I had to pick a thesis topic. I was trying to think of something that would interest me enough that I could write a thesis on it, what do I find interesting enough, what hasn't been done a million times, what could I really learn about. And I said I'm going to go back to that Alzheimer's thing and see if I can find enough research that I think could get a couple of pages on this and when I started looking at PubMed, I could not believe how much research was out there. And when I found that and this whole type 3 diabetes thing, diabetes in the brain, I said I have to write this because how is it that I know what I know about low carb and I've never heard of this before and how is this all over the medical literature and nobody is talking about it.

Robb Wolf: And you know what so many layers of this so interesting to me. Not only are people not talking about it but there's no effective movement towards prevention or treatment until very, very recently. Your book, David Perlmutter and a few other folks really connecting some dots and saying hey I think we can actually do something about this. I remember there was a--Oh, man. There was news piece where some folks were just adding coconut oil to standard meals and producing some physiologically

significant levels of ketones and the Alzheimer's symptoms were markedly improved and these people are doing great with that.

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It's really interesting like they say that science and medicine, we kind of get into silos and we definitely do and I think in general there's still a lot of--it's interesting I think we can make an argument that humans should normally be able to eat a decent amount of carbs and not suffer deleterious effects but for whatever reason whether it's gut biome or sleep or what have you, we have some inflammation or insulin resistance, cooking such that the normal levels of dietary carbohydrates that people are eating are becoming problematic and we need to do something to kind of turn that boat around. I know there's some controversy out there about--Some people will say that even ancestral level of paleo type carbs can be problematic from neurological health. I have some thoughts on that but what are your thoughts on that?

Amy Berger:

Well I mean I could not agree more with what you've said. I think most people born at least of a healthy mother which is a whole other topic but most of us probably enter life with a decent carbohydrate tolerance and decent insulin handling. But over the years whether it's the way we eat when we're kids or over the decade how much we sleep stress, everything plays into it, eventually I think some people do reach a point where they are, I hate to use this phrase but I'll just use it, broken. There are people whose metabolisms are no longer able to handle something they might have been able to handle 30 years earlier. And then of course some of us are born compromised whether it's from the mother's diet and at our exposure, even stress hormones and things in utero. I mean all of that predisposes us to issues to childhood and all our lives. So I think depending on activity levels, depending on sleep, depending on a lot of other things, I don't think pineapple and potatoes, they're not poison. I mean come on. I am definitely not a low carb zealot. I think most people can probably handle those foods. But when you are already experiencing problems, if you are already diabetic, if you are already showing cognitive impairment, if you're already obese, you know maybe plantains aren't the best thing for you. At least give a trial to cutting that stuff out and see what happens. Your audience, you have a lot of young very fit people and for them, I would definitely not scare anyone off of fruit and tubers and even grains if they tolerate them. I don't think people just don't appreciate how individualized this stuff is. Everybody gets in such a tizzy when there's an article about ketogenic diet for XY condition but more carbs for A and B condition like that's okay. There's allowed to be differences. So I think there is a role for carbohydrates in the diet even on

a very low carb or ketogenic diet. I think raspberries like this is not a zero carb approach but certainly someone whose brain is starving to death, they do not need to be eating lots and lots of cereal.

Robb Wolf:

Now that's something I'd love for you to go into a little bit that is really I think very counterintuitive and something that folks don't understand so with Alzheimer's disease, we call it type 3 diabetes, it's insulin resistance of the brain. We get these beta amyloid plaques that are built up and really a horrible neurodegenerative kind of cascade that occurs in that whole story. But the really interesting thing is a lot of what's going is like you just said the brain is actually starving for a fuel substrate. How is that possible like these people are swimming in nutrition, they're maybe overweight, they have high blood glucose levels. How is the brain starving in that scenario?

Amy Berger:

Good question. It's kind of funny, we do call it type 3 diabetes but the thing with Alzheimer's is you can have a normal fasting blood glucose and you can even have a normal A1c. The reason those things will stay normal is because insulin is so freaking sky high. They would generally diagnose type 2 diabetes or even type 1 sometimes with a hyperglycemia but an Alzheimer's patient might not be hyperglycemic but it's because of the insulin. But with Alzheimer's, it seems to be the hyperinsulinemia that's actually more problematic than the glucose. But regardless, the brain loses the ability to use that glucose as well as it maybe did when this person was younger.

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So even though there's a ton--it's just like being a type 2 diabetic even though there's a ton of fuel in the body, in the brain, the cells on a cellular level are not able to access it and use it. So the brain thinks it's starving to death. And what are these neurons do? I don't know if-- hopefully the listeners kind of know what a neuron looks like. If not, they can use Dr. Google. You know it's like this little cell but it's got all these projections. These axons and dendrites, these long projections and that's how the neurons communicate with each other. They send out signals through these projections. And when the cell starts losing the ability to burn energy, the cell doesn't immediately die. What it does is it shrinks these axons and dendrites in order to conserve energy to keep the rest of the body of the cell alive. Well I tell people it's like sucking in the cord on a vacuum with a retractable cord. The cell will suck that axon back in and guess what? You just lost the connection between that neuron and the next one. So these neurons are no longer talking to each other and obvious result of that is going to be memory loss, problems with

behavior, impulse control because your brain is literally not--the cells are not talking to each other. So yeah there's a ton of fuel around and like everybody knows on a typical diet, glucose is the main fuel for the brain and even on a ketogenic diet, the brain still needs some glucose of course. It does need glucose. But the problem with this comes when somebody's on a typical American diet with 50 to 65% of energy coming from carbs. There's all this fuel but the brain is still starving. The only way for these brain cells to start getting fed is to give them something else but they can't use something else unless we make a hormonal and metabolic shift in the whole body and that's only going to come by keeping carbs low enough to flip that switch to start generating ketones.

Robb Wolf: So have you tankard much with--So is your approach specifically geared towards more of a dietary like a nutritional ketogenic approach or are you still letting in 50 to 100 grams of carbs a day ideally good sources but then supplementing with like a coconut oil MCT and what not or do you use both of those approaches? Do you have a favor one way or the other?

Amy Berger: Well to be honest, there aren't too many people taking me up on this yet. I wish there were. Hopefully this podcast will be a way to get this information to the masses but what I recommend in the book and what I recommend people try is start with under 50 grams if you can and sort of use coconut oil as liberally as you want to whether its coconut oil or full fat coconut milk. I wrote a big sort of rant on my blog, a 3 part rant on the exogenous ketones because I think they can be fantastic as adjuncts to this. If we start using them as medication like oh just go eat your regular old diet, don't change anything about your diet or lifestyle that may have actually cause this to happen in the first place. No, don't--just eat whatever you want, just do whatever you want but take these ketones. Well what's going to happen is that underlying problem of the insulin resistance and the hyperinsulinemia just gets worse and worse so even though somebody might have an improvement in our cognitive function from these outside ketones, over time they're going to continue to get worse and they either need more and more of these ketones and they will need them more frequently or it just--I think they serve a role but I think they have to be only one small part of a strategy and that diet should be the major foundation of the strategy. The exogenous ketones are like putting a Hello Kitty Band-Aid on a sucking chest wound. Let's see how much bleeding we stop with that.

Robb Wolf: Better than nothing but not really addressing the problem.

Amy Berger: Exactly better than nothing but definitely not the most important place to start. I mean I totally understand if I were a caregiver or if I were the spouse or the child of someone who was really debilitated and demented with this condition, yes, I would absolutely try to get my hands on some ketones. But I would not make that my only intervention.

Robb Wolf: I totally agree and some of the research and the anecdote around just take whatever your eating and then throw coconut oil and MCT oil on top of it is that we usually see some immediate improvements and then two three years down the road, the improvements are all but gone and then we see normal disease progression, morbidity, ultimately mortality. And I've really been wondering hey if we attack the underlying cause here, would we see a different disease progression and I don't know that we definitely have an answer on that but I think we've got a pretty good argument.

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And to your point like if somebody is dealing with someone who's pretty demented, really labor intensive day to day care, getting in some coconut oil MCTs by hook or by crook, we might get that person to a point of maintenance where then we endeavor to get those carbohydrate loads down and get endogenous ketone production ramped up which is implying that we also really address the insulin resistance story.

Amy Berger: Exactly, exactly. I mean there are some studies now where they've done a multipronged intervention. It was carbohydrate reduction. I don't think it was in the study of the exact degree of restriction but it was a lower carbohydrate diet plus some MCTs. They were getting vitamin D replete. I think getting zinc replete, omega-3, stress reduction, more sleep and a minimum of 12 hours between dinner one evening and breakfast the next morning so kind of like a mini fast. It's the Bredesen study. It's actually pretty famous. The guy's name is Dale Bredesen. If anyone wants to Google it, it's B-R-E-D-E-S-E-N. It was a pretty short-term study but he's already I think conducting some long term studies. But they reversed cognitive decline. They even reversed full blown diagnosed Alzheimer's disease. There were some of these people had to quit their jobs and they are now back at work.

I mean it was not effective and that wasn't even I don't think a full-on ketogenic diet. So and I think I'm sure you've heard of Mary Newport. She's the one with husband...

Robb Wolf: Yup.

Amy Berger: Yeah. Her husband has Alzheimers and like you were saying, some people noticed some progress just adding coconut oil to their diet doing nothing else. When she first found out about all this, all she did was put coconut oil on his oatmeal for crying out loud and she noticed an improvement. So imagine the kind of improvement we could get when we dose a lot of MCT and combine it with all the other interventions that we either know or have good reason to suspect can reverse or improve hyperinsulinemia.

Robb Wolf: Right.

Amy Berger: And it's nonresistance.

Robb Wolf: Right.

Amy Berger: I just – this stuff is all over the medical literature and it's just not trickling down to the average doctor's office and not even to the neurologists and I had to write this because of like this. This is here. This is – the people in the lab both know about this. The people reading the PET scans, the people doing the brain dissections post mortem, they will first think type 2 diabetes insulin, insulin and how come that's not getting out to the laypeople. It's not really controversial. I think it's controversial as to what is actually the fundamental cause and whether or not this type of intervention will be effective for everybody, but it's not controversial at all that this is a glucose and insulin problem in the brain.

Robb Wolf: Right, right, which then implies and people get really wrapped around the axel of its insulin resistance, the carbohydrate hypothesis, the excessive calorie hypothesis and to me, it really doesn't matter at the end of the day once you become insulin resistant, even the folks that are very, very much in the camp of the calories in calories out hypothesis which I – folks Stephan Guyenet, that I think make a very strong case for that. There's still a reality that if we're then broken and our insulin signaling and glucose disposal are compromised, then reduce glycemic load and we're going to have some good benefits there. We definitely from a clinical output perspective, we can hang our cat hats on that all day long.

Amy Berger: Exactly. I mean it's a very different animal when we're talking about someone who's healthy and someone who has good blood glucose management versus someone who is already way off the deep end of health.

Robb Wolf: Right.

Amy Berger: In a bad way.

Robb Wolf: Right.

Amy Berger: What's appropriate for a 22-year-old guy who runs 3 miles a day and lifts and is a specimen of perfect health, it's totally different from what might be appropriate for someone who is 65 and loses his keys everyday and lashes out and is starting to show signs of Alzheimer's. I think it's really not that different from what may be going on with cancer and I have to thank you personally because you're the one that introduced me and pretty much the world to Dr. Seyfried's work because there's so much new research coming out with Alzheimer's that there's the amyloid hypothesis and now, there's actually a mitochondrial hypothesis that seems to fit a lot more of the evidence and a lot more of the data a little better than just say oh it's these plaques. These plaques are causing everything. Well, what's causing the plaques. Something is fundamentally going wrong with the cellular metabolism and that's going to be the mitochondria.

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Robb Wolf: And they've done everything under the sun to try to mitigate these plaques and it does nothing for disease progression.

Amy Berger: Exactly because the plaques are not the cause. In fact, there is one study that I read that said that these amyloid plaques actually inhibit some of the enzymes of glycolysis, which you think okay that could explain why some of this is happening. It's like, oh my god, if these amyloid plaques are stopping the usage of glucose, oh well there you go, but we're looking at it backwards. There are lot of other researchers that think that the cell is already so damaged from glucose from being washed and all this sugar that these plaques are generated as a defense mechanism. It's almost like the cell's way of shutting off that glucose spigot is producing these plaques that stop glycolysis, like, no stop with the sugar already and that's their way of shutting that off because the Alzheimer's patients do not -- they don't produce more of these amyloid proteins that help people.

What happens is they accumulate because the Alzheimer's patient's do not clear it away when they're supposed to do and that is a direct result of systemic hyperinsulinemia.

Robb Wolf: Interesting and I mean this would be pretty analogous to some of the theories that obesity itself is a long term successful adaptation towards dealing with either excessive glycemic load or excessive calories instead

of having this very potentially damaging molecule in the form of glucose be present in excess concentrations. If you lock that up in the form of fat, then it's pretty much inert metabolically compared to glucose being at elevated levels so that can be a pretty good adaptation for a while, but ultimately the system is still going to break under that load.

Amy Berger:

Right and I think I completely agree and it's funny because in obesity, you look at somebody who's obese and or if you're just overweight and they've got all this body fat. They have literally thousands upon thousands of calories' worth of fuels stored all over their bodies so why put all on a cellular level they're starving, right and they're fatigued. They have no energy.

Somebody who has that much fuel on their body should theoretically should almost never get hungry because they should just be constantly using that fuel, but there is something blocking the use of that fuel. I tell people it's as if you've got 10 gallons of gasoline on the backseat of your car in gallon drums.

So the fuel is inside the car, but it's not in the tank where the engine can access it. It's not – you've got to get that fuel into the tank and the way to do that in a human body anyway is to reduce carbs to the point where some of that other fuels start getting used and whether that starts burning body fat in obese people or whether it's to start feeding these brain cells that are starving to death. It's the same strategy as to how to make that happen.

Robb Wolf:

Right. I think Peter Attia uses the analogy of a diesel delivery truck that it's got 20,000 gallons of diesel in the back tank, but the front tanks that the engine runs off other empty and the front tanks would be kind of glycogen stores, glucose mediated metabolism whereas that back tank is actually fat. That mediated maybe even ketotic-driven metabolism and depending – I think again, something that maybe gets lost in all this is ideally, we're able to really shift back and forth between these fuel substrates in a pretty dexterous way that there's not a huge interruption in that process.

If we get some carbs, we can run off of that and it doesn't totally crash us. We don't get rebound hyperglycemia, but then if we don't have any food for an 18 or 24-hour period, similarly, we're not completely crashed by that. Like there should be a lot more kind of metabolic headroom to be able to deal with either caloric or carbohydrate excess or caloric or carbohydrate deficit and we should be able to shift back and forth between that. If we're in a state where we lack that ability to shift, then

we need to do something appropriate to kind of put that Hello Kitty Band-Aid on and hopefully more than the Hello Kitty Band-Aid on the chest wound.

(00:40:38)

Amy Berger:

Right. I agree. I mean, a body that works well, that works the way it should, should be able to switch between these fuels relatively easily and I think most people can at least in the short term, but definitely some people lose the ability to thrive. I mean all of us can survive, right. We can survive on high carb. We can survive on low carb, but how do we feel our best. How do we think our best, look our best, yeah that's important, but that's and in terms of this Alzheimer's stuff, if you want 6-pack abs or do you want to be your old same personality.

Robb Wolf:

Right.

Amy Berger:

So yeah, people just lose the ability to make that metabolic switch and I think that ultimately probably is a mitochondrial function problem because that's where this happens.

Robb Wolf:

If some level then, Amy, this is something I grapple up with all the time trying to figure out what degree of fasting do I need to do, what degree of maybe some cyclic carbohydrate restriction, targeting carbohydrates post workout so I'm really blunting insulin response. I'm trying to figure out strategies for just hedging my bets in that regard. Like what do you feel like are some ways that folks can hedge their bets on a metabolic basis and keep as much mitochondrial flexibility and density as we can?

Amy Berger:

Yeah, I think moderating carbohydrate intake is key and that doesn't have to be 20 grams a day, but it probably shouldn't be 300 even for some of those pretty active, but I think fasting is part of it. It doesn't have to be everyday of a 16-hour fasting, 8 hours eating, but I think people are just uncomfortable with discomfort and we need to reacquaint ourselves with being hungry. It's okay to be hungry for an hour or 2 or 3 or 4. The minute you start feeling hungry, you don't have to shove something in the pie hole.

Robb Wolf:

Right.

Amy Berger:

It's good to relearn the signals that your body sends and you don't have to wait until you get hungry, but just say, okay, I'm starting to feel a little hungry. I think I'm going to wait until your hungry enough to eat a full meal instead of like constantly snacking all day. Even on low carb snacks, there is no reason to really be grazing all day.

I do still think there is a role for post workout carbohydrates maybe not for someone who is 80 and is already with full blown Alzheimer's, but for younger people certainly, I think we can consider more our hormonal state when we eat. Has it been 6 or 7 hours since I ate last? Did I just go for a walk? Did I just do a workout? What state is my body in right now and what should I feed it the best, either refuel or replenish or pump myself up for what's next.

I think too often, it's just, well I'm going to have meatloaf and potatoes for dinner because that's what I said I was going to have Tuesday night for dinner. Well, okay, but is that appropriate for you right now. What happened during your day? Everybody really does need something different, but I think there's a lot to be said for the carb back loading approach. Especially if your lower carb, then you spend most of the day pretty little carb, your glycogen is going to be somewhat depleted even if you didn't do a workout. It will still be relatively low.

Robb Wolf: Uh-hum.

Amy Berger: Probably later on in the day is the best time to eat carbs and I also think of it as earning your carbs. It's not that you have to do a workout everytime if you want a potato or some beans or some parsnips, but I think it's Diane Sanfilippo in Practical Paleo, I think she said something like don't carb load for your desk job.

Robb Wolf: Right.

Amy Berger: I mean, hello, like that's just common sense.

Robb Wolf: Right.

Amy Berger: Like you don't need to eat a whole lot of carbs to sit and watch a movie.

Robb Wolf: Right.

Amy Berger: So I think you can – am I glycogen depleted? Is there somewhere for all this carbohydrate to go and then I definitely think physical activity plays a role, but for the older people especially if we're talking about somebody in their 70s or so that's dealing with Alzheimer's, they're not going to go to crossfit. So for those people, they really do have to keep things kind of low I think.

(00:45:21)

Robb Wolf: Okay, okay. When should people start doing some self-analysis and what type of self-analysis to see if the winds are blowing them towards losing

their marbles at some point in a pretty horrific way, like when should people be looking at blood work? What should they be looking at? Like I suspect I've always been kind of low dopamine, got just a smidge of a hand tremor, have had that since my childhood, don't know if that means I'm predisposed towards some neurodegenerative stuff or that's just how I'm wired up. Like what would you look at like if you were to be consulting with me? What would you want me to go check out and see what I have cooked in?

Amy Berger: Yeah, good question. Like I said awhile back, it's not always going to show in the glucose because if your insulin is super high, well then, your blood glucose is probably going to be normal and your A1c may even be normal. So I would like to see a lot more doctors actually testing insulin levels.

Robb Wolf: Okay.

Amy Berger: And doing – I hate the glucose tolerance test, but if that's something that somebody wants to do, at least try to measure insulin levels along with that, but they can measure I think C-peptide. They can measure some other – I forgot what the name of it. There is some other insulin fraction that they can measure to see kind of your insulin levels, but I would just keep an eye on how things are going in your head. One of the quickest things people usually report when they go on low carb especially if it's new to them, if they are newbie to it is brain fog disappears. These people all of a sudden, they're thinking sharply. They're remembering things without writing them down and think oh, this is how I'm supposed to be. This is how it's supposed to feel when my head is clear. Well, yeah, that's how it feels when you're off the glucose roller coaster and your brain is constantly being fed good fuel that it can use.

I would just be more aware of whether you're having those "senior moments" and this doesn't just go for you. It goes for anybody. Isn't happening more frequently? Are you forgetting things? Are you misplacing things? Is it happening to the point that you're actually starting to worry about it or even to the point that you've noticed it because that's happening so often.

Robb Wolf: Right, okay, okay. I've heard Peter Attia really advocate for both a fasted insulin and then also like a multipoint post meal – postprandial insulin. So we look at what your insulin looks like in a fasted state and you want to do this consistently the same wage time. So if you fast for 12 hours, make the meal happen at the same time and then test at the same time and try to be consistent and then as much as possible, make that meal

with maybe a little bit of a carbohydrate challenge in it. Do it at 30 minutes, 1 hour, 2 hours, 3 hours so that you're getting both the sense of your insulin levels while fasted and then also your response to insulin given a decent carbohydrate load and that should give you then some pretty good feedback about you're not really handling glucose so well like you really do need to ratchet the carbs down so that the total magnitude of insulin and glycemic load is more manageable.

Amy Berger:

Yeah, yeah, because I think even in the context of an oral glucose tolerance test at a doctor's office, your results could look great, but are they great because your glucose didn't rise that high to begin with or are they great because you're insulin shot up like crazy and it brought it back down as quick. I just think there's so much more coming out about that. There's a guy named Ivor Cummins, he's really on top of this. He's got a blog, the Fat Emperor. He's doing a lot of really great research on the role of insulin in all of this and heart disease and Alzheimer's and in diabetes because everyone is really just looking at glucose and it seems to be more and more. The glucose is an outcome. It's an effect of what's going on with insulin.

So there's a good doctor in Seattle named Ted Naiman who they just had a video on YouTube. If people are interested, they can try to Google that or just follow him on Twitter, he'll post it. It's fascinating because I just think we're going to miss the boat if all we look at is glucose because it's not – it's type 3 diabetes. This is not type 2 diabetes. This is not – your blood glucose might not be 250. It could be 105, which is not really that high compared to the average person out there.

(00:50:18)

Robb Wolf:

Oh yeah, I know Ted, yeah, yeah, yeah.

Amy Berger:

Yeah, he's great and so he and Ivor, they're all over the stuff and I just, I think the guys name is Joseph Kraft. He wrote a book about this way ahead of his time about the insulin rather than the glucose itself.

Robb Wolf:

Interesting, interesting. Yeah, it seems to go in a lot of circles with this stuff, but this is again coming back to some of the early Cordain and Boyd eating research when they took a pre-agricultural hunter/gatherer type folks, Kitavans for example and tested their oral glucose tolerance. They showed really, really good both glucose disposal and a very modest insulin release. So it wasn't requiring a lot of insulin and they weren't getting an excessive insulin response to a very large carbohydrate bolus and so it showed that they were pretty darn insulin sensitive and had good insulin signaling and what not. So just baked into the cake, they were pretty healthy in that regard.

Amy Berger:

Yeah and I think there are genetic factors that play into that, that it maybe that particular tribe in that particular geographic area, they are evolutionarily conditioned to handle a certain type of diet just fine and that might be really different from the plains Indians in the US or someone up in the Arctic. But it's – there's that APOE4 that people call it Alzheimer's gene and people think that, oh, I'm genetically programmed to get Alzheimer's. Well, it seems that the APOE4s – they seemed to have the worst response on this very high carbohydrate diets and there's a lot of questions about whether or not they do well with a lot more fat too because what happens to their blood glucose versus their lipids, it's a little bit questionable. We're not really sure about the deal is there, but I just read a paper the other day that said the E4 has produced less insulin degrading enzymes.

An insulin-degrading enzyme is an enzyme that breaks down insulin obviously, but it also degrades these amyloid plaques, which is that that's one of the reasons why systemic hyperinsulinemia causes these plaques to form and accumulate. Because as long as there is appreciable amounts of insulin in the blood, this enzyme is going to go after the insulin and it's going to leave these plaques to stay and accumulate and solidify and get in the way of the synapses between the neurons and basically just have all these – they just gunk up the cells. The E4s produce less insulin-degrading enzyme and that maybe because this E4s were genetically conditioned or evolutionarily conditioned to not need as much insulin-degrading enzymes.

Let's hypothesize maybe they were conditioned on diets that were lower in carbohydrate to begin with. They would have less of a need to degrade insulin because their diet was less insulinogenic then it makes sense that now in 2015, when we're awashed in cheap carbohydrate, these people are getting the raw end of the deal, but they're not... I have to make it clear that there are plenty of people who are homozygous for E4 that don't develop Alzheimer's and most of the people with Alzheimer's are not APOE4s.

Robb Wolf:

Right.

Amy Berger:

The number one biggest risk factor for Alzheimer's is systemic hyperinsulinemia. So it's like this APOE4 thing is, it's not a red herring, but it certainly doesn't cause Alzheimer's. It does make you more susceptible, but it's not a death sentence.

Robb Wolf: That's so much of the genetic testing makes me crazy like the BRCA1 breast cancer gene. People look at it as a guarantee of breast cancer, but again, the correlates tend to be insulin related and nobody ever, ever mentions that there is a huge evolutionary advantage that's had with the BRCA1 genotypes and host of other genotypes that may have some epigenetic inputs that can shift them to a nefarious state, but folks women with BRCA1 genotype tend to have lower rates of infection, better child bearing years, more kids like their fecundity is greater. So there's a bunch of kind of evolutionarily baked into the cake benefits that if we get some epigenetic triggers overlaid on those genetics, then they can turn on us.

[0:55:06]

It's really frustrating to me that even if the highest levels of research and education on these topics that were not – on the one hand, when we're telling, we're exploring some of these genotypes that were not hand in hand explaining okay, there maybe some risk factors here, but there's definitely some benefits. Like part of the reason why you are here is because of the benefits of this stuff. It's not something that's inherently broken. We might just have a diet and lifestyle that's broken.

(00:55:35)

Amy Berger:

Right. I mean that's what epigenetics is all about. Is anyone genetically programmed becomes sick? No. We're triggering these illnesses based on things that are discordant with what we are conditioned for and I just – it kills me because people that are trying to develop drugs are doing – it's the same thing they're doing with cancer. They are trying to target genetic mutations or trying to discover some kind of silver bullet like, oh, this is the mutation that causes Alzheimer's and they fail every time. There's nothing. There is literally no pharmaceutical intervention for this condition.

Robb Wolf:

Right.

Amy Berger:

So why don't we stop it at the source instead. Let's patch the hole in the dam instead of trying to manage the flood after it happens.

Robb Wolf:

Right, right. Well, that's one of the books I've been fiddling with for a while is a little history on medical history and antibiotics worked so well that I think it conditioned all of medicine, all of research to really have an expectation that there was a one disease, one cause, magic bullet solution for everything. I think that we got really, really successful and saw some great benefit with antibiotics and it's not going to work for almost anything else and that simply, it's not just going to happen. These complex disease states need multivariate interventions, sleep, food,

exercise, gut biome and that's tough to package into a pill or get a patent on.

Amy Berger:

Yeah and certainly, it is difficult. I mean I don't want to sugar no pun intended, I don't want to sugarcoat it, but the book that I wrote, I wrote it for the layperson obviously. I mean I would love if some doctors and some dieticians want to get their hands on this especially if they work in some type of elder care facility or an Alzheimer's facility. But I wrote this to empower the caregivers, the children and the spouses of people with Alzheimer's or mild cognitive impairment so that they can understand, here is what's going wrong. Here is why we think it's going wrong and based on that theory, here's how to fix it because it's not easy. It is going to require a multifaceted intervention and some of this – these families are going bankrupt because whether it's long term care of some of them have to stop working in order to take care of their parent or their spouse and there's nothing to help them and all I'm saying is let's try this.

Let's use Robb Wolf greasy used car pitch like just try this. If it doesn't work, it doesn't work, but there's nothing else out there. They're not hearing this from their doctors. All this fantastic information that's coming out of a lab, that's coming out of the PhDs doing the research, they don't have time to write books like this for the average Joe on the street to understand. I wrote this as kind of the English translation of the research into something anybody's mom or dad or guy next door can understand and implement and it's not easy. You have to be in control of the person's food supply. You have to make sure they're getting enough sleep. It is I wouldn't say it's a full time job, but certainly, you can't leave this people to their own devices. This does have to be managed. It has to be – you have to have your ducks on the row if you're going to help somebody with this. So I don't want to make it sound like it's easy, but there's nothing else out there and I just think this is worth trying if nothing else.

Robb Wolf:

Awesome, awesome. I'll throw this out there and then I want to talk to you about this actually offline, but a good friend of mine Tori Zellick wrote a book called The Caregivers Day Planner.

Amy Berger:

Oh.

Robb Wolf:

She navigated the long protracted decline of her mother dealing with breast cancer and was pretty appalled by the lack of resources for the caregiver and so she put together this book and it's amazing. Like you take it with you to the doctor. You take it with you to every medical events and it provides places to document the food, the medications and

all that stuff so that every single of it gets documented. Everything is right where you need it. The doctor knows where to look for. The pharmacist can update stuff and so I think that there could be some really powerful synergy there. It's called The Caregivers Day Planner and I definitely want to introduce you to her offline so.

(01:00:09)

Amy Berger:

Yeah that sounds great. People need that. I mean caregiving – if you weren't already sick, you could make yourself sick being a caregiver just because you will neglect your own health.

Robb Wolf:

Right, right, yeah, yeah. It's – yes indeed, yeah. So Amy, where can folks track you down in particular the Alzheimer's antidote and the continuing awesome work that you do in online?

Amy Berger:

Oh thank you so much. My book is called The Alzheimer's Antidote and it's at alzheimersantidote.com. It is an E-book. It's just PDF that you download. If there's any publishers out there that are listening, I'm definitely amenable to a real book deal, but by website is tuitnutrition.com. You can check out my blog there. I have my services what I do there. That's it on me. I mean I'm on Twitter @tuitnutrition and...

Robb Wolf:

And you're all over the Robbwolf.com message comment section. You're easily our most prolific and educated commenter on there so thank you.

Amy Berger:

Oh no, thank you, not always, but sometimes I try to get on and I only comment when I feel like I had something useful to say. I'm not going to just write a comment that says, hey that's great, I agree. If I have something meaningful to contribute, then I try to do it.

Robb Wolf:

You've had some great stuff and you've unleashed some big boot ass kickings on there every once in a while. And people need one so--

Amy Berger:

Thank you so much.

Robb Wolf:

Yeah thank you. Well Amy, it's just a huge pleasure finally connecting with you. It's kind of funny in this virtual worlds, you build – at least in your head like these relationships with people. It's kind of like I've "known you for ages through Twitter and Facebook and the blog and all that stuff" So it's kind of funny you get a sense of a relationship that really isn't as fleshed out as what it could be and truly a huge treat to talk to you. Really stoked for the work that you're doing. You do a lot of individual consulting too, talk to folks a little bit about that before we wrap up.

Amy Berger: Yeah I mean I am in private practice as a nutritionist. I'm trying to grow that so if there's anyone when out there. I'm currently in the DC area. I live in Northern Virginia, but I am potentially relocating to the Pittsburg area sometime later this fall. I went to Craggy Mountain and I just love Pittsburg, but I consult via phone and skype too. I've had a bunch of people in the UK and in Ireland already so wherever you live, I'm accessible and I will tell people I'm not any kind of zealot. I try to make it livable for people. I try to kind of say here is what you should do. Here is what you can get away with whether it's for Alzheimer's or weight loss of inflammation or diabetes or what have you, whatever strategy you're going to do, you have to be able to live with it and if I say, you can never ever, every have XY and Z ever again and that's a deal breaker, well then, let's figure out a way that you can fit in X, Y and Z now and then and ot derail yourself completely.

Robb Wolf: Right. Absolutely. I love it. Well Amy, thank you so much for taking the time coming on the show today, a ton of fun chatting with you and you're doing fantastic work. We will have links to all of your contact and the Alzheimer's Antidote in the show notes and look forward to meeting you in real life here sometime.

Amy Berger: Definitely, definitely. I'd love to. Thank you so much for your time too.

Robb Wolf: Alright Amy. Take care.

Amy Berger: Okay, you too.

Robb Wolf: Bye-bye.

(01:03:54) End of Audio