



# Healthy Moms Podcast

BY **Wellness Mama**<sup>®</sup>  
simple answers for healthier families

Episode 135: Understanding Genetic Testing,  
Epigenetics and Genetic Polymorphisms with Dr.  
Ben Lynch

Child: Welcome to my Mommy's podcast.

This podcast is brought to you by Vivos. This is something we recently invested in for our entire family and we are absolutely loving it and here is why. So, data shows that the nutrition we receive in utero determines our palate development and how narrow or open our airway and jaw structure are. So a narrow mouth, jaw and airway increase the chances of needing braces, of getting sleep apnea, breathing difficulties and much more. But it was pretty much assumed that your jaw structure was set in stone once you were born or for sure after the first couple of years of life. But Vivos has found that not only is this not true, but they created a non-invasive, non-surgical, easy way of widening the maxilla, the jaw and the airway. So for our kids, this means that they get to avoid the braces that my husband and I both had and for my husband, this means his sleep apnea has disappeared and he stopped snoring, which is a bonus for me. I'll be writing more about this soon but you can check them out, in the meantime, at [wellnessmama.com/go/vivos](http://wellnessmama.com/go/vivos)

This podcast is brought to you by Beekeepers Naturals. Humans have been benefitting from bees and their nourishing super foods since prehistoric times. From Cleopatra using honey to keep her youthful glow to Hippocrates prescribing propolis to cure everything from sores to bacterial infection. Our healing relationship with bees goes way back. Beekeepers Naturals is dedicated to bringing the age-old benefits of bee products in to modern times. And they offer really high quality propolis, royal jelly, bee pollen and raw honey and many other products. And all of these are sustainably sourced from a company that is dedicated to protecting and improving the bee population. My personal favorites are their propolis spray, which helped me to head off a scratchy throat, and their B.LXR mix which is a mixture of all of those ingredients and it's a natural nootropic that I use on busy days. You can check them out at [wellnessmama.com/go/beekeepers](http://wellnessmama.com/go/beekeepers)

Katie: Hello. And welcome to "The Healthy Mom's Podcast". I am Katie from [wellnessmama.com](http://wellnessmama.com), and this is gonna be such an awesome interview because I have today Dr. Benjamin Lynch, who is most importantly a dad of three amazing boys, but he's also a doctor. And he's considered one of the top experts in the world on epigenetics and genetic polymorphisms. He is super well qualified. He has degrees in biology and he has a naturopathic degree from Baiser University, but really he has done the research and really delved into nutrigenomics and methylation and genetic research. And he's definitely hands above a lot of the other researchers.

So he writes about all these topics and he has a new book called "Dirty Genes", which is awesome. I got a chance to read it and you really should check it out, if you're interested in this topic because it is incredible. His work is found at his own website, [drbenlynch.com](http://drbenlynch.com). And he also is the president and founder of Seeking Health, which you've probably seen me recommend a lot of their supplements on Wellness Mama. So I'm excited to have him today. Dr. Ben, welcome. Thanks for being here.

Ben: Pleasure as always, Katie. Thank you.

Katie: Oh, I'm excited. I want to jump right in because I think this is a topic that people really do have a lot of questions about, especially now that we're starting to really understand it on a deeper level. So I want to start kind of broad and then get narrow with some specific questions from listeners. So to start off, can you kind of explain what we're able to test and know about genes with modern technology we have and also what the

limitations are when it comes to testing?

Ben: Wow. That's a great question. We can test a lot. We can test your entire genome, I mean, your entire DNA, nuclear genome, your entire mitochondrial genome. We can test your microbiome genome pretty much entirely, you know? But the question is all right, you do all that, you get all the data sets back. Which are actually huge files. They're gigabytes in data. And how do you weave through that? How do you make it applicable to real life as a busy mom, a busy dad, or, you know, as a kid who's interested in learning about it yourself?

So the data is there. The tools are there. The amount of errors that you get in genetic testing are pretty small when you use a company like 23andMe, but if you're using kind of mom and pop shops that are kinda popping up all over and saying, "Hey, order my DNA chip and you can find out about if you're a fast metabolizer of caffeine and if, you know, you're gonna get obese at 40 or you're prone to diabetes," kinda these mom and pop genetic tools that you can get and that you order their genetic DNA test kit itself, as well, I would question their effectiveness. I question their accuracy.

You know, the big players like Viome, 23andMe, Gnosé, I think these guys are...well, I know these guys are pretty credible, pretty legit. But, you know, I would keep it at that. And, you know, we're coming out with our own DNA chip. And it's the same manufacturer as what produces 23andMe's chip. So they're a very credible company. It's taking us some time to create it because we're making sure it's accurate. And when I called the company, I said, "Hey, you know, we really want to make our own chip because 23andMe does not have some of the genes that we really want." And they said, "Well, that's cool. You can add 1,000 genes that you want to put on there on your own." I said, "Okay. Well, that's cool. We've got about, you know, 500, 600, that we're interested in." And they said, "Okay. Great."

I said, "Well, what's the accuracy of it? You know, if someone tests their MTHFR and they want to know if they have 1298 or 677," we'll get into that a bit later, if we need to, "If they test for a certain gene, what's the specific accuracy of your test?" And they said, "Oh, it's about 80%." I said, "Well, 80% isn't good enough." So out of 1,000 genes that they said I could put on there, really we can only have about 330 because we have to repeat the test three times to make sure it's accurate. So, you know, we reduced that 1,000 down to 333 because we want people to get the right information.

Katie: That's exciting. I didn't know you were coming out with a test, as well. And I think an important thing that you talk about and I know you've written about this, but I want to make sure we explain it here too is I've seen this kind of play out where people will test their genes, and then kinda get like really concerned that this is absolutely like, "Oh, I have the gene for this. I'm gonna get cancer, I'm gonna get this." And so I think this is where your research is so important. And so from understanding the basics of genes and the testing, can you now also explain epigenetics and what that is and how that relates to our genes?

Ben: Yeah, for sure. And you're absolutely right. You know, when I first got my genetic test back years ago and I found out I had MTHFR, a significant one, and then I found out my kids had it, I was terrified. I was really scared. And then I realized...I did more research on it. And I realized that, you know, the Italians have a very, very high rate of MTHFR that slows it down in its performance a lot, as well. And I said, "Okay. Well, how frequently do the Italians have neural tube defects or miscarriages or anything that has to do with MTHFR?" Well, I shouldn't say that, have neural tube defects.

And while the Americans and the Chinese have a pretty high rate of neural tube defects if the MTHFR polymorphism is present, the Italians don't. And the Italians have the same severe, you know, MTHFR gene as the Americans and Chinese. So why aren't they having babies with neural tube defects? Well, if we think in our head where would we want to go on vacation, you know, we're gonna pick Italy probably because they are light-hearted people. They are in good sun, sunny weather. They have a very good Mediterranean diet. You know, I'm stereotyping here. You know, they have a significant amount of vacation. And family's really, really, really important to them. So their lifestyle, their diet, their mindset, their environment, are playing key roles in how our genes are functioning.

And just because you have an MTHFR genetic variant, which many of us have, doesn't mean it's a problem. And I'm living proof of that now. Before my MTHFR was acting up, but it was because I was not eating my salad. It was because I was exercising way too hard at a collegiate level in rowing and I was burdening my body. I couldn't handle it. I wasn't sleeping very well. I was eating college food even after college. I didn't eat salads. I was taking folic acid. So all of these contributed to my MTHFR getting what I call dirty now. And so I've cleaned it up by living a more healthy lifestyle, reduced my stress load by doing what I love, eating healthy, and getting rid of the people that caused stress in my life by just not associating with them anymore and finding people that I resonate with and spending more time with my family and taking vacations. And my dirty MTHFR is now clean.

Katie: Yeah. And you explain that so well in the book, but...so basically to make sure everyone listening understands, and even that I understand, basically our genes are kind of our code that we're born with, but those can be essentially like, to oversimplify, turned kind of on or off or made more or less severe by our environment. And that would be things like the sunlight and the stress and the sleep. Is that right?

Ben: Yeah, exactly. Think of it like we all have lights in our house. You know, we have canned lighting or lamps in our home. And they're there but they're not functioning unless we flip the switch on, right? So we have to flip the switch on. We have to turn our genes on. And we can also turn them off as well. And we don't want our genes on all the time. They kind of pulse. And so it's the lights. Sometimes you want them on in your home, sometimes you want them off. And we control our genetic expression by our perception in the environment, by our food that we eat, the food that we don't eat, the vitamins and minerals that we take, and how we perceive if it's dangerous around us or not. Bruce Lipton does a wonderful job of explaining this, as well.

So we have to understand that our genes are very, very buried inside of our bodies, inside of the nucleus, all wrapped up and coiled. And the nucleus is inside the cell. And so our DNA sits there all wound up, and the nucleus is in the middle. And then surrounding that cell is the cell membrane. And on that cell membrane is a bunch of little antenna. And those antenna will receive hormones, neuro-transmitters, you know, chemicals, vitamins and minerals, sunlight. And they will perceive it and then they'll bind to the receptor on the cell membrane. The cell membrane will send a signal down to the nucleus and say, "Hey, DNA, wake up. Make this gene. Turn it on. We've got some work to do." And then the signal will go away and the gene will go back to sleep again. So kind of think of it like that.

Katie: Yeah, that's a great analogy. And so kind of, I think to go deeper with this, another term that you use a lot, especially in "Dirty Genes", which explain this all in depth, but you use the term genetic polymorphisms. So can you explain like specifically what that means and maybe what a few examples of that would be?

Ben: Yeah. So genetic polymorphism is a very, very common, what a lot of people think is a mutation. It's a differentiation of what our typical ancestors have. So we'll say the majority of the population spells the name Matthew with two Ts, M-A-T-T-H-E-W. And that's Matthew. I spell my son's name Mathew with one T because it's more Russian, M-A-T-H-E-W. So the common variants or the common majority of people spell it Matthew. I have a Mathew as a polymorphism in his name because he is missing a T, right? So the function is still the same. His name is still, you know, recognized. It still sounds the same, it's still acting the same. But there is a slight variation in it.

So the same with genetic polymorphism. It's like MTHFR. There's a slight misspelling in the gene. And since there's a slight misspelling in the gene, it changes that gene's shape a little bit. And when you get an altered shape, you get altered performance. So having a variant or a polymorphism in MTHFR can slow it down by anywhere from 20% all the way up to a very, very severe form like 90%. And it's very common. And since genetic polymorphisms are really common, we have to ask, "Well, if they're really common, then there must be some benefit to it." And there are. So like MTHFR has been around, it's been naturally selected for, over multiple generations because people who got exposed to malaria, our ancestors, if you had MTHFR, you survived it. You know, that increased your survivability, if you had MTHFR.

And there's various reasons for that. But nowadays, we don't really live in environments with malaria, most of us, and we have MTHFR. So now we think of it as a burden and a problem but we've displaced our ancestral environment to wherever we are now. So I'm in Seattle. My ancestors most likely weren't in Seattle. They were in London or they were somewhere in Ireland. So I have transplanted myself. So snips are just a slightly altered function of the gene, but there is typically a benefit to it. And we commonly forget that.

Katie: It's such an important point. And I think that, I love that you make that distinction of genetic polymorphisms versus mutations because I think mutation has a very negative connotation. And it like, it does make the assumption that something is automatically wrong, but I think that that's a really important point. So you touched on MTHFR briefly, but from what I've read, there seems to be a whole lot of confusion about what this actually is on a genetic level and what it actually means for the body. So can you just walk us through like if someone has just maybe a moderate MTHFR polymorphism, like what that would look like as far as their body's ability to methylate in that instance?

Ben: Yeah. So if someone has a moderate, you know, speed of MTHFR, meaning we have to first understand that genes do work, okay? So genes are everywhere in us. And when they're called upon, they have to go to work. And so if you hire an employee or yourself... let's keep it real, let's keep it to yourself. If you stay up all night and you drink and you party and the next morning, you've got to get up at 6:00 and go to work, are you going to be performing very well? No because you've put all this burden on yourself and you can't now perform to your fullest potential. Now let's say it's dark outside and it's even harder for you to wake up. You need light to wake up.

So MTHFR kinda does the same thing where if you are born with an MTHFR polymorphism, your ability to handle stressors or alcohol is reduced. If you look at yourself and you compare yourself to your neighbor and say, "You know what? My neighbor can drink 10 beers. And they're fine. I can only drink one. My whole life, I've only been able to drink one," it's because your genes have their own set of ability to perform. And with MTHFR, it's slightly slower. It doesn't mean that it's bad. It still means that you have capacity to do work. MTHFR is only slightly slowed, we'll say by 50% capacity.

That means that you shouldn't drink as much, it means you should sleep better. It should mean that you should eat more salad or, you know, exercise more moderately. So your methylation cycle, a lot of people are not gonna know what that is, but it controls a lot of important things like making your cell membranes via making your neurotransmitters. And MTHFR regulates that. So if it's not working as well, then your methylation cycle of making your neurotransmitters and your cell membranes is also not gonna work as well, but a lot of people freak out about that. But again, having a 50% capacity of your MTHFR to support your methylation is usually enough. It's usually fine, I mean, because it's been selected for over multiple generations.

The problem is our ancestors didn't have internet. Our ancestors didn't work past evening because it was dark outside. You know, they didn't walk around with fire all night and type on their iPads and do emails. So we have evolved to put more work and demands on our genes than our ancestors had. And that slower MTHFR was good for them, but for us, it's not because we keep putting the work on. I hope that makes sense.

Katie: It does. So basically, to make sure I'm understanding, someone who has any kind of polymorphism with MTHFR, they would have trouble converting I believe it's folate or folic acid into the more usable form for the body that would be important in all of those reactions. And things like lack of sleep or drinking too much, those would all further impair the body's ability. Is that right?

Ben: Yeah, yeah. So folic acid is, you know, is way...there's many, many steps to convert folic acid into the body's usable form of folate. And the body's usable form of folate, the primary one, is methylfolate. Over 80% of your folate in your blood is methylfolate. And that's made by the MTHFR gene. So it's very, very important, but you can also get folate from your food, your leafy green vegetables and organ meats, especially liver.

Katie: Yeah, that's a great point. Another...so we did, you were one of my very early podcast interviews. And I got a lot of great questions on that one. A lot of people also asked about VDR polymorphisms and what that means for the body and like how the environment impacts that. So can you give us a little primer on that, as well?

Ben: VDR is a gene that's got a ton of research and there's a lot of polymorphisms there. The problem is VDR stands for Vitamin D Receptor. And as we know, Vitamin D is extremely important. I mean, it's all over the news and you're probably taking it yourself. And a lot of your listeners, as well, they should be. But VDR's job is to...there's a lot of them. So the research is conflicting. So I can't give you a straight answer on what common polymorphisms VDR has, like VDR Fook or VDR Tac. They're common snips for VDR.

One research paper will say it can increase your risk for cancer and another one will say it will decrease it. Another one will say it will increase your risk of diabetes, another one will say it will decrease it. So you can't make a judgment call on what the impact really is right now on VDR because the research is still too new and conflicting. And part of the reason is, is because research is looking at trying to pinpoint a singular variable. And any time you try to pinpoint a singular variable on such an important gene like VDR, it's hard. MTHFR, it supports the production of methylfolate, which supports methylation. And you can check homocysteine to kinda see how that's working. That's pretty easy.

Now, when it comes to VDR, Vitamin D helps trigger insulin. It supports your immune system. It supports your bone health. It supports your bile flow and your liver health. I mean, it supports neurotransmitters and serotonin. It does a tremendous amount of things. So it's very difficult to pinpoint what these snips do for

VDR. So I cannot answer that, unfortunately, and neither can research.

Katie: That makes sense. Would you say that in general, for the most part, like with what we do know of research, that things like getting a moderate amount of healthy sun exposure would be one thing that would we think support someone with a VDR polymorphism?

Ben: Yeah. And so, you know, in my genetic tool report that I have strategizing, we do show VDR because people are interested in it. And I'm interested in it too. I'm trying to pinpoint where people are having problems. You know, a lot of people with autoimmune diseases have VDR. Is that...are they more prone, you know, to autoimmune if they have VDR? I'm not sure yet. So we're just kind of collecting data and asking people. So I would say you're right. Let's get out in the sun more. Let's eat, you know, fatty, fishy foods that provide Vitamin D. And let's supplement with Vitamin D and make sure we're getting Vitamin K, as well, so we don't just get high amounts of calcium in our system.

But we...and test for Vitamin D, you know, to see how you're doing. You know, 25 hydroxy Vitamin D, 25OH Vitamin D, you can get from your doctor is pretty inexpensive. The problem is if you are low in Vitamin D, let's say it's 20, and you supplement with it to get it up to 40 and you actually don't feel good, you actually feel worse. You're thinking, "Well, what's going on here?" And people need to order a ratio of Vitamin D. And a lot of doctors will look at you cross-eyed, just like they look at you cross-eyed when you try to order Free T3, Free T4, and all these other thyroid hormones. But the right way to evaluate Vitamin D is to order the 25 hydroxy Vitamin D and what they call the most active form, which is 125 Vitamin D. And very few are doing this.

And to keep it very short and very simple, your body uses a ton of Vitamin D for many, many things. And a big one is infections and mold exposures, lyme, you know, viruses and so on. So you can have low Vitamin D, but the problem is your active form of Vitamin D can also be very high. And if your active form 125 is very high, that's a sign that you're fighting an infection of some sort. And the virus has basically told the Vitamin D receptor, instructed it to not work because the bacteria and the viruses will bind to the Vitamin D receptor and make it ineffective. So if 125 levels are high because your 25 hydroxy is going in there... and this is all in-depth. It's probably getting too much for you guys, but basically, infections are smart because they want to control your immune system so they don't die.

They don't want to die. They want to sit there and reproduce just like we do. So they will suck all the Vitamin D, but make it inactive and not be able to make it work. So in short, if you want to really understand, I have an article on this on [drbenlynch.com](http://drbenlynch.com) about Vitamin D and infections. It has been read widely and I talk about the ratio of 125 and 25 a bit more in-depth there.

Katie: Perfect. I'll make sure that's linked to the show notes at [wellnessmama.fm](http://wellnessmama.fm) for anyone who's looking for it, if you're driving.

This podcast is brought to you by Vivos. This is something we recently invested in for our entire family and we are absolutely loving it and here is why. So, data shows that the nutrition we receive in utero determines our palate development and how narrow or open our airway and jaw structure are. So a narrow mouth, jaw and airway increase the chances of needing braces, of getting sleep apnea, breathing difficulties and much more. But it was pretty much assumed that your jaw structure was set in stone once you were born or for sure after the first couple of years of life. But Vivos has found that not only is this not true, but they created a non-invasive, non-surgical, easy way of widening the maxilla, the jaw and the airway. So for our kids, this means

that they get to avoid the braces that my husband and I both had and for my husband, this means his sleep apnea has disappeared and he stopped snoring, which is a bonus for me. I'll be writing more about this soon but you can check them out, in the meantime, at [wellnessmama.com/go/vivos](http://wellnessmama.com/go/vivos)

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Katie: Another one that we got a lot of questions about was this CBS polymorphism. So can you explain what that is and how that may affect our bodies?

Ben: There's a lot of emphasis on snips. There's a lot of emphasis on getting a genetic report back and saying, "I have VDR. I have MTHFR. I have CBS." And then what they do is they try to supplement or they try to fix the snip. And if you were trying to fix the snip of MTHFR by taking methylfolate, you're gonna maybe get lucky and have a good outcome. You might see you have a VDR snip and say, "Okay. I'm gonna take 5,000 IUs of Vitamin D every day. And that's what I should do." You see a CBS snip and you're like, "Oh, it's faster, and I'm gonna avoid Vitamin B6. I'm gonna reduce my sulfur intake. And that's what you should do."

So these gene snip polymorphism-based treatments fail over and over and over and over and over again. They do not work. All they do is they create frustration. And people are trying to treat the gene rather than themselves. So I actually try to encourage people to now stop using genetic testing because it's not being used right. So even though I'm developing a genetic chip, there's a reason I'm doing it because I want to optimize unborn children and I want to optimize people's lives. That's how you use genetic testing. You don't use genetic testing to treat a snip, to optimize your MTHFR, or to optimize your CBS. You optimize yourself.

And that's the big issue because the CBS is all over the internet. I've got videos on YouTube about CBS as well, that are free to watch. And CBS is...the most common variant polymorphism of CBS actually slows it way down and can increase your homocysteine. So the CBS gene, it's the number one cause for high homocysteine. That is genetic. So if your mom and your dad and your brother and your sister or a few members of your family have high homocysteine just across the board, the likelihood of you having a CBS gene which isn't working very quickly or effectively, it's dirty, then your homocysteine is climbing. On the internet, a lot of people are reading that, "Oh, I have a faster CBS gene. And therefore, I don't tolerate sulfur, and I can't eat much protein. And glutathione makes me sick. And Vitamin B6 is bad."

And so they cut the Vitamin B6 and they cut the sulfur. And they feel better for a little while, maybe a week or two, and then they start feeling really ill. And this happens all the time. So this is because they're treating the snip. And I teach professionals and the general public all the time that you need to understand how your body is working and why it's responding and what it means. And I talk about why sulfur can be problematic. And it

typically has to do with sulfites and molybdenum and inflammation. It has nothing to do with the CBS polymorphism. So I think the CBS polymorphism is bogus.

Katie: That's such an important distinction. And I think that's a great rule to apply to any aspect of life or medicine is to not treat like a single thing, but to treat the body as a whole, treat the person as a whole, and I love that. And you explain it really well in "Dirty Genes", but I love what you just said about you want to be able to use genetic testing to optimize unborn children and to optimize our lives in general. So can you talk about that? Like on a practical level, like how are you able to use genetic testing the right way to then help people to not have dirty genes, to clean things up in there?

Ben: Perfect. Great question. And I'll preface it with this, which is the whole concept of the book. The whole concept of the book is what we're doing on our daily lives every single day and every single evening, what we're doing or not doing is affecting how our genes are working. So you're either doing something right now that is helping your genes or you're doing something right now that is dirtying your genes or you're doing a combination of both. If you're sitting down, maybe not so helpful. If you're standing up and walking around or you're exercising while listening to this, that could be helpful. You know, if you're exposed to Wi-Fi, that can be dirtying your genes.

So what's happening nowadays with how inexpensive it is to get genetic testing, a lot of people are doing it because they're curious. And that's great. The curiosity is fantastic. Get the genetic testing, but you cannot run the genetic tests and see the report and say, "I have CBS. I have MTHFR. I have VDR. How do I fix that?" And you go to your doctor and say, "Doctor, fix that," because it doesn't work. You need to evaluate your diet, your lifestyle, your mindset, how much exercise you are doing, all the fundamental things. Once you do all of that, all of it, all the stuff that your grandmother told you to do, you're breathing right, you're exercising, you're avoiding the chemicals, all the stuff that they're learning on your website about enhancing their health, then and only then do you take that genetic report and you look at it and you say, "Okay. I have an MTHFR that's not working very well."

And then you ask yourself, "Okay. Am I taking folic acid? No, I'm not. I know that's bad. Am I eating leafy green salads? Yes. Yeah, I am. Is my homocysteine level high? No, it's about seven or eight. It looks pretty good. Great. Do I have any high blood pressure right now? No. That's good. Have I had any recurrent miscarriages, you know, just recently? No. Good. My MTHFR's clean. Okay. It's fine." Now, if a person comes in...you know, if I was seeing patients, which I'm not now...I wish I was, but I just don't have the time. If a patient comes in with a genetic report and they've done all the fundamental stuff, they've done all of the key core things--they're sleeping, they're eating right, they're breathing right, their community is good, their hobbies are good, and they're avoiding chemicals, they're doing all that good stuff--and they say, "Hey, we want to get pregnant," genetic testing can be very useful.

I'm not talking about genetic testing to see if the child is gonna be high risk for celiac or a high risk for, you know, these other genetic diseases and mutations that are really deadly and scary because what are you gonna do about it? You have no tools against that. You can't do anything. I'm talking about ordering genetic tests that show if you have MTHFR, that show that you might have a slower nitric oxide synthase, an OS3, which I talk about in "Dirty Genes", if you have a slower PEMT gene, which makes your phosphatidylcholine, your cell membranes, which you need for that growing baby, for making your placenta, for moving your bile so you don't get SIBO or fatty liver, very, very important genes. MTHFR, NOS3, and PEMT, all three discussed in "Dirty Genes" in-depth. And there's quiz questions in there, as well.

And that's what I used to do in the clinic. You know, when I was working with individuals, I would say, "Hey, you know, let's look at your labs. Let's ask you some questions. And we can determine if these genes are dirty or not." Just because you have an MTHFR that's low, because you have an NOS that's slow, or you have a PEMT and that's slow, it doesn't mean they are. It just means you're more susceptible to them. And so knowing this ahead of pregnancy is very powerful because if they are dirty, if you do have issues with fatty liver or you do have issues with your bile and you have gallbladder problems, or you're not eating leafy greens and your doctor told you to take folic acid, all these are gonna dirty your genes, which is gonna dirty the baby in developing. And it's gonna be born with a less chance to thrive and survive.

And so when you utilize genetic testing from an optimizing perspective to identify risks and support them, then you are doing a phenomenal job. And that's where "Dirty Genes" comes into play. And that's the real magic because there's quizzes built into it that tell you if a gene is dirty and then how to clean it up. And beyond that, it tells you what the genes do and how they work, so you understand when you get a symptom, it's like, "Oh, you know, now I have fatty liver. And PEMT is associated with, you know, moving this through and doing this and doing that." And once you understand the basics of that, then you say, okay. When it's dirty, you understand why it's dirty because it's not functioning right. And I give you tools on how to restore the function. Very easy and nonscience speak.

So for optimizing performance in sport, in school, if you have ADHD like my oldest son does, I use that to support him. He came home one day from school and said, "Dad, I'm really struggling in school." I said, "Well, what's going on?" He goes, "Man, I can't focus. It really bugs me, you know? The teacher talks and, you know, I listen for a second, and then I'm fidgeting." And for a 13-year-old kid, a boy, to tell you that, he knows it's something serious, right? So I told him, "Okay. That's a dopamine problem. You have lower dopamine. So you have a faster COMT gene, which we talk about in the book, "Dirty Genes." And what we need to do is get more protein in you so you can get adequate tyrosine, which your COMT gene will use to make your dopamine. And then you will think better."

And he goes, "Oh, okay. So I need to eat more protein?" Yeah. And I said, "Eat more protein, which I've been telling you all the time because you're a carb junkie. And when you're not eating enough protein, take some tyrosine. Take 500 milligrams of tyrosine to also support the production of your dopamine." "Got it." He did that. Great. The kid is basically a straight A student. He might get a B every now and then, but he's excelling in school. That's how I utilized genetic testing. I don't say, "Hey, you have a faster COMT gene genetically. You need to take tyrosine," because that wouldn't work because he could be focused in school. He could be performing. He could be doing really, really well. If I gave him more tyrosine, then I could make him very irritable, anxious, and causing insomnia, which is what happens when you treat the snip and not the person.

Katie: Yeah. I love that you make that distinction. And I think, I just read, actually, I read "Dirty Genes" last night. And I think it really does break it down well because like I said earlier, I think there's a lot of misinformation out there. But I want to touch a little bit more on the miscarriage connection because I know that's one I've personally gotten a lot of questions about because my audience is largely in that phase of life. I know that right now that there's a little bit of knowledge about it in conventional medicine. And I've had friends who had to have three miscarriages before their doctor said, "Oh, okay. Now the protocol says we can test you for this," but can you explain like why there can be a link there? And is it a better idea if someone has had a miscarriage to test that before they have three? Or what can someone do, even if their doctor may not be up on that?

Ben: Well, a great question. So test for MTHFR, you mean, or test for what?

Katie: Yes. I'm sorry, test for MTHFR because I know that's something you've talked about and that there could be a potential link there, but I'd love it if you could go a little deeper on that.

Ben: Yeah, I can go way deeper because this is actually my next book. My next book is on preconception and pregnancy and what to do right after. So I'm really excited about it. I couldn't write it first because first, I had to clean up the mom's and dad's genes, right, the future mom's and dad's genes before they get pregnant. So we do that. And then so the first people before they, you know, get pregnant, they read "Dirty Genes." And then they will be reading the next book, which will be coming out, hopefully, probably 2019.

But to answer your question now, there are a number of genes which increase risk of miscarriage. There is nitric oxide synthase, which we talk about, NOS3, in "Dirty Genes". There is MTHFR, which we talk about. And there is PEMT, which we talk about. So the three really, really important genes. And there's another one, which I do not talk about, and that's factor five, F5. So a factor five laden is pretty common. That increases clotting. So if you have a combination of MTHFR and factor five, your risk for miscarriage goes way up. If you have a combination of MTHFR and PEMT and NOS3 and factor five, it goes way up.

So you can go and get genetic testing for these. That's true, you can. Now, is it necessary? No, it's not. What's necessary is to understand first of all why is a miscarriage happening. Is it hormonal? Is it nutritional deficiency? Is it nutritional excess? Is it environmental exposures? You know, is it the nutritional supplements that you are taking are very, very inferior, like folic acid? Folic acid will cause a big problem. There's another gene, which is not talked about really ever, and that's the DHFR gene, which is dihydrofolate reductase. And that's the first gene that will handle folic acid. So folic acid will come into DHFR and be processed. The problem is there's a huge range of performance in DHFR just like there is in MTHFR that doesn't work. So if you have a combination of DHFR and MTHFR and you're taking folic acid, your folic metabolism is wrecked.

And think about what is going on in pregnancy or yeah, what's going on in pregnancy? You are supporting yourself as a woman, you have to have your own cells healthy and your own mind healthy and your own detox and all that. Your usual day-to-day body systems have to be working for you. Then you have to be strong enough to support the development of an entirely new organ, the placenta. Then you have to be handling the huge amount of new hormone loads that you are producing, which is not your normal self. Then you have to be dealing with a developing baby, which is using up a ton of nutrients. So there's four major things going on, your own health, you've got a huge increase in hormones, the new organ development, and a developing baby. Four highly, highly demanding systems going on.

So a recurrent miscarriage, there's something broken in that series of four. Is it blood flow? Is it, you know, lack of blood flow? Is it clots? Is it nutritional deficiencies? Is the cell membranes is not forming? Is it toxicity? Is it too many chemicals? You know, so we have to figure that out. So I'm not really a fan of genetic testing unless people have done their foundation work. And in the book "Dirty Genes", you don't even have to have genetic testing. And I don't want people supplementing either. I keep saying throughout the book until about page 280, I said, "I don't want you taking supplements until you do all this stuff because it's gonna cloud how your genes are actually working."

Instead, what I want women and men because men are also very, very important for pregnancy, is I want

them to focus on their cleaner lifestyle. I want them focusing on reducing stress and I want them focusing on real nutrients. Folic acid is not a real nutrient. It was great when that was all we had, but we have more now. We need folitic acid and methylfolate. Folitic acid is used for DNA base synthesis in your blood, your immune cells and your red blood cells and your platelets. You need folitic acid for that. You need methylfolate to support your methylation. And much of your methylation is used up to support cell membrane formation.

And what can happen if the body cannot make enough cell membranes? I mean, just think of what the placenta is. It's a massive amount of cell membranes. What is the baby? A huge amount of cell membranes. Where there's one cell, it divides to two. It divides to four. You know, it just keeps dividing like crazy, which is using up a ton of phosphatidylcholine, which is what that PEMT gene makes, which MTHFR helps support. So instead of worrying about the genes, I say, "Look. Support with real folates, eat your salads, and supplement with methylfolate and folate acid. Support your choline metabolism. You can take phosphatidylcholine directly as a supplement. You can also eat eggs, if you tolerate them and you're not a vegan. And you can also support things like carotene metabolism is also very important."

And carnosine, which is a great antioxidant, you can support with glutathione prior to pregnancy and possibly during, but it's not researched. Nobody really knows the safety of glutathione. So I'd much rather people just focus on their core nutrition and their core health prior to getting pregnant, rather than worry about genetic testing because once again, what's gonna happen? The genetic test, I guarantee you, if they don't have MTHFR, you know, a polymorphism or a snip, they'll say, "Oh, I can take folic acid," or they will not care more. They won't work as hard about eating leafy greens or supplementing with ACTi folates. If they don't have a NOS3, a nitric oxide synthase genetic problem, they'll say, "Oh, my genetics are clean."

But you know what? That's a piece of paper. That's your gene. That's the lights in your house, you know. You have to control how these genes work. And that's your lifestyle, diet, mindset, and environment and your perception thereof. So I'd rather people not do genetic testing prior to pregnancy, unless they've done the fundamentals again. Because what happens so very often is they say, "God, Dr. Lynch. I don't have MTHFR. I don't have NOS3. I don't have PEMT. And I don't have DHFR. All those genes are clean." Well, I don't care. It's your environment and it's your lifestyle that's dirtying them up.

So clean that up, support it, and things will change. And I cannot tell you how many women across this amazing planet of ours are using our prenatal and seeing their recurrent miscarriages stop. And then they get pregnant, they continue the prenatal, they have a beautiful baby, and the baby is doing healthy and thriving. It's because our prenatal contains the active forms of nutrients that they need. And it's the core. Is it based upon genetics, research in epigenetics? Yes. And does it support the individual, regardless of what genes they have? Yes. So that's how I like to go about it.

Katie: Yeah. And I can certainly vouch for that. I've used your prenatal with my last two pregnancies and I felt great on it, but you also highlight something that I've written about several times, which is that you can't out supplement a poor diet or a poor lifestyle. So I love that you really drill that down in the book that this is a great tool. And obviously, you know, prenatal vitamins are a great thing when you're pregnant, especially if they have the right forms of the nutrients. But they don't ever take the place of a really high-quality diet, lots of nutrients, and especially sleep and all of the other factors that you talk about.

So I love that you really hammer that home, but so basically, if I'm understanding, if someone has done all of these things and they are really trying to, you know, make sure they have a clean lifestyle or they're eating

really nutrient-dense foods and they're still having recurrent miscarriages, that might be a time that they could really look into genetic testing and use it appropriately.

Ben: Yes. Absolutely. Yeah, absolutely, because if you have a combination of MTHFR and factor five laden, you know, you might need to be looking at anti-blood clotting medications or baby aspirins. You might need to take, you know, step up the intervention a little bit, you know. There's also other genes which I have not researched yet, but I will be. I want to be looking at hormones, I want to be looking at progesterone. I know estrogen pretty well, but I want to look at more progesterone and oxytocin and all these other ones, but I haven't gotten there yet. I will, but yeah, I highly recommend that they do genetic testing.

The problem is, is finding a health professional who understands the intervention to take that's appropriate. You know, the guidelines, the official guidelines, I think it's the American College of Medical Genetics, they say MTHFR is not important. The standard recommendation that they use is to say, "Take folic acid and don't worry about it." That's totally wrong. It's total nonsense. And I have videos on YouTube for free. You know, "Folic Acid and Pregnancy" is a great video to watch, which goes through why folic acid is not recommended, and I use published research to explain why. And I also have a case of a woman who was struggling with recurrent miscarriage who was taking high amounts of folic acid and was still miscarrying. So it obviously doesn't work for everyone.

Katie: Yeah. That's a great point. And I've gotten a question as well, like a lot of people asking, "If I don't have an MTHFR mutation," and like you mentioned, you touched on this earlier, but I've gotten this question, so I want to specifically have you answer it which is, "Is there ever a time and a place for folic acid?" Or even if someone doesn't know if they have a polymorphism or if they know they don't have one, can they still just opt for the methyl folate form?

Ben: Great question. So I hear a couple questions in there. First, I'll simplify the question a little bit and say do I ever need to take the supplement folic acid? No. No, you don't. Our ancestors, humans, have been on this planet for a long time. I don't even know how long. You know, hundreds of thousands, millions of years, I don't know. That amount of time is a long time. And the humans have been here reproducing very well. We wouldn't be here if not. Folic acid was introduced in the late 1980's as a solution to destroying the nutritional content in grains in order to preserve and extend shelf life of processed food.

Because what happened was, you know, the industrial revolution said, "Hey, we want to make money. We can't make fresh bread every day. It's not scalable. We need to be able to transport it and have a whole bunch sitting on the shelves." And they learned that if they stripped the nutritional content out of the grains, then it will sit there longer. Women were having recurrent miscarriages left and right. They would have neural tube defects left and right. They'd have congenital birth defects left and right. And they're like, "Oh, my God. This isn't good. What do we do?" Instead of going back to what nature provided and say, "You know what? That was stupid of us. We need to not strip all the nutritional content out of food, and let's just put it back and we'll go back to making fresh bread and fresh grains and so on," what they did is they synthesized folic acid and they threw it into the bread.

And yes, that helped some women, for sure. Neural tube defects did go down, recurrent miscarriages did go down. But not for everyone, a small percentage. And some percentages higher, depending on ancestry. So my point is if nature was providing us real folates and humans decided to synthesize a nutrient that is not utilized physiologically at all by the body, unless it's transformed by various genes, there's no point to take it.

Especially now that we have active forms of folic acid, which is also called calcium folinate, which I describe my video, "Folic Acid and Pregnancy". And there is methylfolate, which is readily available, as well. And we have leafy green vegetables. Folate stands for foliar, which stands for foliage. So eat your foliage. Get your foliates. And you know you never, never need to take folic acid.

Now the next question is, "Well, I can't tolerate methylfolate. I don't do well with methylfolate." Okay, well, there's an article on [mthfr.net](http://mthfr.net) called "Preventing Methylfolate Side Effects" that you can reference. Usually, it's an electrolyte deficiency. Usually you're taking your methylfolate without protein or food. Usually you're getting adequate folate anyway in your diet and you don't need it. Usually there's, you know, a lack of sleep or the lifestyle things are in play or there's chronic infections going on, as well. So all these things are major reasons why I don't tolerate methylfolate. So the solution is to either not take methylfolate or folate in general. You just get it from your food or you can try folic acid, which is an unmethylated form of folate and see how you do with that. If you do well with that, great. And some days you will need more folic acid than others. And other days you'll need some methylfolate.

Look, I don't take...I have a pretty dirty MTHFR genetically. I was born with a slower dirty MTHFR. You know, its capacity functions at about 30%. That means 70% function is lost, compared to the typical person who does not have MTHFR. But I eat my salad. I don't drink alcohol, very, very rarely, I mean, like once every couple months. And I get my sleep. I get my water and exercise. You know, I take care of myself. And then I'll supplement with methylfolate, maybe 400 micrograms every day, maybe every other day. And so we need to understand that, again, genes do work. And if I travel or I'm doing a presentation or have a huge workload, then yeah, I'll take more folate. If I'm on vacation, I probably won't supplement at all.

Katie: That's a good distinction. And I know you have a whole bonus chapter on this. And I want to talk about it, kind of just circle back and leave people with the practical and the positive because I think that's what "Dirty Genes" does a great job of. So let's talk a little bit about the practical ways that we know that environment can affect our genes and what are some ways we can protect our genes. And, of course, I'll link to your website where you have that "26 Steps to Clean Genes" for anyone who wants to download that, but can you kind of walk us through a few of them?

Ben: Yeah. So the 26 steps are the ABC's. And I was trying to keep this very, very practical and actionable and understandable because any time you enter the realm of genetics and epigenetics, it's like, "Oh, my God," and you literally turn off and walk away. So it's not hard. It's not hard. So the 26 steps are the ABC's, and I'll mention a few of them. Avoid. Avoid what? Avoid the things that don't make you feel good, and specifically chemicals. If you are inhaling chemicals, air fresheners, cleaners, toxic soaps and shampoos, car exhausts, you know, non-organic, dirty dozen foods, these things are bringing in a ton amount of chemicals into your system, which then your genes have to clean up.

Again, genes do work. So if you bring in all that work, then your genes get loaded. And your genes have to use your vitamins and minerals and other resources to perform. And if you're not able to have those resources available for various reasons, then you're gonna get symptoms. So the best way to support your genes, number one, and I'm glad it's letter A, is avoid. And also avoid stressors. Avoid the news. I haven't watched the news in probably a decade. Now, you know, I still vote for presidents, even though we didn't have a really good choice last year. You know, I didn't like either personally, but there's things that you have to do in life. And avoidance is perfect. Is there an individual that is causing you problems? Then avoid them. Just say, "You know what? We've moved on."

And this happened to my wife the other day. And she was really in tears over it. And I said, "Nadja, look. Every time you used to see her, you would come home crying anyway, every time for like the past five years. So how is that... and you're always walking on tiptoes when you would have this friend over or you went to her house or you'd try to go to sauna or you'd go on a bike ride, you always were filtering what words came out of your mouth. And that was causing tremendous amounts of stress. And no matter how careful you were around her, she still tore into you for some reason. And she had no right to. So this relationship is finished. And I am thankful for it. So you need to find these toxic relationships. Just because you had a friend in third grade and you're now in your 40's, you know, you've moved on. And so have they. It's okay to be different." So cut out those toxic relationships. Avoid them. And avoid the stressors. This is really, really important. That's number one.

Number two is breathe, which is also incredibly important. If you are, you know, exercising right now or you're just listening, focus on your breath right now. Is your stomach moving forward and out or is your stomach flat? Go ahead and put your hand on your stomach. And is it even moving in and out? Mine is, even though I'm sitting. It's harder to breathe when you're sitting than when you're standing. So if you're breathing from your chest or your neck up, that's a shallow breath. Are you holding your breath? Are you sitting there with your mouth open? Is your mouth open right now? Mine is because I'm talking. But if you're listening, your mouth should be closed and you should be breathing through your nose. And your nose should be clear. If it's not clear, are there food intolerances? Are there environmental issues? Your sinuses should be clear. Mine is clear. I can breathe through my nose. Every day, I clean my nose either with a Neti pot or I just put my hand under some water when I'm in the shower because I have a shower filter because I avoid chlorine in the shower. Avoidance.

So I take a cup full of water while I'm in the shower and I gently snort up a little bit of water and I blow it out the other side. Graphic, excuse me, but I keep my sinuses clear, morning and night, even a few times during the day. So breathing is very, very important. There is something called email apnea. And email apnea is a big problem. People will sit in front of their computer and hold their breath. If you find yourself yawning recurrently, that's a sign. If you find yourself sighing often, that's an issue. So sleeping with your mouth open, that's an issue. These are all very practical because if you're without oxygen for three minutes, you're dead or you have severe brain damage. So we have to focus on the basics.

Chemicals too much, you're dead. So I'll stop at C. Chewing is the letter C in the ABC's. If you're not chewing your food, that's a problem. My oldest son has a snake. Watching him eat, I want to take a baseball bat to his plate and just tell him, "Hey, slow down. It doesn't work that way." Your stomach doesn't have teeth, your pancreas, neither does your gallbladder or your liver or your small intestine. There's no teeth there. You have teeth in your mouth, you've got them. Use them so your stomach acid can get around there and digest it and absorb it so the pancreas can squirt the bicarbonate and the pancreatic enzymes so it can process it, so it can absorb it, so your bile can then squirt on the fat-soluble foods and absorb the fat-soluble nutrients. If you're not chewing your food, you're not absorbing your food.

Food first is fuel and nutrients. That's why we eat. We don't eat because it tastes good and because we want it or crave it. We eat because our body needs fuel and tools so our genes can do work. So those are the top three or, you know, the first three and then there's 23 others that are just like that.

Katie: I love it. And anyone listening should be able to buy "Dirty Genes" anywhere books are sold, but please

let everybody know where they can find you online. If they're listening now and want to find out more, where can they find you in the online world?

Ben: The online world, drbenlynch.com. And my Facebook is very active. We have a Facebook Live once a week. In fact, I'm going there right after this, after I walk around a little bit because I've been sitting too long. But we have a Facebook Live once a week. And the Facebook Lives are very engaging. I include you and they're very fun. And we record them and put them on a page for later viewing. And our YouTube channel is not as populated right now because we're remodeling our house. But once we get back in, I'm gonna have my video studio up. But there's a lot of resources on there, but you can link through those right through drbenlynch.com. And then on my online supplement company at seekinghealth.com where we've got formulations that are based upon my research and they're helping a lot of people.

Katie: Thank you so much. And of course, all those links, you mentioned quite a few articles. All those will be in the show notes at wellnessmama.fm for anyone who is looking for those. Dr. Lynch, thank you so much for your time and for being here and for all the research you do.

Ben: Thank you, Katie. And thanks for interviewing other experts and practicing what you preach. And, you know, what you're doing is helping a lot of people, as well. So I thank you for it. Keep going. And stay healthy. If I can help you in any way, let me know.

Katie: Thank you so much. And thanks to all of you for listening. And I will see you next time on "The Healthy Mom's Podcast".

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