

Paleo Solution - 186

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Robb Wolf: Robb Wolf here. Dr. Kirk Parsley is in the house.

Dr. Kirk Parsley: Literally.

Robb Wolf: Literally in the house.

Dr. Kirk Parsley: Literally in the Robb Wolf house.

Robb Wolf: We don't have our large and in-charge co-pilot Greg Everett today but I don't think he's crying any salty tears for not getting sucked into these shenanigans. Doc, what's going on?

Dr. Kirk Parsley: Well, not much. Just trying and came out here to do this Specially Health gig trying to impart what little wisdom I have on the rest of the population, get the population into some good sleeping habits and see if we can fix the world – all the world's problems.

Robb Wolf: Sweet. I like it. Kirk and I were just talking that it blows doing a podcast in the same room because theoretically we should be making eye contact and good conversationalist and everything and instead we're trying to stick our domes next to the mic and all that stuff. It's awkward, folks – it's awkward.

Dr. Kirk Parsley: I'm just staring at this phallic shaped microphone and just trying to keep myself calm.

Robb Wolf: Well, I took a condom off of it today for you at least.

Dr. Kirk Parsley: Sweet.

Robb Wolf: Speaking of condoms, we should probably get to our podcast sponsors. Why don't we lead in with... Actually I was thinking about this my pretty funny lead in for the Bunny Ranch for the condom deal so it seems like a good one. But we'll start with the bunny ranch. Bunnranch.com. Dennis Hoff's amazing offering to humanity out in Carson City. If you click on bunnyranch.com and clearly this is an adult site so just use your best judgments on that.

We have performancemenu.com - journal of nutrition and athletic excellence. You get a subscription to the journal for \$30 a year for the base subscription, \$100 a year for the super jiggy full meal deal happy ending massage gig through...

Dr. Kirk Parsley: Kinda like the bunnyranch.

Robb Wolf: Kinda like the bunnyranch. So definitely check out performance menu.

We've got the frontdeskhq.com. We will have my wife back on the show here pretty soon as well talking about business stuff but if you own any type of the service-based business, dog walking, alligator wrestling – anything – where you need to sign people into a front end portal and you want dispense with what usually goes as a front desk, you can use a mobile device like cellphone or an iPad or something and run your whole kit and caboodle from that and...

Dr. Kirk Parsley: I don't have a caboodle.

Robb Wolf: You're in Southern California so caboodles are generally looked down upon. That totally makes sense.

And then finally, wellfoodco.com. Wellfood is your solution for Paleo type snacks. We have some phenomenal grass fed jerky, grass fed whey protein. If you're following my Crossfit football and wanna be huge and move on to Jack Street where John Welbourn lives so check out wellfoodco.com.

Dr. Kirk Parsley: Didn't he live at the top of a beanstalk or something?

Robb Wolf: That's his vacation home, yeah, totally. So let's see here. So we put up a blog post asking for questions yesterday. Today is Friday so we've got all the shiz rolling here. So, oh, I was gonna miss one. Okay, so, here we go.

Luckily, Doc Parsley is on the ball here. So we've got a question from Joseph. "Doc Parsley, I was diagnosed with stage 3 adrenal fatigue, too much law school, coffee and not enough sleep – that's a shocker. What advice can you provide for getting my adrenal glands back on line? Robb, I remember you mentioning you suffered from adrenal fatigue. Could you talk about your experience recovering?"

Dr. Kirk Parsley: Do you wanna go first?

Robb Wolf: I guess I could go first. So running a gym, trying to do crossfit, trying to work for crossfit, writing a book – all those things were, I think, pretty negatively impactful on my adrenal status. I was drinking coffee like an absolute idiot. I had a stove top espresso maker where we would make 16 shots of espresso at a time. And between Nikki and I at one time, we were drinking 5 pots of that a day.

Dr. Kirk Parsley: I don't know how that could be bad for you. That's surprising actually.

Robb Wolf: So all that stuff was bad. I would make a little forward progress, a little backward progress but the thing that really crushed me was doing the I Caveman Show for the Discovery Channel. I basically starved for 10 days straight, lost 18lbs, didn't sleep more or less for 10 days straight.

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And I would say I was tethering on the brink before that event and then after that I was absolutely smashed. And I started actually working with Doc Parsley a little bit. He recommended some blood work. I got some input from Chris Kresser. We started doing some sniffing around looking up my thyroid TSH levels, testosterone levels and everything and we basically... We titrated me off coffee.

I really started protecting my sleep at gun point even though when we first started doing this was right when Zoey was born. And that was not the easiest fucking time to.

Dr. Kirk Parsley: Six months of sleep lost in first 2 years.

Robb Wolf: In the first two years, yeah. So that was not the easiest time to start this but I've got to say the process of doing it I think was a life saver probably in legitimate terms. Supplement wise we started doing some DHEA. We did some propping up trying to prevent the DHEA cascading into estrogen. We did just the basic like off the shelf adrenal support and those were the big, big, biggies that I think have really stirred the boat around.

Dr. Kirk Parsley: And I can remember if we used an ashwagandha root, and licorice root as well.

Robb Wolf: Oh, you know what? That's true. Early in the whole cycle, I was given the liquorice root which liquorice ends up blocking, I used that in the AM and it blocks the degradation of cortisol so it helps your body to... I had a

flipped circadian rhythm. I had low am Cortisol so I'd be tired and dragging ass and it would be higher in the evening.

And so I did the liquorice root which this is where it's really important to track down a functional medicine doc or somebody who knows what they're doing with this because liquorice root can also dramatically elevate your blood pressure so you need to really keep an eye on that and this is where self-diagnosis, self-medication can be highly problematic but...

Dr. Kirk Parsley: Yeah. So that's a nice underhand pitch. That's basically my lead in for that. There's some obviously some pretty generic ways of going about it that it's all over the counter and it's a one size fits all solution. I probably had very similar problems to Joseph here after medical school. So I don't think that there's anything extraordinarily unique about his problem but I still hesitate to go on a one size fits all kind of over the shelf thing.

So I would search out a functional medicine doc or naturopath or somebody smart in that area but there's a litany of things to be done and there's a litany of things to be tested. Usually when you have that amount of sleep deprivation, you've gone well beyond screwing up your adrenal hormones.

Like we talked about in the last show, everything matters. All hormones matter. All hormones affect every other hormone. And everything in your body is controlled by hormones and neurotransmitters and neuromodulators and eicosanoids and all of those things which are just essentially hormones.

So a simple thing you can decrease stimulant use to try to get your adrenals back, you can use some over the counter substrates which are basically vitamin Cs, high dose of...

Robb Wolf: B vits.

Dr. Kirk Parsley: All the B vitamins, some other things that may be postulated with helping with adrenal function, various roots and things that I'm not super smart on and that's basically providing substrate but that's like bringing lumber to the construction site and if there's no worker bees there with their hammers then it doesn't help without the lumber there. So you need to figure out if things aren't working, more substrate's gonna help you.

So I would get a full metabolic panel test all the hormones, all metabolites, electrolytes – all those things, something as simple as a

single trace element, sodium or potassium or something like that, affects your neurons which affects your neurotransmitters which affects downstream affects your other hormones and hypothalamus regulation which rules pituitary regulation and all sorts of other things.

So really hard doing something in a snapshot like that but I would say pretty likely some 5-iodidase inhibition leading to some reversed T3, probably some phase shift if he doesn't have straight adrenal fatigue, probably some phase shift in there, probably some inflammatory cascades and some insulin sensitivity issues – all of that stuff. So I probably wouldn't just try to do it on the self. It's my advice.

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Robb Wolf: So what's the timeline for Joseph if he gets in, finds a good doc that help support him through days, I mean it almost seems like it's a bell curve kind of thing like whatever the damage was on the front end is a little bit of a recovery period on the back end.

Dr. Kirk Parsley: For Sure and depending on how aggressive you wanna be with it. So say his testosterone is low and maybe he's only 30 years old, right? Probably the solution there is some relatively high doses of DHEA and something like zinc citrate to help interfere with the estrogen conversion, getting testosterone back up there with some good sleep and some good exercise better in a month but ideal probably 6-9 months. So you'll feel better and you'll feel better and you'll progressively feel better over time but if you could take something that simple.

But say I don't know how old he is. Maybe he's 46 years old, this is his second career in law school and he literally has testosterone in the dumpster, maybe you'd get something more aggressive. You can use some HCG to stimulate his testicular function maybe even do a testosterone taper with him and then, yeah, he feels better immediately, right, and he'll probably never feel bad again as you start tapering all on the other stuff up you will build up his normal testosterone and that's one aspect obviously.

Probably the thyroid's involved as well. Thyroid recovery is pretty quick, as you know, at least the healing of it is pretty quick once you put the thyroid levels back to normal, you'll feel just like your thyroid's producing well. How long you take your thyroid to get back on step is anybody's best guess.

Robb Wolf: So I know there are some and not to go too detailed on the rabbit hole on this thing but there are some folks out in the functional medicine scene that are super nervous about say like high dose DHEA or even putting certain people on say like a testosterone replacement therapy for periods of time but what you're...

You mentioned it right as you launched in that we could be providing all these substrates and B vitamins and glandulars and stuff like that but if the worker bees aren't there, like if the hormonal system is so broken and were so inflamed that things may not repair.

Dr. Kirk Parsley: Very, very true which is why I say you can't do it alone 'cause you really need blood values for all of this stuff. What I tell somebody, "Hey, just go grab some DHEA and start popping in." If I knew him, maybe if he's my buddy...

Robb Wolf: Yeah, maybe.

Dr. Kirk Parsley: 'Cause he's not gonna sue me but DHEA is a hormone. I mean it's, you can call it a pro-hormone if you want but I mean it's a hormone. It leads to hormonal effects. Nearly every other hormone requires a prescription for reasons... These things need to be monitored and if you find out that you're DHEA is super physiologic and your estradiol is still low and your testosterone's not coming up, that's something you could find out within 3 or 4 weeks of starting to take DHEA.

And then you say, "Okay, there's something else going on here. We need to abandon this approach and let's start going here otherwise you can do this for 6-9 months and your DHEA is twice the normal range – your usual range – but your testosterone doesn't move is one example right?

Or you start changing your diet to improve iodine uptake to improve thyroid functioning. Unless you test your thyroid, you don't really know if it's worth it. You can eat all you want and you try to cram yourself full of all the substrate you want. But if you aren't measuring the end result, you have no idea what's going on with it and sadly that's not something that can really be done from home just quite yet.

Robb Wolf: Right, right. Cool. Let's see here. David, "Hi, Kirk and Robb. Just had my hormonal test come back from a functional medicine doc am Cortisol is within range." I'm not gonna give all the exact numbers. I'm just gonna give the big picture deal because the exact numbers are in the show notes.

Dr. Kirk Parsley: It's suboptimal cortisol functioning. Just say that.

Robb Wolf: It is basically just all the way across the board.

Dr. Kirk Parsley: Yeah.

Robb Wolf: But he... Let's see here. PM he is not super high so we're not really seeing a flipped circadian rhythm.

Dr. Kirk Parsley: Yeah, so I don't think he has a phase shift as much as he has either adrenal exhaustion or dysregulation – whatever you want to call it. That could be substrate based and that could be receptor based just like... Everything in your body gets stimulated by something else.

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There's some feedback loop that's monitoring and ACTH that tells your adrenals to start doing more of what they're doing can be – what's the word? Not accommodated. What's the....

Robb Wolf: Down regulated?

Dr. Kirk Parsley: Down regulated. So the response to any of that stuff can be down regulated so super high, super long high stress levels for a long time can lead to that... yeah in your slide what's it called flattened fatigue or something.

Robb Wolf: Oh, yeah. The tired and wired... Yeah. And the next one is flat as a fritter kinda gig, yeah.

Dr. Kirk Parsley: So that's really what it looks like he's dealing with. Yeah, he has 16.4 in the morning but if he's a fairly young guy, that's not a very good level whatsoever. And then if you'd look, if he's normal at all, he's at the very low end of normal, his DHEA sulphate I don't put a lot of stock on. That's bound, the free DHEA, unconjugated DHEA is a more important number to me to let me know what his DHEA reserves are.

That's available to do the other things I'm talking about DHEA sulphate itself doesn't go directly to testosterone. It has to be unconjugated. So that... And it doesn't go directly to cortisol either. So those are the issues that pop out to me at first. So if he's on DHEA and he's on pregnenolone 12-18 months to fix and according to his functional med doc is pretty long time frame.

Not sure I would be that patient if were him. For him it might be smart to just do a Cortef tapers. So it's basically just taking cortisol and his functional med doc should have sort of some protocol for that. I have my own protocol but they're very different. They vary from doctor to doctor so I don't wanna promulgate mine.

Robb Wolf: Remind folks just in big picture what that cortisol taper is.

Dr. Kirk Parsley: Yeah, so essentially, it's no different than to say thyroid or testosterone. If I give it to you, your glands that ordinarily secretes that stops producing it as much, right? So if we are dealing with some adrenal fatigue, we're gonna give his adrenals a rest essentially.

We're going to give him artificial – well, it's bioidentical but we're gonna give them exogenous, coming from the outside in, cortisol and we'll do it over a sustained amount of time not so long that we start interfering with his inflammation or his immune system or anything like that 'cause you can't suppress immunity and it can lead also to bad things if you go with super strong steroids, corticosteroids or butane for a really long time.

So a pretty short burst of that somewhere in the 2-3 week range, make sure there's plenty of substrate and he's on pregnenolone and the DHEA, make sure he's got that in check, make sure that he has all the adrenal support complexes. He could do some of the herbal things, if his doc is comfortable with regulating that with licorice root and ashwagandha those types of things.

Make sure all the substrates are there. Do that. And then the biggest thing is to make sure that his thyroid's in order. I don't see anything about his thyroid but it's pretty hard to get adrenals back if the thyroid's off. But, again, everything matters.

[Cross talk]

So that would be my take. And again I don't know how old the guy is, checking the sex hormones might be something that you consider as well. Building everything at the same time is a lot faster than trying to piece-meal it, and then the other thing is how good is the sleep he's getting. Make sure that he's getting some really, really solid sleep 'cause that's the best time to recover adrenal function.

Slow wave sleep cycles. The deep sleep is exactly the opposite of fight or flight. He's been running around near fight or flight for who knows how long. He's get some adrenal dysregulation because of it. Let's spend as

much time with minimal adrenal function as possible which is paralyzed stage 3 slow wave delta sleep.

Robb Wolf: So you're saying he should compete in the crossfit games immediately.

Dr. Kirk Parsley: While drinking espresso in between sets.

Robb Wolf: And using some alcoholic.....So, yeah, perfect. Okay. Cool, cool.

Dr. Kirk Parsley: How long is this one?

Robb Wolf: Okay, this one's Jack Penner "What are your thoughts on chronic fatigue as it relates to the HPTA Axis? I just finished writing my senior thesis on chronic fatigue syndrome and nutritional interventions. Now I'm convinced that a huge part of CFS is just running ourselves into the ground with poor sleep, too much stress, bad nutrition."

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"As far as I saw the glucocorticoid and immune profile and the literature seems like people with CFS are all in different places on the spectrum of chronic inflammation, chronic HPA stimulation. Have either of you experienced with Paleo alleviating CFS I would really like to expand the paper to become Paleo Diet and Lifestyles as a means of alleviating CFS. Any insights you guys have could help me keep in that direction. Thanks for having Doc Parseley. Really looking forward to podcast."

I've seen CFS actually more as a metabolic issue personally than specifically adrenals but that said a metabolic issue being more like insulin resistance, high low blood sugar, magnesium deficiency and not really too sure this is what they call it syndrome. There's all... there's multitude, as Greg loves to say, a various variety of stuff going on.

Dr. Kirk Parsley: That's repetitive.

Robb Wolf: Slightly repetitive. I think Dr. Mike Eades in his 2001 book Protein Power Lifeplan really talked about this pretty well and type back into systemic inflammation, metabolic derangement and magnesium deficiency and so addressing all that stuff but then that said just like Kirk has been saying in every answer you've given so far all of this stuff matters if you're in a hypoglycaemic, hyperglycaemic state then we're tweaking the adrenals to try to keep the blood sugar normalized when we're going from highs to lows and stuff like that.

So it's really trying to figure out what are those lifestyle features that are leading into what I think is probably more of a metabolic issue and trying to fix that but again it could be sleep, it could be stress, it could be bad diet, it could be all of those things. It could be one new stressor that has taken things like a sub clinical kind of a sub acute gluten sensitivity and makes it a chronic issue.

And where normally if the person is well rested it might be a little bit of an issue but now it becomes a major issue and if the guy gets damaged you don't absorb magnesium and on and on and on. So I think that that's where this kind of big picture shot gun approach is pretty good.

Dr. Kirk Parsley:

Yeah I agree. I think if I were Jack and really look into... go further down that rabbit hole you're doing a thesis or something on this I would consider a couple of options. For anyone who doesn't know listening to the podcast the reasons syndromes are called syndromes because they're not clear. It's not a clear diagnosis and labelling it doesn't do anything other than give it a label that gives some people a vague idea of what's going on.

But the whole idea of the syndrome is that there's a whole spectrum of things going on that we can't put our finger on what's leading to so we didn't want to call it a certain diagnosis because it's not an agreed upon treatment. But I strongly suspect that chronic fatigue syndrome has a huge neurological component to it.

Obviously there's hormones in your body that make your body grow alert and able to move and in fact those... the by product to allow that movement is adenosine right from ATP utilization from ADP to ATP creating I guess a degraded. Now that adenosine build up has a lot to do with neurological function. That neurological function then controls all of the downstream hormones.

Then the other thing that is related to this... he mentioned HPTA Axis which includes a lot more adrenal we're talking really about everything from the hypothalamus down to the testes or ovaries really, all the endocrine organs in that pathway, all of those things are going to impact it. Neuro regulation and all that stuff is what the money shot is.

So I would travel on that route though and try to figure out if there's some well established or at least postulated neuro transmitter exchanges that are leading to under stimulation or over stimulation of certain nuclei and hypothalamus.

And then the other thing is the inflammation like what you already mentioned what I tell my patients all the time is when you have the flu it's not the virus in your body that's making you feel bad. It's your reaction to the virus in your body. That inflammation is very very... require a lot of energy.

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When you use that energy to fight off a virus that's assuming you don't have to move around which makes you feel fatigued. I think that there's a huge inflammatory component with most chronic fatigue as well and again because of this syndrome thing I don't think it's all coming from the same place. You've got to figure out what's wrong with all these guys.

We kind of go back to the basics what we're talking about optimize metabolize, optimize hormones, optimize sleep, optimize your nutrition, optimize your exercise and then let's see if you still have chronic fatigue because once we have a list of optimize now it's easier to refine something of variance like magnesium deficiency or something...

That would be my recommendation to them but I can't say I know the answer. If I knew the answer I would just write it for him given I have a lot of spare time.

Robb Wolf:

Tons of spare time. That would make a good book two if we had the exact answer.

So William has a pretty quick one "Hey fever, grass allergy... is it better to suffer with the allergies and I assume inflammation or go with the low dose antihistamines for four months of the year."

Dr. Kirk Parsley:

Well that's a lifestyle choice right there. If he's doing... if he has a super low inflammatory diet and he's already using fish oil and his metabolic panel looks good and he sleeps good and all that and you really just can't kick this that's not an unreasonable thing to do. Depending on exactly what his symptoms are and he could use a decongestant instead of an anti histamine if that works for symptoms.

Histamine is an alertness hormone or neuromodulator in your brain that makes you feel alert and happy and smart and all of those things so diminishing that diminishes those functions which is...

Robb Wolf:

Possibly valuable.

Dr. Kirk Parsley: Possibly valuable maybe a high cost to pay for some sniffles. It depends on how bad his symptoms are and what his feelings on this are but again optimize everything else first if that's already been done and then consider that but in my clinical experience it's usually not everything's been done yet. So lifestyle modification and nutritional supplementation and all those things will be my first.

Robb Wolf: It's kind of funny. This is where these answers start becoming the same thing again and again and again. I was talking to Greg about this. I'm like do we even keep doing the podcast? It's the same answer every time but it looks like kind of unique snowflake situations is like I have asthma. I have allergies. I have chronic fatigue.

Clearly there are distinctions and it is complex and there's different vectors to what the addressing a lot of the stuff ends up being pretty similar. We've seen so many people report that their allergies are greatly improved by eating grain, legume, dairy free paleo type diet, making sure their vitamin D is good and particularly when you get vitamin D from the sun because it's interesting when we're talking about over activity of the immune system sunlight exposure has a really interesting immune modulating effect.

It reminds me of the whole low dose naltrexone that they use in cancer and autoimmunity research because it's both insulin sensitizing and it kind of down regulates the immune system but it does it in a really subtle kind of benign way. So for generally reducing inflammation from the gut side and then we're getting the sun light, the proper sleep and all the rest of that then you may still have allergies but they're going to be dramatically improved.

And in addition to what Kurt mentioned with blocking histamine because histamine has so many important effects one of the really important effects is that histamine is a precursor for growth hormone production and the whole cascade that goes into growth hormone production is usually part of the sleep cycle.

So we get into this really catch 22 kind of story...

Dr. Kirk Parsley: Threshold training and assuming that would work.

[Cross-talk]

Robb Wolf: So your normal kind of hormetic adaptive response to grappling or cross fit or something like that ends up getting really blunted. So where do you

end up if you block the histamines? You end up ultimately more inflamed which then ends up making you more prone to environmental insults like rag weed or whatever.

So clearly you have to look at this and do a cost benefit kind of deal. If you were just crushed by your allergies and you're doing everything that you can think of - you've got a decent tan, you're getting your satellite, your vitamin D squared away, you're eating, orthodox Paleo so that the Paleo gods in hot lava lands sing your name then that's something to think about but as a first stop the anti histamine isn't that great of a solution.

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Dr. Kirk Parsley: Again the down regulation, the desensitization to anything that you're taking exogenously and I don't... I can't honestly say do a ton of chronic inflammation or allergies and antihistamines as far as laboratory evaluations and following up and so forth but with the sleep I'm absolutely positive documented over and over again not just in my clinic but clinic of other people validate that an antihistamine for sleep only works about 3 to 5 nights.

And then it just doesn't work anymore because the effect is blunted so quickly and because histamine is such an important neuromodulator... I don't know I guess, and an eicosinoid, and it deregulates and kills other things, I don't know what you'd call it at that point. But because it has so many important functions I think it's something that's very hard to suppress is my thinking on it. So I don't think chronically it's going to be that beneficial for him.

Robb Wolf: So this one's really long. Do you want to skip this one or do you want to tackle this one?

Dr. Kirk Parsley: Well I think we can summarize that and just say hey...

Robb Wolf: This one's from Patrick yeah.

[Cross-talk]

Dr. Kirk Parsley: You way too much for way too long.

Robb Wolf: He was doing cross fit, he hurt his shoulder. He was eating low carb during this thing.

Dr. Kirk Parsley: And now I'm 30 and I'm still trying to work out and I had some family history of cholesterols and wants to know should he take a statin and is there any way... has he done something irreparable to his adrenals basically I think is what it is or is it liver function affecting his adrenals.

We all know my answer to that. Everything affects everything. So your yes, your liver function is related to your adrenal function and vice versa and no, you're not just getting all that you need to do with it especially at 30 I hope.

Robb Wolf: There'll still be a few cut backs like 3 to 4 years of upside before the wheel start falling off.

Dr. Kirk Parsley: I hate to think that they're usually all... I don't know if that makes me geriatric if that's...

Robb Wolf: It's just like Larry King or like Bea Arthur or something.

Dr. Kirk Parsley: Again nothing really... is he the guy that said he was 100% Paleo?

Robb Wolf: No.

Dr. Kirk Parsley: So again without knowing how much of this other stuff he's optimized that again is where I would focus. He says he's a clean Paleo template, he's getting good sleep and his stress levels are reasonable I guess and on medication...

So if he's doing all that stuff let's go measure that stuff first. See if doing that stuff is getting the effect that he wants. Are there some simple things that we can test through all sorts of things? We can test his fitness. We can test his VO2 max. We can test his metabolism. We can test his hormones. We can test a litany of things to figure out is he actually getting the benefits that he wants out of this exercise routine and is he truly just an ASI would be nice to say maybe it's not your adrenals at all.

Maybe it's chronic inflammation. Maybe you haven't beat down the inflammation pathways. Maybe your CRP's really high and there's some things we can do to start getting rid of the inflammatory cascades and statins, yes, freak me out as well. Do statins have a place if you're doing everything else perfectly but experience with Specially Health.

The dosage of statin is 1/10th of the normal unless what you would ordinarily need and one would hope if you need that it's... that the risk

associated with statins is mitigated by lower dosage. One would suspect. It's not yet proven in an RCT5.

Robb Wolf: Like so many things that haven't been proven yet.

Dr. Kirk Parsley: But I would feel safe in making that assumption.

Robb Wolf: Isn't pharmacology 101 is like here's the dose response curve and also the, again the Hippocratic kind of deal, the poisons in the dose.

I guess mentioning the hypercholesterolemia that you have if you contact Specialty Health, you go to a website you can ping them, you can get a really super jiggy assessment they pump it through HDL labs so you get the LDL particle count. You get the LPLa, LPPLA 2 like all of these kind of important but lesser known lipoprotein subfractions.

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You get a number on that. They will give you a red light, green light, orange light as to where you play out on all that stuff with your metabolic parameters. They will do the full testosterone... you could basically request the super jiggy package and they are offering ASI test to them now so they can mail that to you. So if you want to follow up on it they can definitely enroll that stuff.

Dr. Kirk Parsley: And that light headedness that you mentioned with golfing I would have to say very very strongly associated with these adrenal function. I'd say almost certainly...

Robb Wolf: Hyponatremia and...

Dr. Kirk Parsley: So whether it's the... frankly the output of his adrenals or blood glucose dropping from no cortisol secretion or like exactly what's going on but assuming he's hydrated and that's not hypovolemia which is probably is not the case especially at 30. That's probably all adrenal and definitely the anxiety like we've talked about the cortisol epinephrine norepinephrine mismatch and sort of the adrenaline cortisol mismatch which you insert parts of your adrenal secreting different hormones one part's fine and the other part's not and you get all the anxiety but none of the other good effects.

Robb Wolf: It's like buying the wrong pot basically.

Dr. Kirk Parsley: Something called this is permanent.

Robb Wolf: Yes it's not the comment, it's the permanent.

Dr. Kirk Parsley: So I don't have super specific advice on how but find a good doctor and I think that's probably a little too complex to work out himself honestly and Specialty Health would be a good start especially for the hypercholesterolemia.

Robb Wolf: I'll just throw it out there to folks. I'm actually looking for some guidance on the podcast because I feel like we've got a depth of knowledge in the basic population now that 80%, 90% of what ails you kind of gets to if you read the book, if you just go to the front page of robbwolf.com or go to Mark Sisson's site or whole nine or anybody go to these different sites you're going to get 90% of what ails you dealt with.

And then what we're left with is the other 10% where the wheels are falling off the wagon and it's very very specific and so I'm casting about a little bit for what do we do to help you guys. What's the utility here? Because I have felt like recently that it's like well it all depends and you need to do all this and then you need to follow up on the doctor and I feel like that's the link we need to answers.

So I'm interested to know how we can be more effective with this but these are the questions that we're getting and this is also the primary reason when I wrote my book and I wrapped that whole thing up I literally sat down for a couple of days and I was like the world is saved. I'm going to farm coconuts.

It wasn't quite that way and I was somewhat surprised that it wasn't because one, people wouldn't do what I told them to do in the book and two there were actually layers of complexity that I had not considered in the book that people needed help with and that's why I circled back round and started the Paleo Physician's Network with the plan that at some point we're going to get some sort of an evolutionary medicine cert for these people and understand functional medicine and all that.

That's part of what Kirk and I are working on is trying to get a program where we can educate everybody from trainers to physicians and researchers in this stuff and not by any means that we have all the answers but here's at least a starting point.

Here's a place to start. Here's some current understanding on this stuff which seems to be way beyond where everybody else is and let's kind of go from there.

Dr. Kirk Parsley: Here's a template if you want to approach it from our way because honestly you can come at it at so many different directions and I'm not saying we're smarter better than anyone else but my way works for me. So if you want to try my way here's my way. I think what your listener is saying but I think that there's no... I have a hard time envisioning a solution that doesn't require...

Robb Wolf: Medical intervention and just detailed number of track and all that.

Dr. Kirk Parsley: You're going to have to treat the snowflakes individually and we'll get their labs and talk to them specifically about their issues which is going to require a network.

[0:40:00]

We can make approximations here by giving these people non medical advice just so you generalize advice to point them in the right directions and other people can have some more things and soon they're having similar problem. But how many things look like metabolic syndrome or type II diabetes-like just because you're feeling lethargy and having body composition issues and maybe you should start taking Glucophage.

A lot of this stuff looks like there's a lot of overlap between your goal and it's really hard to get super specific even with this really well-written questions you guys get. I suspect that it's just gonna have to get something frank medical network not necessarily physicians but the a true out world template, and maybe there's an advisory panel for people that we serve to go to get answers or something.

Robb Wolf: Cool. So I guess part of this diversion here that just pops in my head. It's just kind of asking all you guys is it worth it for you week after week to listen to, let's say, kind of the same questions.

Dr. Kirk Parsley: Sleep well, work out, eat well, go see a functional medicine doctor.

Robb Wolf: Seems incredibly repetitious on my side of thing. But if you guys still like it we'll keep doing it. I'm just curious. Let's see here. Steph, "Hi there. Thank you guys so much for everything you do." Wait, we did this one, right?

Dr. Kirk Parsley: No, this is the migraine.

Robb Wolf:

Oh, I'll read this one. There's some thesis stuff in here. "I've been a 100% paleo for over a year now and this changed my life. Like many people, I found my way to paleo when I was at my wit's end with a chronic health problem. My key is debilitating migraine headaches that lasted 7-10 days, with maybe 5 days in between. I used triptans, imitrex, etc. to control them, which caused an endless rebound cycle.

"After switching to paleo and going cold turkey on the pain meds plus adding a lot of home high-intensity interval training to my routine, I'm down to an average of 1 migraine in a month, typically lasting less than 24 hours. I discovered that 35-40 minute hard-ish workouts, 5k run, 40 minutes of moderate-intensity of rowing can often drive the headache away completely although not always, which seems extremely weird.

"A doctor in Johannesburg, Elliot Shevel, says that migraine pain is caused by dilation of the extracranial blood vessels, which accords with my experience of tempering the pain with a super-tight bandana around my temples. That's interesting?

"Sorry about the long intro but what I would like to know is can you tell me anything about the impact of adrenaline on dilation of blood vessels. The migraines I do have seem highly contingent on bursts of adrenaline - an overly intense workout, a close race at my masters swim club, a badly stressful day at work and are clearly tied to a lack of sleep as well. Then there's the estrogen connection. I'm far more prone to migraines the week of my period than any other time.

"I would give just about anything and believe me, I have given this some thought, 10 IQ points, my left foot, my eyesight for 5 hours a day to find a way to shot the headaches off entirely. Can you suggest what the physiological processes are that create the pain and how to avoid it? Thank you so much."

Dr. Kirk Parsley:

Yeah. Nice.

Robb Wolf:

A bunch of fun.

Dr. Kirk Parsley:

I see a couple of things in there and I'm glad that you're in that because I don't know what HIIT was. I'm thinking man, I must have slept through that day in medical school.

Robb Wolf:

It's because Dr. Parsley is incredibly fast switch-like ending over 10 m ends up getting his heart rate in the dangerous red zone.

Dr. Kirk Parsley:

A few things that stand out to me definitely approach the hormones. Estrogen is well correlated with migraines and it's the estrogen drop in the cycle that causes migraines. What she's talking about earlier though it makes perfect sense to me that her running, what she thinks seems counterintuitive but there's a couple of things that could go wrong there.

One thing is that obviously exercise actually decreases blood flow to the brain, that's why you're not as smart when you're working out because you don't have so much blood flow. If you're exercising intensely your limbs need it. So decreasing blood flow in the brain can be causing some of that and also just the endorphins that are released, not to mention just straight serotonin that's gonna be incurred with her joy of working out. It seems like something she really enjoys a lot.

So I'd say endorphin release, the decreased blood pressure, decreased blood flow to the brain is probably where she's getting the relief from.

[0:45:00]

That's a very admirable way about going about it. If you could run with your migraine, more power to you, but I can tell you probably just like a very low estrogen on a continuous basis depending on how old you are, what's your fertility concern are, if you already had kids, do you want kids, blah blah blah.

Or you're on birth control... if you're on birth control and you're on a multiphasic pill which kind of rises and falls. So get on monophasic and just keep your estrogen... you could keep your estrogen constant throughout the month, I would say 99% chance that the migraines are gone. I'd give that a shot first and then keep trying to handle everything that she can through exercise.

But there's the physiological process that I think it leads to. What's leading to the pain itself obviously is that expansion essentially puts pressure on the areas intercranial that your body doesn't want. The lining over your brain, it's sensitive. Your brain isn't sensitive but your body is meant to be able to register if something's going on in your head.

There's something going on when the vessels are expanded and putting too much pressure on certain areas your body's perceiving that as a problem, trying to get you to quit doing whatever you're doing that cause that.

Robb Wolf: Maybe biology figured it doesn't need pain sensors in the brain because by the time something happened to your brain, it doesn't matter anymore.

Dr. Kirk Parsley: By the time we're in the white matter the battle's lost.

Robb Wolf: So Doc, help me with this. She seems to see an increase in pain post adrenaline release. Adrenaline's going to be a vasoconstrictor, so are we just seeing a rebound with that? Do we see vasoconstriction, vasodilation? Is that part of what's going on you think?

Dr. Kirk Parsley: Well, it's hard to say when we're talking about the neurological tissue the main effect of the neurotransmitters is to change the polarity of the cells. The neurotransmitters become, well I should correct myself in case there's a neurologist listening – I'm talking about neurotransmitters that are now acting as neuromodulators.

If I'm sending signal from one neuron to the next neurotransmitter, if I'm affecting how much chloride or calcium a neuron has in it by using that same chemical as non neuromodulators, we're talking about neuromodulation. By epinephrine/norepinephrine or both obviously neuromodulators in the brain, you're come from the locus coeruleus, you're way down in the circle of your lizard brain. That is then affecting the membrane potential of her neurons. Some of those neurons are what is causing her to feel pain.

If we're hyperpolarizing things that should be inhibiting the pain or if we're depolarizing, nearly depolarizing along the threshold potential of things that will trigger pain, then she's found to be more susceptible to pain once those neuromodulators go off and then the ion channels start opening back and forth. That's my estimation of why she's feeling that.

Also once her endorphin rush goes away, the endorphins work the same way. Endorphins and neuromodulators, once that goes away, who knows what milieu you're left with as far as what neurotransmitters are still there. I noticed that, like I said, the hormones affect what's going on in her brain as well. I think the real trigger is the hormones. It's the estrogen.

Robb Wolf: Let' see here. Meesha. "With all this degradation, why do medical professionals still work 12-hour shifts and 12-hour night shifts? I think I've heard that some shifts may be even longer. Are there studies that show that fewer shift changes have the greater impact on reducing

human error than shorter shifts? What in your opinion would be a good patient care model as far as shift length?"

Dr. Kirk Parsley: Yes. Well I don't even have to give you my opinion on this because the researches are very very obvious. Error rates increase drastically... after 10 hours, they start increasing but they're drastically increased after 12 hours which is the reason for the 12-hour shift. It's the excuse for the 12-hour shift. The reason the shifts are long is sheer more humanity. That's the way we've always done it.

[0:50:00]

Just like being in the military or something. Why do we march? Why did I spend 8 weeks of my life learning how to march? When's the last time anyone in the navy has marched into a battle? If it's ever happened, it will be remarkable. It's a traditional thing. It's getting your come uppance and it's why surgical staff treat their residents like crap. It's kind of this initiation period. There's no good logic behind it.

It's a huge problem. There's a great YouTube video, I'm blanking on the guy's name, but search YouTube for medical errors. It's only about an 8-12 minute speech on that, it's a Canadian doc, but it's great. There's great data. We kill at least a 100,000 people a year by medical mistakes and that's probably gross underestimation. We make 4-10 times that many mistakes and of course doctors have to make mistakes. They're human. But we know that people make a lot more mistakes when they're sleep-deprived.

The 12-hour shifts, there's no reason other than financial incentive to have your doctors to be able to cover, fewer health providers to be able to cover the same amount of time. There's no learning benefit from it. There's no benefit to the patient. Talk to the hospital administrators and the ACGME and those types of people because I could promise you that most doctors would prefer working 8 hours a day over their 12-hour shift. Oftentimes, during internship and residency, you're up every third night. You're staying up all night.

As you heard me saying some of my lectures, you're performing like you're drunk. Absolutely, neurocognitive testing will show you exactly so you're drunk, especially when there's no adrenaline in there. So doing something really boring like writing orders or notes, your error rate is astronomical and you know it yourself because you come in the next morning after you'd slept and you're like what the hell was I thinking with this? This is the wrong patient and I misspelled this. It's a really bad idea.

I agree with Meesha. It is dangerous, it's a bad idea and I think if I were king of the world, I would say a 9-hour work day with 1 hour of that to have a lunch or a walk or a short nap about half an hour nap or whatever and go from there. That's the way I would run it if I were king but I don't think they're going to be let me be king.

Robb Wolf:

If there was one argument that I could have for the longer shifts, my mom's been in the hospital and I have talking with her on the phone a lot and she's in a place that there's some really good care but I will say whenever there's a shift change, there's a certain loss of information, certain loss of continuity.

I don't know where that factors out though. So the new person comes on shift to take some a little while to get up the speed and kind of understand what's going on. Is that a lesser or greater concern versus having somebody that's still been on shift with their functioning and impaired sleep-deprived state?

Dr. Kirk Parsley:

What we do in my current clinic, we provide care 24 hours a day. Obviously we don't need to do most of the time because we have a healthy population by and large. But essentially, if they're my patient, I become their case manager and I know everything about them. I keep the best notes that I can in the EMR. I discuss/communicate to my colleagues what's going on.

A hospital's bigger, obviously more people involved, especially if it's a teaching hospital with students and residents and so forth rotating through services. But I think it could all be handled by – let's essentially have a case manager. That case manager doesn't have to be a non-provider. It could be a provider, it could be a non-provider, but let's have a case manager who knows everything about this patient, who can convey salient operation to whoever need it.

I think that's the solution and that person works whenever 9-5 and if there's a question afterwards, I got to call that guy and he wakes up in the middle of the night to answer a few questions. But I think that's a better solution than having fatigued people, honestly, you, remember the one lecture I gave where I kind of gave the batting average thing.

[0:55:00]

You're about to have an open heart surgery it's good news if you're batting at 400 this year. You have 60% chance of dying but 40% chance of living.

That's kind of this along I continued from here for 12-hour shift. You guys fatigue but he handles fatigue pretty well. He did it for a long time. He's probably worked a little longer than he should but don't worry about it. You're gonna get good care. We want him to know what's going on instead of you helping to get that information from someone else. Communication could be handled. Look at the communication in the world right now.

Robb Wolf:

I like it. Let's see here. from Saul, "Hello Robb, Gregg and Doc Parsley. Love the podcast. Sincerely thank you guys. I'm 31, 5'10, 270lbs, 10 year police officer, 8 years on night shift, type II diabetic since age 25, diagnosed with membranous nephropathy at age 28, A1C normal to normal high last years, no more protein in urine for a couple of years now. I began to suspect and got tested for low testosterone among other symptoms.

"My progress stalled my strength, muscle gain, and fat loss even though I worked hard on my diet, strength and conditioning. Free testosterone levels was 280, the first time 340. A few days later and doc was satisfied and took no further action. I understand why it is low given my medical history, sleep, body fat levels, etc after looking into the dangers of low testosterone and the benefits of TRT I wonder if testosterone placement therapy clinic is a good option for me.

"Might this be the missing link for me to reach a healthy body fat percentage and improve all my other related symptoms? I know I have to keep eating paleo, lifting heavy, working on fat loss and bide my time until I can get off the graveyard shift, but is TRT right for me and for how long? Is there coming off of TRT safely or does it have to be permanent? Should I go different route altogether? Thanks for any help."

Dr. Kirk Parsley:

Yeah. Unfortunately we don't have his age in there.

Robb Wolf:

31.

Dr. Kirk Parsley:

Oh. So he's 31 and he has a testosterone of somewhere around 300 which is abysmal. There's no possible way that the substantial amount of his metabolic regulation isn't coming from that. I would say there's almost no chance that that wasn't gravely accelerated if not completely induced by his chaotic sleep cycle and sleep deprivation.

You cannot completely accommodate two overnight working. The shift work cannot be 100% accommodated here. Some people can handle better than others; 31, honestly, is still a very young guy, 8 years of shift work, he's 10 years older physiologically essentially.

There's a great article. I would take this to your physician. I'm sorry I don't have anything in front of me on it but the chairman of UCLA Endocrinology, Schofenfield, Schofenmeyer, something along those lines, has actually done an age adjustment, age stratification for testosterone. For his age group, total testosterone should be somewhere on 734-736. He's not even halfway there. Definitely, he needs help with testosterone.

Does he need testosterone? That's the question. I don't know. There's lots of ways to get testosterone up without using testosterone. Being 31, I strongly suspect he could get his testosterone back up without testosterone. Maybe give a testosterone tapered or be getting just the kind of – get an immediate symptomatic relief, give him some motivation. That will definitely help with his insulin sensitivity issues. That will definitely help with the body composition. That will help with his ability to handle that short cat sleep.

What was his last question there? Coming off safely, like I said, I think you could probably get away without testosterone then there's no problems coming off. If you need testosterone because your testicles fail to be stimulated by hCG or something along those lines, if you can't get your testicles produce enough testosterone then you have to have testosterone.

You're 31 and you still want to have kids, then you need to cycle long enough. There are ways to do that, lot of protocols that are very simple effective one where you can maintain good testicular volume and fertility and all those type of things.

[1:00:06]

No, you shouldn't permanently need it. I think there's almost no chance of permanently needing it at 31. However, with his type II diabetes since 25, maybe there's some sort of genetic game there that his testicles really have shut off and what would be the cause of that I can only speculate on.

Robb Wolf:

So pretty good assumption, high body fat levels so that testosterone that is being produced right now is getting converted into estrogen and like

you mentioned in the last show, the brain has this funny game that it's played.

Dr. Kirk Parsley: True just for men. It's just meant to make us miserable.

Robb Wolf: So it doesn't. All the feedback loops are tied to estrogen levels and I'm sure most of the listeners are familiar that adipose tissue has this stuff called aromatase which converts testosterone into estrogen. That's kind of the double whammy in this, in another piece of the information that needs to be tracked, sex hormone binding protein, estrogen levels. Because even if you start pushing up the testosterone levels, you may end up pushing up estrogen levels and then you end up in this feedback loop.

Dr. Kirk Parsley: Absolutely. In anything that he does to stimulate his testicular production and I should involve an anti-aromatase, especially the diabetes and the body composition. Just putting an anti-aromatase on him might solve 50% of his problem. And yes, do that forever, 2 pills a week. \$2 a week for the rest of your life, you can probably handle that.

That might be the endgame for him once everything gets back into place but I would say definitely find somebody smart in that if you live in San Diego you can come to me. But wherever you are, I'd find somebody really good in that. I wouldn't go super aggressive. I'd find somebody who's willing to be conservative and help me do round stimulation.

But I think the line share his problems. He gets that back in order, estrogen down and as you say says sex hormone binding globulin down, DHA, high pregnenolone high testosterone, high DHT, moderate to conservative level, most of his problems are gonna go away. Insulin sensitivity is gonna be quadruple. His sleep will get better which will improve his insulin sensitivity even further and his testosterone production will improve even further and his growth hormone even further. Lots of ways.

Robb Wolf: Cool. Let's see here. Paddy had a good one. Short but good. "Hi guys. Thanks for all the work you do. Ironically I fell asleep during the first episode with Doc Parsley so apologies if this has been addressed." Cool stuff.

Dr. Kirk Parsley: That's why I do it. That's why I'm a sleep doctor. I put people to sleep.

Robb Wolf: That's right. "There seem to be two schools of thought when it comes to sleep. One says establish a routine, go to bed, wake up at the same time

everyday. The other says sleep when you can, this includes naps and sleeping in on the weekends. If you're only sleeping 6-7 hours a day which strategy would you recommend?"

Dr. Kirk Parsley: Both. If you're only sleeping 6-7 hours a day, your sleep is too short and there's an endless amount of threats I could make for what's going to happen to your health and your performance and longevity and all those stuffs and things with short sleep.

But if your problem for short sleep is because you cannot sleep, as opposed to just not having enough time for sleeping and not prioritizing enough to sleep a long enough time, then waking up the same time everyday is the way to get back into good sleep. You actually sleep-restrict yourself but you wake up the same time everyday. If I have to get up at 6am, say if I'm going to get up at 6am and I'm having insomnia problems, my short sleep is caused by not being able to sleep well.

But I have get up at 6am the first night of the sleep restriction, I go to bed at 2 am and I have to get up at 6am no matter what. Of course I'm a piece of crap the next day. This is best done maybe Friday and then as long as I sleep all the way to the night fine I'll be tired. My body would be ready and then I can extend it to 5 hours and then 6 hours and then 7 hours so long as that I'm always going to sleep within 20 minutes of getting in bed and then I'm waking up at the same time everyday.

If you start sleeping in on the weekends and start shifting that around, that whole game gets thrown off. If you're trying to get with a phase shift which is the most common cause for this, that gets thrown off.

[1:05:00]

But good sleep hygiene at night, sleep restriction, progressing that to normal sleep duration, some bright light therapy in the morning, loud music, exercise stimulation to get your adrenals skipping in the morning, maybe some adrenal support, low doses of DHA, all those types of things if he needs to improve his sleep. If it's a priority issue, then get your priorities in line. If you're not willing to do that then sleep as much as you can.

Robb Wolf: At some point you have to turn off Game of Thrones and just go to bed.

Dr. Kirk Parsley: It really is just a brass ring. When you get it, you're gonna be disappointed. It's just a brass ring.

Robb Wolf: Cool. Let's see here. How far long are we? Do you want to do one more?

Dr. Kirk Parsley: I can do whatever you want. I don't think if we can bore the listeners to death. How long have we been going?

Robb Wolf: We've been going close to an hour so let's see here. That one's really long.

Dr. Kirk Parsley: Let's do this.

Robb Wolf: Sorry, guys. We're fishing through the questions. We had some good ones and we had some good long ones.

Dr. Kirk Parsley: This guy, Dan, wants to know – what basically he's exhausted his adrenals....

Robb Wolf: I think we might be good. These are a little bit repetitious off of what we already did?

Dr. Kirk Parsley: Dan, we have the same answer for you. Karen, your husband has some metabolic issues. He definitely needs to get his hormones checked out, metabolic markers followed and all that stuff. That would get rid of a lot of his issues. The Marine Corporations guy who can't do enough pull-ups, there, that's yours Robb.

Robb Wolf: Yeah, do more pull-ups.

Dr. Kirk Parsley: Do more pull-ups and you handle the pull-up then I think we're about done there.

Robb Wolf: The question on the Marine Corporations deal was, the guy – very long.

Dr. Kirk Parsley: Real quick. I have a quick answer. For a lot of people have this question, the Seals are terrible about this. If you do not sleep well, suffering from insomnia should workout the next day? No. You can exercise but you shouldn't do anything that resembles something that's trying to make games or extremely – just movement. That can incorporate weights if you want me but there's should be no fatigue involved, anything that would cause adrenal stress. Pull-ups are yoars and I think we're good.

Robb Wolf: There was a super long, very detailed question on the pull-ups but really it all boils down to the guy's at 20 pull-ups wants to get 25 what do you do? Pavel Tsatsouline had some pretty cool thing that he would do for strength endurance which was basically, let's say, your max pull-up is 20

and so you would do multiple sets, as many sets as you could day-to-day of about 10-12 pull-ups. I would do that, try to build as much volume as you can and then once a week, try to do like eat by 3, 10 by 2, heavy pull-ups in the 100% range. What do we got there?

Dr. Kirk Parsley: That's the 6-pull-up guy.

Robb Wolf: Oh the other guy's 20.

Dr. Kirk Parsley: I think it's the same answer. This guy looks like a beast with everything else he has going on.

Robb Wolf: Also for Brent, quit eating the zone. We haven't had a weight measured zone question in here for long time. Part of your problem maybe is that you're under-eating, so go out on a wild-limb saying that. Sweet. Doc, anything else? Any projects going on? If somebody is in, the Southern California area needs to track you down, where do they do it?

Dr. Kirk Parsley: Life Wellness Institute, San Diego. You can Google this, get in touch with my staff there, see if it works out for you if you need to come by. Otherwise, these guys if they have questions they can ping me. Squatchy?

Robb Wolf: Yeah, that's Squatchy.

Dr. Kirk Parsley: Squatchy has sent me a few questions. I respond to emails when I can, still working on getting a website launched and the ebook finished and the lecture series. I have a full-time job by the way, three kids, wife and all of that. So yeah, I'll do what I can to help anybody but just realized I might not be a hot channel.

[1:10:00]

Robb Wolf: We'll put a link to the clinic and show notes so people can track you down that way. Guaranteed we'll have you back on here before too long. Assuming we'll keep doing the podcast if people still want to hear us.

Dr. Kirk Parsley: Your answers here just on the side...

[Cross-talk]

Robb Wolf: We're good, actually. Why don't you guys close it down?

Dr. Kirk Parsley: We keep listening for new information and you don't have any. Why don't you move on?

Robb Wolf:

We thought that if we quit listening, it would hurt your feelings. Awesome. Well, thanks Doc for being on the show and hopefully the talk tonight goes well and we'll talk to everybody soon.

[1:10:37]

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