

Nicki: It's time to make your health an act of rebellion. We're tackling personalized nutrition, metabolic flexibility, resilient aging, and answering your diet and lifestyle questions. This is the only show with a bold aim to help one million people liberate themselves from the sick care system. You're listening to the Healthy Rebellion Radio. The contents of this show are for entertainment and educational purposes only. Nothing in this podcast should be considered medical advice. Please consult your licensed and credentialed functional medicine practitioner before embarking on any health, dietary or fitness change. Warning, when Robb gets passionate he's been known to use the occasional expletive. If foul language is not your thing, if it gets your britches in a bunch, well, there's always Disney Plus. And are we live?

Robb: I think we're live. We're not dead yet. Not dead yet.

Nicki: Not dead yet. Welcome back to another episode of The Healthy Rebellion Radio. What do we got today babe? Well actually today ... Today's Friday. This episode's releasing and we have our kickoff call for our 30 day reset today. So we will be kicking that off here in a few hours and then the reset officially starts on Monday. And as we've mentioned in previous episodes where we tackle the four pillars of health, food, sleep, movement, community, community in the time of Covid this go around.

Robb: Yes.

Nicki: And yeah. So if you're interested in jumping in on that, folks need to join by Monday the 20th because we do start everybody together and go through it together so there's no stragglers in this one. So, you can join at join.thehealthyrebellion.com.

Robb: Sweet. Super excited for it.

Nicki: Yeah.

Robb: Excited for today's show with Doctor Jaime Seeman.

Nicki: Oh my goodness. This is a good one. But let's not ... No, we're not going to get there yet. We've got a few housekeeping items to do.

Robb: Okay. Okay.

Nicki: Well, I guess the other housekeeping item that we normally do is our new topic today.

Robb: Which, it's a review article looking at both interventional trials and also epidemiology considering vitamin D status and ones' propensity for both influenza and Covid infection. It paints a picture that I think is reasonable that there's probably a U shaped curve around vitamin D status and a good number of nutrients probably have a U shaped curved where too little is a problem, too much could be a problem and then there's kind of a Goldilocks sweet spot there which will vary from person to person. But it almost uniformly ... At the Reno clinic we just halted doing vitamin D testing because literally everyone was deficient.

Nicki: Everybody's low?

Robb: Yeah. So it was an expensive test. It's kind of nice to have a benchmark but it was so incredibly rare that somebody had adequate levels that we were just like okay, you're low, start supplementing and maybe we'll check it out later.

Nicki: And this is just because most of us spend most of our time indoors.

Robb: Way too much time inside and then when we do go outside we put on sunblock and yeah, yeah.

Nicki: Yeah. Okay. Well, I guess we'll ... Well we supplement with a little bit of vitamin D.

Robb: We do a little bit here and there. Particularly in the-

Nicki: In the winter months.

Robb: Darker period, yeah.

Nicki: Yeah.

Robb: Yeah. And then kind of wean off that in the summer.

Nicki: And that link to that article will be in the show notes as always. And our T-shirt review winner this week goes to T Plamontay. He or she says, "I came back. I was one of Robb's six listeners for years and then for whatever reason, I didn't keep up with the podcast. That said, laying awake somewhat anxious about this Covid pandemic, I remembered how great always was at not just making diet and exercise clear, but at sorting through other big murky cultish subjects like politics and sex. So I went and found this podcast and I've been binge listening all day. The information has been great and helped me feel a little more in control of my life at least for today and possibly might convert me to keto even though that's not truly why I'm listening." T Plamontay thank you for your review. Shoot us an email over to hello@robbwolf.com with your T-shirt size and your mailing address and we will send you a Healthy Rebellion Radio T-shirt.

Robb: Awesome.

Nicki: This episode of the Healthy Rebellion Radio is sponsored by Athletic Greens. Athletic Greens is an ultimate daily all in one health drink with 75 vitamins and minerals and whole food sourced ingredients. And it also includes prebiotics, probiotics, digestive enzymes, adaptogens, super foods and more. And Athletic Greens is trusted by some of the world's top performers, entrepreneurs, athletes and Olympians. And it's super easy to use. It comes in powder form. You can just scoop and mix with water. They also have little individual packs. Also easy. Grab and go.

Robb: Yeah. They were one of the earliest folks on the scene doing this, so yeah.

Nicki: Yeah. They've been around for quite a while.

Robb: Do it well, been doing it a long time.

Nicki: And it's fine for keto adherence too. That the carb content is-

Robb: If you're carnivore then those evil plants. I don't know what to tell you there. Maybe it won't fit with carnivore. Yeah. You never know.

Nicki: Yeah. You could give it a shot.

Robb: No, it will kill you. If you're eating carnivore, taking Athletic Greens will kill you.

Nicki: Oh man. Well, they do have a special offer for Healthy Rebellion Radio listeners. You can go to athleticgreens.com/wolf and receive 20 free travel packs with your first purchase. These travel packs make it easier to cover your nutritional bases while you're on the road. Even if you're not in the air on a plane these days, you might be going and taking a road trip to somewhere beautiful doing something nice during these times.

Robb: Going somewhere, doing something. I like that. That's very specific.

Nicki: Right. All right. Now we can get into the topic of today's show, which was a guest interview that we did with Dr. Jaime Seeman inside the Healthy Rebellion probably six weeks or so ago. She's a functional OBGYN and she goes by the handle @drfitandfabulous. She spoke at Metabolic Health Summit and it was like standing room only. People absolutely loved her message. And members of the Healthy Rebellion who watched the video loved it and I just wanted to actually read a couple of comments that were on that video thread. One gal said, "I loved this interview. I wish she was my doctor. She's so knowledgeable. I'll be sharing this video with my teenage daughter." And another woman said, "I loved this interview. Thanks for arranging it. Jaime's explanations and information on various topics was so valuable for all women, especially my daughter-in-laws and granddaughter." So Robb, we had members submit questions for this interview. So we had women that had different questions on can keto affect when perimenopause or menopause occurs? When should we get our hormone levels checked? What about post menopausal women who can't sleep and don't want sleeping medications that the standard doctor is prescribing? Birth control, IUDs, PCOS, C-sections. It ran the whole gamut.

Robb: Comprehensive. Yes.

Nicki: It was a great, great interview, so I think you all will enjoy this and this is one to share with all your female friends. So anyway. Without further ado, let's jump into the interview.

Robb: Dr. Seeman, welcome to The Healthy Rebellion.

Dr. Seeman: Thanks for having me. I'm excited to be here.

Robb: Huge honor to have you. We surveyed our folks and asked them, who would you like some expert interviews from and your name came in like an absolute avalanche landslide, only person running. So you were super popular within the followers.

Dr. Seeman: Oh.

Robb: Yeah.

Dr. Seeman: I must have paid them off well.

Robb: It's always good to get that done upfront. Do you have aspirations for a political career at some point?

Dr. Seeman: No. 100% not.

Robb: Me neither. Not even like a parent teacher association board or anything. I have no desire for that.

Dr. Seeman: Nope. Not at all. Not at all.

Robb: Hey doc, so it's interesting. Over the course of time the questions that I receive have shifted and I would say maybe 40 to 50% of the questions that I get are career oriented. Like, should I be a dietician, should I be a doctor, should I be a physician's assistant? And I'm always perplexed about how to answer that. Because I think like, whether you're an introvert versus an extrovert, what type of risk tolerance folks have. If you're okay with a lot of risk then doing some of these more alternative tracks can clearly be an option. If you're not so risk tolerant, then doing something a little more mainstream could be more appropriate. Could you detail a little bit of what your ... You have a really eclectic background. But what brought you into medicine? Why did you choose being a doctor versus the whole host of other options that we have out there?

Dr. Seeman: Yeah. That's an interesting question. Not something that I actually get to talk about a whole lot. But I grew up ... I'm born and raised in Nebraska. I grew up as a little girl. My mother was a nurse growing up. And early in her career had very strong leadership skills and got into healthcare administration. So I grew up in a household with ... My mom was kind of my hero and she was the breadwinner of our family and I always thought I was going to be a teacher or a nurse. And that was just because as a little girl watching my mom. And it was actually my mother that said, "You know what, if I had to do this all over again, I probably would have just went to medical school." And it was kind of this awakening in me because I always just thought ... I grew up kind of in that paradigm of like, girls were nurses and boys were doctors. And so I went to college. I was a collegiate athlete at the time and I was on a pre med track. And all I could think about was going to medical school.

Dr. Seeman: But college was the first time that scholastically I was really challenged. High school was super easy for me. I got straight A's. I didn't try very hard. And then here I was in college really having to study a lot to kind of earn my keep per se. And my freshman year of college they ended up getting rid of my degree program. It was kind of this ... They had downsized and fired a bunch of people in the college and so I thought, oh my gosh, what am I going to do? And I actually went half a semester changing my major to broadcasting and I thought, forget this, I'm going to go be a news anchor. So you can kind of see my personality. I love being in front of people. I liked teaching. I had considered teaching and then I was like well, maybe I'll do broadcasting. Well luckily, the college got things together and kind of took what was left of the exercise science program and combined it with the faculty from the nutrition program. So I was one of the first people to graduate from the University of Nebraska with a nutrition exercise science, like a combined degree. So it was nutrition exercise science and health sciences.

Dr. Seeman: And so I kind of got the best of both worlds with the faculty of exercise science and nutrition. Which for being a pre med track was very different. Most of my colleagues had chemistry degrees, biology degrees, biochemistry degrees. You know, you name it. But I really thought to myself, what if I don't get into medical school? What the heck am I going to do with a biology degree?

Robb: Right.

Dr. Seeman: I didn't have any desire to be a basic scientist. I really wanted to work with patients. And so luckily I graduated with this degree and got into medical school, but I didn't really know what kind of doctor I wanted to be. I thought maybe I wanted to be an emergency medicine doctor because I really loved fast pace and procedures. But as I got through my studies I realized how much I loved the operating room. I loved working with my hands. It was very satisfying for me to complete an operation. At the end, look at your incision and think of all the amazing things you did underneath there. And I did like continuity. So I liked meeting patients from the beginning and following them all the

way to the end. So definitely emergency medicine was out. And then I kind of discovered this world of obstetrics which was this small little pocket of happy medicine where it wasn't the doom and gloom of diabetes and heart disease and all these things. And what's interesting is I have this background in nutrition and exercise but we don't learn a ton of nutrition or applications of it. We just say, oh, well you have a medical nutrition therapist on your team. You kind of refer out to all these other experts when you need services like that.

Dr. Seeman: So after medical school is when I got out into practice and I realized how valuable that information really was. That there was all of these things that we were treating medically that we could have prevented. And we don't talk a ton about prevention. We talk about identifying the disease and here's the treatment or the drug or whatever it is. So that's when I really started to get into what I would consider functional and integrative approaches with my background. I'm finishing my fellowship now in integrative medicine and in my obstetrics and gynecology practice, it's very unique to my world. Everybody messages me on social media and says, "Is there a doctor just like you in New York and in Dallas and LA and all these places?" And it's just very unique background that I have in my world. And so now, I'm board certified in ketogenic therapy and I work big time with nutrition with all of my patients. So my track is a little bit different. But kind of back to your original question, we need people in the healthcare space. This is not anything that's going to go away. This is a great field to be in because we will need doctors until the end of time. But I am starting to see kind of the shift in the world where people are tired of our current healthcare system.

Dr. Seeman: There's a small growing population of people that are interested in prevention. We still have a lot that aren't. That would rather just take a pill. Which is super exciting for me. And I'm starting to see even as healthcare providers, people's minds are opening to what we've been doing for a long time and how it's not working. So this is a scary time but also a very exciting time to kind of be on the forefront of the changes that we're making in the healthcare system. But there's lots of different rolls to play and I think you're exactly right. It depends on, how much are you willing to spend? What time are you willing to give? Because medical school was greater than a \$200,000 investment for me in my education, which is a huge financial burden to take on. It was a lot of time as far as making sacrifices away from my family. Lots and lots of hours of studying.

Robb: It represents somewhere between like 10 and 20% of our total lifespan.

Dr. Seeman: Yeah.

Robb: Yeah.

Dr. Seeman: I know. I mean I look at some of my friend that went right out into the workforce and here I was like in my 30s. I didn't have any sort of retirement plan. No 401K. I had a huge amount of debt. And socially I had given up many, many, many years. And when my kids were babies, I kind of joked that my husband changed more diapers than I did. I look back, like how did we get through it? And really it was because I had a great partner at home that was also making lots of sacrifices too. So it's not anything to be taken lightly. It's not a walk in the park to enter this field. And then now, here I am on the flip side of it and people are mad at doctors and doctors have an invested interest and it's just about the money and they're getting paid by big pharma. And it's like, oh my gosh. What a time to be in this. So there's roles for everybody. Whether it's getting a nutrition degree or whether it's being a physician assistant or a nurse practitioner, we're seeing a huge, huge growth in our mid level practitioners, nurse practitioners and PAs as our burdened medical system is really allowing them more freedom and we need providers

like that, especially in the primary care world. So, there's room for everybody to come help fight this fight. That's for sure.

Robb: Yeah. We're probably not going to find ourselves with no career options trying to solve obesity and all the other metabolic driven diseases. Yeah. This is super speculative. We're early in this Covid outbreak, but some of the early data that's coming out suggests that the folks that are faring the worst in addition to age, but it looks like metabolic underlying issues. From type two diabetes, hypertension, systemic inflammatory conditions. These things are really driving the most negative outcomes and do you feel like there's going to be an opportunity on the back side of this to really rejigger? Like we need to address the food system and get back into the institutions of dietetics and say hey, is the basic recommendation that we're making which is, everything in moderation ... Which I think from an evolutionary biology standpoint makes absolutely no sense at all. But what do you think the opportunities here are with this Covid pandemic and then being able to revisit these broader public health questions?

Dr. Seeman: Yeah. I think it's a great point that you bring up but I don't know that it's necessarily something that Covid has uncovered. In my world of obstetrics, I talk pretty openly about the fact that the pregnant patients that we take care of these days are unhealthy and we have this rise in maternal mortality and we're seeing increasing rates of preeclampsia and gestational diabetes and things like that. And it's because women are coming into pregnancy with underlying metabolic disease. So it's not even just Covid-19, but people are getting unhealthy at a much younger age. And although the average lifespan might be the same, our health span is definitely shortening. So I think as we get published data from Covid-19, of course it's always helpful to have papers and to have data to back you. But I think that it is really kind of unmasking the fact that we have And it's coming out in America that we're seeing a different population that's getting sick. When you look at Italy, they have a really large elderly population so it's not surprising that they've had the death rates that they've had because they have a very, very, very high proportion elder population. But in the US, we have a very high proportion of younger patients with metabolic disease.

Dr. Seeman: I've been talking to my colleagues across the country and we are seeing young people that are critically ill and young people on ventilators and it's due to the fact that on the inside, they're not healthy enough to be fighting this type of disease.

Robb: Right. Yeah. It's going to be interesting and I think it's something that I've seen folks in the United States kind of downplay the significance of how bad this could be for us. Because we look at some other places where the populations are just either healthier or sick in ways that we are not sick and may not lend itself to the really catastrophic outcomes that we could see here. So it's going to be interesting how that goes forward.

Dr. Seeman: Well and then what we've done is we've done is we've shoved everybody inside their houses with Pop-Tarts and Oreos and all this stuff. Yeah. I don't know. It's a scary time. What are people willing to do? Basically you get what you tolerate and so, I think this really is going to be a time where people have to ask what they're willing to invest in themselves.

Robb: Right. Absolutely. Well hey, we have a very savvy group of folks over at the Healthy Rebellion. Much smarter than I am fortunately. Which is the reason why that thing motors along pretty well. And they put together some great questions and I wanted to dig into a few of the questions. This one's from Victoria and she said, "When to check

hormones? Question to Dr. Jaime. What age does she recommend to check hormones, especially estrogen? As per my doctor I'm two young at 37 years old."

Dr. Seeman: That's a great question. Because when we look at hormones across a woman's lifespan, there's really only a few times that we're really checking them. And a lot of times it's related to infertility workups or if there's dysregulation of the menstrual cycle. So for most women, your doctor might say, well you don't need to check them because they might be having a normal menstrual cycle or they're not having any symptoms or something like that. But, the reason that it's hard to just check your hormones ... Like you know you go in for an annual exam and you get your lipids checked. The reason it's hard to just check hormones is because the hormones change not only on a daily basis but on an hourly basis. Really our hormones are tied to our circadian rhythms. So in people who are kind of in their years of fertility, it's very cycle specific. Like what day of the cycle are they to interpret these types of things? And if I check it on the third day of your cycle this month and check it on the third day of your cycle next month, they could be completely different. So it's hard to get an overall picture just by checking hormones on just kind of a one time snapshot basis. So that can be sometimes why providers are like, why do you want to check your hormones?

Dr. Seeman: Now the other thing that I want to address with this is that, the kind of million dollar question people ask me is, "Dr. Jaime, how do I balance my hormones?" But they have to know that there's basically five pieces of the puzzle. So we talk about nutrition a lot in my world. But the other pieces of the puzzle are sleep, stress, environment, and exercise or movement. And so all of these things can affect your hormone levels. Now the menstrual cycle is basically like a vital sign for women. Having a normal menstrual cycle tells us that your body perceives that this is a good time to reproduce. And it tells us that things are probably going pretty well. But if you have dysregulation or absence of the menstrual cycle or you are having other hormonal symptoms like acne or thyroid issues or things like that, then it might be a good time to check them.

Dr. Seeman: I find that in our current healthcare system, you might get more answers working with a functional or integrative provider. Not necessarily just an OBGYN. Because that's just not the approach that they were trained in. And I see that a lot of people who have hormonal issues like PCOS or these types of conditions, a lot of times just get put on a birth control pill, which is like the worst possible treatment unless they really need birth control. So I encourage anybody that wants to get things checked, I use various methods for checking hormones. Like you can actually do cycle mapping where we look at your hormones across the whole month. And I do that through a lab called Precision Analytics or DUTCH. But there's lots of different options out there. Saliva and urine. But you have to work with a provider that's really kind of looking at what your goals are of testing and what information you really want to get out of it.

Robb: That's awesome. I did kind of a three or four piece series on my blog several years ago looking more at kind of male fertility and the options, pluses and minuses of HRT. I made the case that it would be great to get as broad a sense of what your hormonal profile looks like in youth, so that as that changes there's actually kind of benchmark numbers. If you feel really good at a total testosterone of this and free testosterone of that, then at least we have a benchmark. Once things start sliding, then it's kind of guesswork. Like some people do great at one level and not so great at another. But I had some folks jump on there and they really took me to task. They were like, "Well why aren't you addressing female hormones?" And I had said because it's literally a thousand times more complex. I barely have my head wrapped around the male hormone story. You know like in physics there's a three body problem. If you have three bodies orbiting each other ... It's a completely random system. Like there's no way to predict what's

going on with it. And you're talking about, I don't know, eight, 10, 12, 15 different interfacing hormones that you're supposed to get on top of.

Robb: But I like that recommendation of like a month long mapping and then using some methodology like DUTCH testing to be able to get a very broad spectrum picture of both the main substrates we're looking at and also the intermediates that are happening in between.

Dr. Seeman: Yeah so, we use the third day of the menstrual cycle a lot when we're looking at ovarian health or infertility. And so if you're going to get these "snapshots", make sure you're getting them at the same time of the menstrual cycle. Now the one thing I will say is a common time that women come to my office to request to get their hormones checked is perimenopause. And in perimenopause it's one thing if you're cycling regularly, but in perimenopause when we see this major dysregulation of the cycle, if I were to draw a map of what that looked like, a cycle map, I mean it would literally be bouncing like up and down and up and down and up and down and up and down and up and down. So, that can be a hard time even just to get those snapshots. We can basically already tell you what it looks like. And so there's sometimes not any sense in necessarily paying the cost of testing.

Robb: The classic one thing or the other.

Dr. Seeman: Yeah. Because just based on their symptoms, a lot of times we can tell. And then when it comes to actual menopause, the clinical definition of menopause is absence of the period for 12 months. So there's not necessarily a reason to once again, pay to test the levels. If you haven't had a period in 12 months you're technically clinically menopausal. Yeah.

Robb: Right. Gotcha. Well the next question actually gets into peri and menopausal considerations. Can a ketogenic diet affect perimenopause or menopause? Given all of the anecdotal evidence about keto babies and hormonal improvements et cetera, is it possible that keto could affect when perimenopause or menopause would naturally occur? Can it delay it or prolong it? And a little bit beyond that, but that's kind of the main gist of the question.

Dr. Seeman: Okay. So basically when a woman is born you are born with a particular number of eggs in your ovary and then when you start ovulating you actually only ovulate about 1% of the eggs that you're born with. That's pretty crazy. So we're born with like one to two million. At puberty we have about 400,000. And then we ovulate about 1% of that. The reason that women start to go through perimenopause is because we start to lose the number of eggs in our ovary. These little follicles that make estrogen. And it's the ovarian hormones that talk to the brain and the pituitary gland and they talk back and forth to create this "menstrual cycle". When we start to go through perimenopause and we have these fluctuations, if somebody has underlying metabolic disease, sometimes nutritional interventions may kind of kickstart things in a more regular pattern. So I've definitely had women who've had some perimenopausal issues of what I would consider estrogen dominance. So these are people who might have PCOS and insulin resistance or diabetes. They might have just obesity. So extra body fat. They might have some sort of other inflammatory process. Maybe they're a heavy alcohol user or they have environmental things like really bad xenoestrogen exposure.

Dr. Seeman: If you fix those things, I have seen women even in their perimenopause years, all of a sudden start to have normal menstrual cycles and I've had women who thought they were pretty close to menopause, because they only had two periods in the last year, that fixed their insulin resistance and started cycling regularly again. Now, the question

of does it delay menopause, likely not. Because what's happening, like I said, is you're losing the number of eggs or oocytes in the ovary. And at some point, they will ... You can't just prolong it. You're not going to stay fertile forever. At some point you're going to lose those oocytes. But you might be fixing some of the problems in between and things might start happening a little more regularly. But you're not necessarily reversing or slowing or prolonging it. But, I had a patient who was 47 and they got pregnant after they went ketogenic so you can never rule it out until the ovaries are done.

Robb: We started warning people when we ran our gym. Because we had women in their mid to late 40s and they're like, "I went through life ... Yes, I did every possible intervention. Nothing ever happened." I'm like, "Hey, I'm just telling you, people get fit around here and then they get kind of randy and things happen." It was like a baby factory and we had a woman that was 48 years old that again had run the gauntlet of in vitro fertilization and everything and none of that worked and then she got pregnant. And so it was ... Yeah. It's kind of funny what a little bit of smart training and appropriate diet can do in that regard.

Robb: Do you feel like a ketogenic diet is generally safe during pregnancy? If not, why? And if so, why would that be a potentially advantaged state for someone?

Dr. Seeman: Yeah. So great question. Because when we look at the nutritional recommendations in pregnancy, the current recommendation is to never let a pregnant woman eat less than 175 grams of carbs, when you look at the institute of medicine. But when you look at the actual literature, when they look at carbs, they basically say that the lower limit of dietary carbs that's compatible with life is zero, as long as you eat adequate protein and fat. And you and I and other super educated people understand that that's because we have a process called gluconeogenesis and your body can basically make carbs from protein and fat. Now do I think that that means that pregnant women should eat zero carbs? No, I don't. I think that pregnancy is of course not a time when you want to start experimenting with things and that's why it's very hard in the literature to suggest anything to a pregnant woman because people are fearful that there could be some adverse outcome with her baby or with the pregnancy and that you would be liable for that. So as providers, we have to kind of go by what the data says and we can't stray from that. Otherwise, we get concerns that there's going to be litigation if something happens.

Dr. Seeman: So I really started looking through because I had all these low carb women coming to me and they're like, "Listen, I feel great. I got pregnant. Can't I just continue to eat this diet?" And so, when we look at where these recommendations came from, they basically ... I kind of call it bad math. They looked at what the obligatory use of glucose was for the adult. They took two standard deviations above that. Because statistically we always use two standard deviations. They looked at the obligatory use of glucose by the baby's brain and then the fact that the mom was pregnant and she needed a few extra calories. And that's basically where they came up with this 175 gram number. Now when you look at a standard American diet being like probably upwards of 250 to 450 carbs, to tell a pregnant woman to eat that percentage of carbs could be harmful. And we have this saying in medicine of do no harm.

Dr. Seeman: So I think that the carb recommendations in pregnancy, especially in today's world of bad metabolic disease of women coming into pregnancy, this really, really, really needs to be individualized to each patient and what their metabolic health was coming into pregnancy. Because pregnancy nutrition is a big deal and it has to do of course with getting adequate nutrients and calories to grow this small human life. But it also has to do with epigenetic influence. And this is a fast growing area of medicine. But basically,

the nutrition, the stress, the climate, the pathogens, social behaviors that a mom participates in during pregnancy can literally change her baby's genetic code and it can get passed down from generation to generation. So this isn't something to be taken lightly when we're talking about how a pregnant woman should feed herself.

Dr. Seeman: Now, of course you need a few extra calories in pregnancy. First trimester versus second and third trimester is a little different. And the first half of pregnancy is a little different than the second half of pregnancy. So in the first half of pregnancy we immediately see this increase in production of insulin. About a 30% increase from the pancreas and in the first half of pregnancy they're actually a little bit more insulin sensitive. And then in the second half of pregnancy we see a rise in leptin and a rise in insulin and we actually see quite a bit of leptin resistance and insulin resistance and this is so that the maternal appetite is maintained and so that nutrients are shunted across that placenta. Basically, in pregnancy the placenta is what I call like team fetus. And it's the body's way of giving an unlimited amount of energy to this growing baby at the expense of the mom. So in the second half of pregnancy it's very normal to see ketones in the bloodstream. Urine ketones do not correlate with serum ketones. So this is something that a lot of OBGYNs don't understand because we didn't really talk about it in our training.

Dr. Seeman: But there's all these adaptations that are happening inside the baby. And it's very normal for babies to be getting ketones across the placenta. They do cross the placenta. But, insulin does not. So as you have high levels of blood sugar in the mom's bloodstream, it's forcing the baby to make its own insulin. And this could have some really bad physiologic adaptations after the baby is born and you cut that umbilical cord. So carb intake is super important to moderate in the second half of pregnancy to keep the mom's blood sugars in a normal range. We don't want hyperglycemia and that's why we test for gestational diabetes at about 28 weeks in the pregnancy. Now, one thing I do want to touch on, because this is kind of uncharted waters for most obstetrical providers, is that women who eat lower carb in pregnancy, traditional glucose testing probably isn't the best idea. So their body is not used to seeing a 50 gram glucose challenge and their pancreas isn't primed for that either. So they're more likely to fail it. So it will look like they have diabetes basically from not eating as many carbs in pregnancy.

Dr. Seeman: But, when a baby is born, when you actually cut that umbilical cord, if that baby has hyperinsulinemia, so making high amounts of insulin, it can cause the baby to have electrolyte disturbances and low blood sugar. And it increases oxidative stress to that baby. And it can cause a lot of issues and it's a common reason for NICU admissions. We also know from some big trials that have come out in the last number of years, The HAPO trial, which is the hyperglycemia adverse outcome trial. And now they've followed those babies after multiple years. That even women who passed their glucose test that have high blood sugars, their babies are bigger, have higher NICU admission rates, higher complications at delivery, and longterm have higher rates of obesity and diabetes. So here is that epigenetic influence that's happening.

Dr. Seeman: What we saw from that data is it is basically a complete linear relationship. The higher the glucose is, the more problems that those babies have longterm. So it's hard to pick a number and just say okay, here's the cutoff. That's why this needs to be individualized and that's why if I had a bagillion dollars I would slap a continuous glucose monitor on every pregnant woman and just tell her to eat to normal glycemia. Because it's really hard to look people in the face and say okay, you get 50 carbs, you get 100 carbs, you get 150 carbs, right?

Robb: Right.

Dr. Seeman: Because I think there's kind of like these three buckets that we can put these pregnant women in. So that's the hard part. So for a lot my pregnant women Robb, I try to either get continuous glucose monitors or we really try to do testing before they get pregnant to see what their insulin resistance is like. But even for people who are insulin sensitive, they still need to moderate carb intake too. I have people with normal fasting insulin prior to pregnancy and then they still get gestational diabetes. So it really needs to be individualized. And it's all based on how that placenta grows. How much human placental lactogen and HCG that that placenta is putting out. So it's very individualized. So, this is a really cool area of medicine for me to be in and it's something we really have to talk about a lot. But work with your provider. Figure out how to do glucose testing. I don't think zero carb is the answer. Some carbs in pregnancy are important because of things like leptin and things like that too. So it really just has to be individualized. That was a long answer and probably didn't answer all of the things that people are thinking.

Robb: No, that's phenomenal.

Dr. Seeman: But the other thing too is that when we think traditionally like ancestrally, pregnant women need tons of fat and protein. Tons of fat and protein to grow this baby. Sex hormones are made from cholesterol. The baby's brain development is ... We need fat and we need ketones to help with brain myelination. So these things are super important. And breast fed babies actually use a lot of ketones and creatine and all these things that come from animal food. So fat and protein is super important and that should not be vilified in a pregnant woman's diet by any means. And when a pregnant woman is eating carbs, she's trading that micronutrient for protein or fat.

Robb: For some fats. Yep.

Dr. Seeman: Yeah. And so that's what pregnant women really need to understand too, is fat and protein is super important too.

Robb: That's awesome.

Dr. Seeman: Don't just focus on carbs.

Robb: That is the most thorough answer to that question I've ever received so that is awesome. And just really quickly, I guess just riffing on that just a little bit. The work that came out of the Weizmann Institute in Israel ... And this was kind of the backbone of my second book, *Wired to Eat*. It showed this just stunning spread in how different people responded to the same glycemic load. Like I would eat 50 grams of carbs from rice, my wife Nicki would eat 50 grams. Even though she's 30 or 40 pounds lighter than I am, her blood sugars were lower. Like dramatically lower than mine. And so there's just that enormous spread there and it is unfortunate that it's such a bugger and so expensive to get a CGM on people. Hopefully over time that gets to be easier.

Robb: But, Hannah has a great question. Birth control pills too IUDs. "I'm really wanting to get off birth control. It seems there are two kinds of IUDs. One with hormones, one with the copper without hormones. What are the benefits of no hormones at all? Is low dose hormones in a localized place still just not a good idea? My nurse practitioner didn't have a lot of answers."

Dr. Seeman: That is a great question. First of all, birth control has its place in the world. Birth control has allowed women to choose when they want to have a pregnancy and when they don't want to have a pregnancy. Which is great because in this day and age, just like me, I'm a working mom, I had three babies in 23 months but I'm done.

Robb: Holy smokes.

Dr. Seeman: I have met match to this reality. So birth control has its place. But, birth control can come with side effects. And anytime you're kind of turning off a system, you have to understand what the downstream ramifications are. So this is an excellent question. This particular person is asking about IUDs, or intrauterine devices, which I'm super biased towards because they are a form of what we call, long acting reversible contraception. Which means that they work really well for patients. The user satisfaction is super high when we look at the studies. And they come with less side effects than combined oral contraception, which are birth control pills. Those are probably my least favorite because it comes with the most amount of side effects. What women don't hear a lot from their providers is combined oral contraceptives deplete the body of B vitamins, zinc, selenium, magnesium. So if your diet is not great to begin with and you put a patient on a birth control pill, it can have tons of downstream effects. So, I like IUDs because they're a little bit more localized effects.

Dr. Seeman: So we have two types. We have a progesterone IUD and then we have a copper IUD. The progesterone IUDs are things like Liletta, Mirena, Skyla, Kyleena. And they have differing amounts of a progestin called levonogestrel. So it is a synthetic progesterone. And then the copper IUD, there's only one on the market called Paragard and they work a little bit differently. The progesterone IUDs tend to be more popular in my clinic because the advantage is that we see about an 80% reduction in periods at three months and a 90% reduction at six months. So most women love that. Periods are much lighter or they go away. The copper IUD women will still have their regular periods and in a small proportion of women, the periods might get heavier. My theory with this is that zinc and copper compete for each other in the body and so if you have somebody that doesn't have good zinc in the diet and then you put a copper IUD in them, it can exacerbate their zinc deficiency and I think that's what causes the heavy bleeding. So women just need to know that. Sometimes I will put patients on zinc supplements who have copper IUDs if that's an issue. And I've seen it resolve.

Dr. Seeman: The copper IUD is nice, that it doesn't have hormones. It's a great form of birth control but we have to keep in mind it's a foreign body and it is secreting copper inside the body. The copper ions are toxic to sperm and so that's how the mechanism of the Paragard works. The levonogestrel IUD, the progesterone thickens the cervical mucus so that sperm can't swim through it and it slightly decreases the tubal motility. You know, moving the egg down to the uterus. But some women do still cycle with a progesterone IUD. So it doesn't necessarily turn off a cycle. A lot of women will still cycle. That's why they're still noticing a menstrual period possibly. But levonogestrel can have side effects as well. So progestins can cause changes with hair, skin, nails, acne. I have had some women with insulin resistance that putting that levonogestrel IUD in just seems to really kind of halt weight loss and things like that. Although no studies have really shown a correlation with weight gain. I do think that there's some other kind of hormonal nuances at play there.

Dr. Seeman: But I tell patients you still have to do the work. I don't put the IUD in and it suddenly puts 20 pounds on you. You still have to put the doughnut to your mouth per se. Because a lot of women like to blame. They're like, "Yeah, I went on this birth control and I gained 20 pounds." We could debate that all day. Yeah. You still have to do the work to make it happen. Does that answer the question?

Robb: Yeah. Yeah. Yeah. That's phenomenal. That's phenomenal.

Dr. Seeman: But they're super popular and they're well covered typically with insurance and the copper IUD is 10 years and the progestin IUDs are anywhere from three to six years. So it's nice because it's kind of like a leave it and forget it kind of birth control.

Robb: Wow. Wow. That's incredible. Rebecca has a question around PCOS and hirsutism. "I am working on managing my PCOS with diet and lucky to have more minor symptoms of excess androgens. Like some hirsutism and it's harder to manage my weight than it was before the PCOS started to really manifest. I don't have any cycle or ovulation issues, which I am extremely grateful for. Obviously my biggest priority is restoring my insulin sensitivity. But as superficial as it is, the hirsutism and subsequent scars from removing hair have probably been the hardest part to deal with. Are there any tweaks that can be made to a keto or a paleo diet that can help in this situation?"

Dr. Seeman: Yeah. Great question. So PCOS, polycystic ovarian syndrome, is like this spectrum. I have patients who on this end of the spectrum are very obese, tons of metabolic disease. They might have a full beard. So hirsutism is basically from these male type androgenic hormones. They start to get hair growth and acne and hair patterns on the body more consistent with male type patterns. And then on the other end of the spectrum, we might have patients that are super thin. They have no hirsutism at all but they're completely oligomenorrheic or amenorrheic, meaning they're not ovulating because they have insulin resistance at the level of the ovary. So it's like this big spectrum. So this patient says, I'm having normal menstrual cycles but I have this hirsutism, these high androgen levels. And so fixing the insulin resistance will a lot of times help bring those androgen levels into normal physiologic ranges possibly. But sometimes the downstream effects of high androgens like hair growth and acne and things like that, sometimes can be harder to treat just with the diet. Especially the hair growth. So like for dark hair growth, a lot of times I do refer patients for laser hair removal because it tends to be the most permanent option rather than waxing or shaving or those types of things.

Dr. Seeman: And then also for the acne scarring, new technologies like PRP. So like plasma rich platelets. You can do facials now that they can put PRP right on the skin or right on the face or even inject if it you have a large acne scar. And a lot of times it will help from an aesthetic. I think that was kind of the question here is, I feel very vain, but aesthetically I don't like seeing this. And that's a common thing with women. We want to feel good on the outside. So I would work with a dermatologist and maybe do some PRP treatments or laser hair removal. There's other hormonal treatments like spironolactone and things like that too, but they're more of a short term and not necessarily a permanent option and do come with other side effects.

Robb: Awesome. Awesome. Amazing. Sarah has a question on C-section and infant gut microbiome. "We're looking to get pregnant. I had 250 grams of fibroids removed from my uterus in 2017. As a result my uterus is strong enough to carry, but not strong enough to give a natural birth. I will have to get a C-section. Not ideal I know, but it's the reality. What is the best thing you could do beyond a swabbing event right after birth to give your child the best change of having a good microbiome?"

Dr. Seeman: That's a great question. We have really, once the human genome project happened, found out there is definitely differences in the microbiome of babies born vaginally to those born via C-section, so through the tummy. Now, we can't avoid C-sections. This patient's had something called a myomectomy where they've had tons of fibroids removed and because of the scarring in the uterus it's not recommended to labor because of the risk of uterine rupture. So in this situation the patient has to have a C-section so the question is what could you do to optimize your baby's microbiome after

birth. This person brought up kind of this idea of vaginal seeding. So when she said wipe the baby down. There's kind of this new thing where you can put four by four gauze sponges in the patient's vagina and then after the baby's born via C-section you kind of wipe the baby down with these sponges, just kind of mimicking that the baby would have come through the vagina. And you kind of wipe inside the nose and the mouth and these places.

Dr. Seeman: Now, doing this does make an assumption that the mom's microbiome is perfect.

Robb: Is healthy.

Dr. Seeman: Right. And it's healthy. And it doesn't have any pathogenic bacteria like E. coli or group B strep. There have been case reports of babies who have had vaginal seeding and then died of group B strep sepsis or E. coli sepsis. So you have to keep that in mind. So the current recommendations are that vaginal seeding should really only be done in places where they're doing studies on this or at a hospital system that has a really good protocol for this. There are a couple companies that are looking at creating a microbiome solution for C-section babies that it is the perfect microbiome. So the baby comes down and you wash it down in this bath. So there's lots of things kind of coming into this space, but I don't have any great advice because of none of it's really been well studied. The best thing you can do though is breastfeed your baby. There are some people too that will give babies probiotic supplements to help kind of supplement their gut right after birth. So talk to your pediatrician or your healthcare provider about that. But that's about the best thing that we have right now is to breastfeed and probiotic supplementation after birth.

Robb: Awesome. This is kind of, I guess, a person question that I receive frequently. Or almost kind of an observation I guess, where folks do all this diligent work during their pregnancy. They have a home birth and the birds sing and Bambi walks up to the window and blesses the kid and all the stuff is great. And then a month into things the kid gets an ear infection or something and gets put on a round of antibiotics. And people kind of just are crushed. Like, "Oh, I failed. My kid's going to be broken forever." And I've done, I think, a reasonably good job of talking folks off the ledge with that. Do you have any thoughts around that?

Dr. Seeman: Yeah. We do know that antibiotic use early in life can have longterm effects. And that's why we just need to be really prudent that they're needed and that they're necessary and that you're not giving them for viral infections, and that you've really given the body time to fight it on its own before you intervene with antibiotics. But antibiotics have their place. I mean, look, statistically there's a lot of us that would have died in childhood from XYZ had we not had modern day medicine. But I mean if you are breastfeeding and if you're eating a good diet and you're doing all these other things, I mean you're mitigating the risks of these types of interventions. But sometimes they are necessary so yeah, don't be yourself up over it. Sometimes we do all the things perfectly and things happen. But all we can do is what I say, control the controllables. So control the controllables and don't stress about the things that you can't control. You're really doing the best that you can for your baby.

Robb: Awesome. Great advice. And the last one we have is from Laurel. "I'm 52 and still have a normal cycle. When should I expect the change to occur?" So now you get to put on your Madam Ruby future prediction glasses and see where you go with that.

Dr. Seeman: Yeah. Well, statistically it would happen in the next couple of years. The average age of menopause in the United States is between 50 and 51. And it's once again, absence of

the menstrual cycle for 12 months. But there are factors that play into this. Genetics and race. When your mom went through menopause. And then what your underlying health conditions are. So obesity and things like that can play a role as well. But statistically it will happen soon because you're beating the odds. You're falling into the other 50% once you pass 50, 51. But I have a patient right now in my clinic that's 57 and still cycling so there's always people that fall in the two standard deviations and outside. So who knows, you might be in the special 5%.

Robb: Which may be great or she may be like hey, I'm ready for this thing to wrap up.

Dr. Seeman: Well, I'll give her a little small round of applause because there are some major metabolic changes that happen when you go through menopause and the later you go through menopause you're still getting the good estrogen effects and things like that from your ovaries. So there's pluses and minuses to it all.

Robb: So before we go then, I'll dig into that just a little bit. The topic of hormone replacement therapy is just an incendiary landmine. Like talking politics is possibly one of the only things that could get spicier more quickly. There are some studies that suggest that hormone replacement therapy increases various rates of cancers and doesn't beneficially influence various health outcomes. Where are you in this story and when should a woman consider the various types of hormone replacement therapy and do kind of that risk benefit analysis?

Dr. Seeman: Yeah. When I came through training, we kind of had it beat into us that hormone replacement therapy really should only be used for the shortest amount of time, right around menopause, and only for things like vasomotor symptoms, which are like hot flashes and night sweats. And that's because there were some large trials like the women's health initiative and the nurses study and couple other studies that came out a number of years ago. We used to just give all women hormones. And these studies came out showing a slightly increased risk of blood clot and stroke in women in their 60s and an increased risk of breast cancer in the women who were taking both estrogen and progesterone. Now, in these studies these were oral synthetic hormones that were given and they were given to ... When you look at the population that were studied, they were in their 60s, they were well past menopause. A lot of them were obese. Some of them were smokers. So the people in these studies were not the ideal candidates for hormone replacement therapy. And since then, even in the WHI trial, the authors have since kind of redacted some of the things that they said and there's been new studies that have been published.

Dr. Seeman: What we do know is that hormone replacement therapy for selected women can actually have a major amount of benefit for these women. We have estrogen receptors in our brain and in our hearts and in our bones. And it's not just the hot flashes and night sweats. We've actually shown that we can see decreased rates of cognitive decline, like dementia and Alzheimer's in patients that do receive estrogen therapy. So it needs to be very individualized. And there are safer ways to replace hormones. We can replace them transdermal through the skin or under the tongue. Or even with subdermal implants. And these types of replacement methods bypass the liver so we don't see the increase in blood clot and stroke that we see with oral estrogens. If you have a uterus and you're taking estrogen, you have to take progesterone with it to help protect the uterus from unopposed estrogen. So in women who don't have a uterus, you could take estrogen therapy alone. But I do use hormone replacement therapy in my practice. I don't give it orally. I do transdermal, sublingual, or subdermal implants.

Dr. Seeman: And there's lots of backlash about bioidentical hormones because the problem with bioidenticals first of all is that they weren't part of the large studies. So people will argue it's the same receptor, it's doing the same thing. But really, is it? I mean, synthetic progestins and things like that, they don't fit necessarily into the lock and key the same way. But the problem is if you're going to make a transdermal cream for instance, when you swirl the hormones together in this little jar, when you scoop some out, how do you know if you're getting the right amount of estradiol or micronized progesterone or testosterone? So that's the hardest part with dosing is it may not be as precise.

Robb: The consistency?

Dr. Seeman: Yeah. So that's why there's different dosing methods. And then of course ... You had talked about male hormone replacement therapy. We're seeing all these testosterone clinics popping up and people that maybe shouldn't be managing hormones. And as an OBGYN I've seen some of these train wrecks come in where people are being treated with these super physiologic levels and there's lots of side effects with that too. So you need to work with somebody that knows what they're doing and knows what they're giving you and is making sure that you are an ideal candidate. Because there are a small proportion of the population that it's a little bit riskier.

Robb: Gotcha. Gotcha. Great answer. Doc, thank you so much for carving out time to come onto Healthy Rebellion. Can you let folks know where to track you down on the inter webs? Although the fact that you were basically the person to talk to, I think everybody knows where you are. But in case there's like two people in there that don't, where can they find you?

Dr. Seeman: Yeah, you can find me on social media. Facebook and Instagram. Doctor Fit and Fabulous. And I've got a website, doctorfitandfabulous.com. I'll be speaking ... Well, knock on wood I guess with Covid-19. I'll be speaking at a few different places in the next year and I love meeting people so don't be a stranger. Feel free to reach out.

Robb: What's your theoretical schedule as assuming things actually happened?

Dr. Seeman: Well, I halted a couple projects. I was going to be speaking at KetoCon in June, but I think that's still kind of up in the air. I think with Covid-19 we're going to see kind of a two month wave of illness that it's probably not going to just suddenly disappear in two months so I think there's going to be some downstream scheduling effects probably through the end of the year.

Robb: Right. Well, in theory I'm supposed to be at KetoCon, so if we both make it there I will buy you some barbecue.

Dr. Seeman: Love it.

Robb: It's an easy drive for me so we'll get you hooked up on that. But hey, thank you so much and look forward to seeing you in real life.

Dr. Seeman: Appreciate it. Thanks Robb.

Robb: Awesome doc. Take care. Bye.

Nicki: That was a great interview Robb.

Robb: You know, it's funny. I did a couple of pieces on kind of Men's health. Like TRT, stuff like that. And I had some very cranky people comment. This was a while ago. Back when people actually commented on blogs.

Nicki: This was quite a while ago. Yeah.

Robb: But they were like, "Why didn't you cover women's health?" And my reply to them was, "It's at least 10 times more complex and I don't consider myself an expert on it. So I felt like it would be providing a disservice for me to comment on something that I don't actually understand." And as cranky and prickly as those people were, that actually seemed to resonate and Dr. Seeman is one of these folks that really has a fantastic understanding of so many of these interrelated, but incredibly complex women's health topics. So I just really appreciated being able to both go deep on these things and also go from the 30,000 foot level down to the really detailed level and cover everything in between. It was good.

Nicki: Awesome. Anything else?

Robb: I don't think so.

Nicki: No? Okay. Well, thanks for joining us. Please check out our show sponsor, Athletic Greens. You can go to athleticgreens.com/wolf and you can get 20 free travel packs with your first purchase. And I think that's a wrap. If you want to get on this upcoming 30 day rebel reset with the seven day carb test, you can go to join.thehealthyrebellion.com and we'd love to have you and we're kicking that off today.

Robb: Take care.