

# **THE** MODEL **HEALTH** **SHOW**

**EPISODE 632**

## **The Surprising Science Of “Gut Feelings” & The Truth About Colonoscopies**

**With Guest Dr. Emeran Mayer**

You are now listening to **The Model Health Show with Shawn Stevenson**. For more, visit [themodelhealthshow.com](http://themodelhealthshow.com).

**SHAWN STEVENSON:** Welcome to the Model Health Show. This is Fitness and nutrition expert Shawn Stevenson, and I'm so grateful for you tuning in with me today. On this episode, we're going to be talking with a world-renowned gastroenterologist who's been in the field for 40 years, for four decades, and he's going to be sharing some insights about the actual root of the gut brain connection and the surprising way that this system actually works. Now, the enteric nervous system, this is often referred to as the second brain. If we're talking about the gut, i.e., the enteric nervous system. There's a vast array of neurotransmitters that are just permeating the gut and also being produced within the gut that are similar to what's happening in our brain. So, it has that very obvious connection. But today, you're going to learn how certain issues taking place in the gut. If you essentially go and cut that connection, a certain nerve connection from the gut to the brain, you can essentially cut off this manifestation of this disease in the gut. Is that a good thing? We're going to talk about that as well.

And we're also going to be talking about the science around gut feelings, right? There's this very popular term in our culture, obviously, of gut feelings, but we're going to talk about the science behind it. Is this a real thing? Is there any vital feedback that this can give us? Is there any way that we can possibly, if this thing is real, be able to cultivate and improve our gut feelings? So, lots of good stuff to look forward to in this episode. And again, this is essential information that every single human being should have access to. And this is why we do what we do to be able to provide this information that oftentimes many of the things we're going to be talking about, this is cutting edge, publishing the most prestigious peer reviewed journals, but the public at large will not get access, or this will not be baked into popular culture for years, possibly, you know, a decade plus before people actually know about this information.

This is why mediums like this are so important. So, make sure that you are subscribed to The Model Health Show on your favorite podcast platforms. And also, on YouTube. We have exclusive content there that we're releasing every single week, and it's just helping to really push this mission forward to where we have the very best people in their respective fields here featured on the show. And the impact in reach is slowly but surely starting to overtake "major media." And this is so powerful because again, if you look at the underlying mission and behavior patterns of popular media, being a culture that's driven by fear and utilizing very primitive, manipulative tactics to disempower people in order to keep eyeballs. To disempower people, to instill fear, in order to keep people hanging on every word and invested in their content, whereas we're doing the reverse. We're putting the power back into your hands we're

reminding you that the power was always in your hands to begin with, with a modus operandi of empowerment.

And so, again, I'm just so excited about this and so excited about this time, and I'm very grateful for you being a part of it. Now, in this conversation about the microbiome, of course our special guest is going to emphasize the importance of diet in how it influences our microbial health and also our gut health overall. But the shift that can take place with our microbiome, how quickly it happens when you learn about that, it's probably going to blow your mind. And so, with that said, our nutritional implementations, you know, our diet framework is going to have a huge impact on our gut health and our microbial cascade. Absolutely. And our overarching diet is clearly going to be the most dominant influence, but there are storied things that's been utilized for centuries, oftentimes thousands of years by our ancestors that are now proven to help to facilitate healthy microbial communities and to even help to shift and improve the dynamics of our microbiome, reducing things like dysbiosis that have become so normalized in our culture today. And one of my favorite things is a long renowned fermented tea.

In a recent study published in the peer review journal, Nature Communications uncovered that there's a unique compound in this tea called theabrownin that has some really remarkable effects on our microbiome. This tea is called pu'er and the researchers found that theabrownin positively alters our gut microbiota and directly reduces excessive liver fat, right? So, the creation of new fat also. And this being something called lipogenesis. Another study published in the Journal of Agriculture and Food Chemistry found pu'er may be able to reverse gut dysbiosis by dramatically reducing ratios of potentially harmful bacteria and increasing ratios of beneficial bacteria. Now the key here is making sure that we're getting a high-quality source of pu'er. And for me, this is going to be coming from Pique teas. Go to [pikelife.com/model](http://pikelife.com/model). That's P-I-Q-U-E-L-I-F-E.com/model. You get 10% off all of their award-winning teas, including their cold extraction pu'er. Now the cold extraction technology that they're utilizing, this is a patented technology, utilizes cold to low temperatures for up to eight hours to really extract all of the vital polyphenols and antioxidants.

And our special guest is also going to mention, these phenols and how important they are, but being able to extract those compounds that we're really looking for, providing the very best concentration. Plus, they're doing a triple toxin screen for the highest level of purity. 'Cause a lot of folks don't realize this, but teas are one of the most contaminated substances. There's so many valuable things to be able to get from teas, but the industry is just not very well regulated. So microplastics, pesticides, heavy metals, toxic molds, Pique tea, is really in a league of their own in being able to screen for those things to make sure you have the highest level of purity and all the good stuff that you're looking for. Again, go to [pikelife.com/model](http://pikelife.com/model). That's P-I-Q-U-E-L-I-F-E.com/model for 10% off store wide. Now let's get to the Apple Podcast, review of the week.

**ITUNES REVIEW:** Another five-star review titled, "Amazing Podcast for the Health Conscious," by Vegan Egan. "You don't come across people like Shawn too often in the health and fitness space. Very objective, knowledgeable, and practical. Thank you for all that you do."

**SHAWN STEVENSON:** Amazing. Thank you so much for sharing that over on Apple Podcast. You put a huge smile on my face. I appreciate you immensely. And on that note, let's get to our special guest and topic of the day.

Our guest today is Emeran Mayer, MD and he's been studying the mind, brain, body, interactions for the last 40 years with particular emphasis on the bidirectional communication between the brain and the gut and its microbiome. He's the executive director of the Oppenheimer Center for Stress and Resilience and the co-director of the Digestive Diseases Research Center at UCLA. He's the author of more than 300 scientific publications and also two best-selling books as well. The Mind-Gut Connection and the Gut Immune Connection. He has appeared in a variety of major media outlets, including NPR, PBS and also in the documentary In Search of Balance. And his work has been featured in Scientific American Time Magazine, The New York Times, and many other outlets. And now he's back here on the Model Health Show to share his brilliance. Let's jump into this conversation with the amazing Dr. Emeran Mayer. We have a legend here in the model health studio, Dr. Emeran Mayer, welcome back to the show.

**DR. EMERAN MAYER:** Yeah, thanks for inviting me. It's a pleasure to be here again.

**SHAWN STEVENSON:** Yes, it's always great talking with you. You're always so insightful. I would love to start with literally going from top to bottom and detailing what are some of the nuts-and-bolts ways that the brain is literally connected to the gut? How does that interaction really work?

**DR. EMERAN MAYER:** So, the fact that it does work has a lot to do with evolution because, in evolution we started out with, or organisms started out with a flowing digestive tube with some nerves wrapped around that tube. So that was our first nervous system, and it took care of both contractions of the gut to regulation of the gut. But also, fight or flight response and digestion. So, everything was in this one very primitive nervous system. Then as animals evolved and developed a polar brain that then started to take care of the things around us, not just digestion. There was a division of labor, some stuff stayed in the gut, became the so-called enteric nervous system or little brain of the gut, or it's also called the second brain, even though it was the first brain and our central nervous system that took care of everything else.

And obviously, even though there was a division of labor, they stayed very closely connected those two systems. So, it's almost like you can say these are not separate entities, it's part of the same theme of regulation of complex functions. So now when does the brain have to sort of talk to the gut? Anything that happens in the gut, the contractions, the digestions, the secretion of fluids, the absorption is actually taken care of by our ancient system, the enteric nervous system. As long as things go normal, if something goes out of balance with the whole person, the organism, then the brain kicks in and tells the little brain in the gut, you know, you need to change that. So that happens with under stress, during different emotions. So, we can almost say that every emotion that we perceive consciously or even those that go on without our conscious awareness, they have a mirror image in the gut because the brain sends that information to the gut and adjusts the gut's function to that emotion.

So, if you are angry, essentially, the brain creates a different baseline in your gut, not a good one for your digestion. Same with when you're anxious, if you are in a fight and flight situation, very severe stress, then what's good for the body overall is that you empty the gut, so no calories are needed to run digestion and all the energies goes to your skeletal muscle, to run away or to fight. So, you want to... It sounds kind of gross, but you want to empty the upper part through vomiting or nausea and vomiting. You want to empty the lower parts through diarrhea. So that's a classical...

**SHAWN STEVENSON:** What if both are happening at the same time?

**DR. EMERAN MAYER:** Yeah, and that does happen. I have patients. So, if that fight and flight response is triggered inappropriately, because very few people have to run away from a tiger, even though it does happen, like the recent story from India where this tiger ate nine people...

**SHAWN STEVENSON:** Yeah, no big deal.

**DR. EMERAN MAYER:** I know.

**SHAWN STEVENSON:** Oh my gosh.

**DR. EMERAN MAYER:** But so, this flight and fight response is still triggered inappropriately, if you have a lower threshold, so this whole stress responsiveness, which is highly variable between people, then these signals from the brain to the gut have that effect. Now we talked a lot about the top down, there's also the bottom up.

**SHAWN STEVENSON:** Right.

**DR. EMERAN MAYER:** So, this came up when I started my training and research decades ago. It was found that the... So, there was a lot of interest in the vagus nerve, the function of the vagus nerve, mainly because the vagus nerve played a big role in peptic ulcer disease, and surgeons found out if you cut the vagus nerve, then... That's a traumatic but effective treatment for recurrent, chronic peptic ulcer disease. I mean, obviously we no longer... Thank God we no longer do this today, but a lot of research went into the vagus and it became clear 90% of the fibers of this nerve that innervates every cell in your gut goes to the brain from the gut to the brain. 90%, only 10% mediate these signals talked about earlier, the fight and flight response or the emotions. So, the question that was not answered at the time is, why do we need 90% of this capacity send signals to the brain? So today we know it's the largest stuff happening in the brain that... In the gut, that the brain needs to know. For example, with a simple thing, if we have eaten a meal and we feel full and satiated, that's a signal generated by cells in the gut and transmitted via the vagus nerve to the brain.

But now we have the microbes, we have 40 trillion microbes, and they produce all kinds of things and interact with virtually all the cells in the gut, including this satiety hormone containing cells. So now we have an explanation why we need such a complex communication system bottom up from the gut to the brain. And we're still trying to figure out what goes on in these pathways. 'Cause I would say in terms of the microbiome signaling to the brain, we're still in its infancy. There's millions of genes that express certain things. Only a few of those we know what they are, what molecules they are, and we know even less of what they do. So, brain gut communication, summarize that is a circular system. The brain always talks to the gut and the gut always talks to the brain. And it's a circular communication that... So, I don't call it a brain gut access, but really a brain gut system where we have to apply systems biology, network science to understand it. It's not a simple linear thing. You have this one nutrient entering the gut and then something happens. It's always like in that circular motion. And that's why it's been difficult to come up with medications or interference with that. You can imagine, figure out what 40 trillion microbes have to tell the brain. And now you figure out what's wrong in the disease, complex disease like depression or Alzheimer's or autism spectrum.

**SHAWN STEVENSON:** Like we got a magic bullet.

**DR. EMERAN MAYER:** Yeah. And that's probably not a magic bullet. It's probably you have to have a combination of things, you know?

**SHAWN STEVENSON:** Right. Magic bullet is that's idiocy to think that you could have that.

**DR. EMERAN MAYER:** The magic bullet approach that worked for the peptic ulcer, but that was one of the few things.

**SHAWN STEVENSON:** But even with that, that's exactly the thing I was going to mention. There's a reason that that occurrence was happening. Right? And this is something you just turned on a light bulb in my mind. Like I never thought about this. By cutting that nerve, which you said is a very effective means for treating that condition. The question is why if the brain is in this connection between the brain and the gut, obviously stress and or other emotional components stuff going on was contributing to this outcome in the gut. And so basically, you're just cutting off that stress signal in a sense. Is that correct?

**DR. EMERAN MAYER:** Yeah. And there's another example from peptic ulcer H. Pylori was discovered.

**SHAWN STEVENSON:** Right, yeah.

**DR. EMERAN MAYER:** And then people said, "Oh, so we no longer need to." There was a lot of research going on at the time, was early on in my career what we were interested in, the effective stress on in peptic ulcer in the start and in the flare up. But the minute H. Pylori was detected or identified and then it could be eradicated with an antibiotic, that entire interest in any other factor stopped. And it's very interesting because there are lots of studies, the stress still plays a big role and I'm surprised. Well, it's because H. Pylori is a big money maker. You don't... Industry is not interested in pursuing this any way further. But people that had H. Pylori, the majority of whom this was one of the most common infections, most humans and certainly our ancestors all had H. Pylori. And it had benefits for us.

This was a synergistic relationship. So, studies show, the early studies showed that the majority of patients with H. Pylori do not develop an ulcer. And the factor that determines that high risk population are the ones with the stress. So, stress needed the precondition of the microorganism to create the ulcer. You know? But obviously nobody would go into therapy or cognitive behavioral therapy for an ulcer treatment. It's just... And what we've ended up with this is the side effect of this limited approach or this linear approach. So, we eradicated H. Pylori, there's some people, even the people that were pioneers in that research field are now saying this was not a good idea because the interaction with H. Pylori trained our immune system early on and getting rid of this training is one of the reasons why we have an increased rate of allergic disorders and autoimmune disorders.

**SHAWN STEVENSON:** Yeah, it's skyrocketing in recent years.

**DR. EMERAN MAYER:** Skyrocketed. And it's surprising to me, nobody brings that up with H. Pylori. We're still happy, the medical system totally happy with that approach. And now in the US for example, it's almost completely eradicated, and we have one of the highest rates of

these autoimmune diseases. And I mean there's obviously other factors. Like we also throw antibiotics for other reasons at young children.

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** Doing the same things.

**SHAWN STEVENSON:** Even for viral conditions.

**DR. EMERAN MAYER:** Yeah, for the viral.

**SHAWN STEVENSON:** It's not uncommon.

**DR. EMERAN MAYER:** So, we've essentially taken away that whole, you could say... Like the university or the training system for our immune system by throwing... By killing all these microorganisms early on in life. It has no opportunity to differentiate between something harmful and non-harmful.

**SHAWN STEVENSON:** Yeah, this goes back to that network theme that we were talking about earlier when I said the term, for example, magic bullet. It's seeing the effectiveness of, let's go ahead and destroy H. Pylori without understanding how it's affecting the entire network.

**DR. EMERAN MAYER:** Yeah, exactly.

**SHAWN STEVENSON:** Or going in and snipping that vagus nerve and getting this one result, not understanding how it's influencing the whole network. And when you mentioned earlier, you mentioned millions of genes, you're referring to our bacterial genes. So, we've got trillions of bacteria, they have genes too. So, if we're going...

**DR. EMERAN MAYER:** So, this is... Yeah, this is what I meant. So, we humans have 20,000 genes, which is almost nothing compared to the microbial gene pool, which is in the millions, so...

**SHAWN STEVENSON:** Most of our genes are not human.

**DR. EMERAN MAYER:** Yeah, yeah. So there used to be, in the beginning on this field, people always emphasized we have 10 times more microbial cells than human cells. I mean, that is no longer true. It's about the same number. But in terms of the comparison at the gene level, it's even more extreme, 100 times, several hundred times more microbial genes than human genes.



**SHAWN STEVENSON:** Yeah, so fascinating. And all of this is interacting, because we're talking about epigenetics and how those conditions for our bacteria are influencing what our human genes are doing.

**DR. EMERAN MAYER:** Yeah. So, there's... This is the topic that I'd mentioned to you. So, I recently... I mean, I've had a long dialogue with this colleague of mine, Steve Cole, professor at UCLA, genius. And he has created this field of social genomics. And in a nutshell, what he... So, this is different from epigenetics. Epigenetics means you change the gene expression profile permanently or for a long time if something happens early in life. And that gene functions different than if that had not happened, with a configuration that stays. Now what Steve has shown is that conditions at different network levels... So, he looks at social networks, our social interactions, he looks at networks of human cells, then networks of genes, networks of microbes. You have to imagine these are different levels. What he has shown that this is... This integrative interaction of all these networks. So, it's complex at each level, it's... But then, this interacts all the way down to the microbes.

So, something happens in your social network such as new studies, social isolation, even the sense of happiness, there's this eudemonic happiness when you do something for others or do something with a higher purpose as opposed to your own satisfaction of your materialistic wishes. That that has a different effect top down on your gene network, that creates a gene network that is beneficial for your body, or your function. So, health is determined by what trickles down from the top to the bottom. And subtle things like this. I mean, so many people particularly in the US, happiness is material things. They've done studies to compare that happiness with the eudemonic happiness, and the material... The satisfaction of material needs and wishes has no positive effect on your gene expression pattern. Whereas the eudemonic one has a very strong effect. They've also shown that, for example, meditation and mindfulness and compassion in various sophisticated studies, that all these have an effect on these gene networks, which then affect health outcomes. So, it's a fascinating science where you can measure... I mean, people have always sort of said this, "Yeah, if you do good things for others, it's good for your health." But that you can actually measure this at the genomic level...

**SHAWN STEVENSON:** Is powerful.

**DR. EMERAN MAYER:** Is amazing, at the molecular level, you know?

**SHAWN STEVENSON:** Yeah, it's very exciting. And this is the thing that I love about being alive today. We have scientific method to affirm certain things that we experientially know to be true, but we're able to affirm that with science. And then that starts to bake itself into healthcare. Eventually, it takes a long time for healthcare to change and integrate some of these new findings, but this is a great transition into longevity, in that equation. If we're

looking at the places around the world where people are living the longest, but not just their lifespan, but their health span. And we see, obviously, there's a variety of different diets. There are principles, of course, tenets of real food, movement patterns, but those things are not in a silo. The overarching thing that just tends to stand out in the research is the social interaction.

**DR. EMERAN MAYER:** Yeah. And again, I've been talking about networks, so you could almost say lifestyle networks, healthy lifestyle networks. It's not the one thing so... And again, in science, we focus on one thing. We focus on diet, the huge epidemiological study. If people that are on a Mediterranean diet, do they live five years longer than those that are on a standard American diet? I mean, that's kind of interesting, but it does not really relate to reality, 'cause in places like in these Blue Zones in Sardinia, this interaction of their genes with their lifestyle, with their mindsets, which way are they happy? Are they these eudemonic happiness principles or... And all these interact and probably contribute, I would say, relatively small individual percentages. I don't think...

As we... Now with all the chatter on the internet and then the commercial interests that jump on it, that you have this supplement, and this supplement gives you five more years of healthy living. It's absolutely ridiculous. And then there are these examples I mentioned to you before, sort of been intrigued by if you look at obituaries, you don't do this when you're younger, but at a certain age, it's kind of interesting, that a lot of people that were familiar names when you grew up, musicians, artists, so all of a sudden, they pass away. And what I've noticed that a lot of people pass away at fairly high ages, you know, 96, 100. And for some people, it's probably not a coincidence. But I doubt that the majority... Like, you never read this, that I doubt that the majority of these people practice the kind of lifestyle that we promote today with the daily exercise and the meditation.

**SHAWN STEVENSON:** Yeah, the alcohol... Yeah.

**DR. EMERAN MAYER:** Most of them have never done that. They may even have... Be overweight... So, you really question, I mean, what is it ultimately? So you could be, a person says, "It's all in the genes." There are some people saying, "Sardinia, this is a different gene pool, and they've always lived into old age, and it doesn't really matter what they do." I once, my young days, backpacked through Ecuador, and went to a place that was written up in the National Geographic as this place with the oldest people in the world. This was long before the Blue Zone concept. And so, a friend of mine and myself, we went there, and we visited these people that lived very simple village. And then we spent a week with them and saw how they lived, and they worked hard. They demonstrated to us, they still brought in firewood even though they were 98 years old. Very simple life, and it sort of made sense. Yeah. So, there was this pure water, you know. But then what happened, like 20 years later, I read up about this village again, and there's no more longevity. So, a lot of hotels have moved in, and it's been

completely Westernized and modernized, and the modern lifestyle has moved in, and these old people have finally passed away, and the longevity has gone way down. It's become the average. So, it wasn't the location, it wasn't the water, it wasn't... It was the overall complex lifestyle that these people had.

**SHAWN STEVENSON:** Right. This is one of the things that we tend to do. We have our cognitive biases, especially when something starts to work for us, and we start to kind of put all of our eggs in one basket. And the truth is, it's a complex thing, you know. There's certain inputs that our genes require, like they expect from us. And if any of those things are missing, what we tend to do is we get really good at one thing, for example. Like, we're really about our exercise. But if you're not minding your sleep quality, for example, the system is going to break somewhere, because it's just... It's an input that's expected. And so having that complex, as you mentioned, but most importantly I think because our culture is the way that it is today, particularly here in America, where we're missing this social component, where again, it is arguably the biggest driver, one of the biggest drivers of our health outcomes. And now we're so separate. We evolved in tribes, we evolved in community, and it went from that to neighborhoods. But even then, neighborhoods would work together, everybody would know it. Now it's just like you don't know anybody. As a matter of fact, don't talk to me. If your neighbor comes walking by, it's a sketchy situation today. You know what I mean?

**DR. EMERAN MAYER:** Yes, yes. Yeah. It's very strange.

**SHAWN STEVENSON:** So, we're very... And also even with our own core family, our families tend to get separated as well. We don't have the dynamic and the different generations working together. And these are things even just seeing the last couple of years, we've seen in some cases a resurgence of the family interconnectedness and another value placement on those relationships. So, I'm hoping that's a leverage point to get people back connected with friends and family in a whole new way, in an intentional way.

**DR. EMERAN MAYER:** Yeah, I mean, this is... It also came up in these conversations with Steve Cole, is that evolution obviously always has come up with solutions tested over millions of years, about their effectiveness for survival of the species. And so, the two things that influence our gene expression patterns in a positive way, one is social interactions, and the other one is doing something for the good of others. And if you look at the two human areas where that is happening, so we take care of our children, we're putting all the energy. So, this is one of those activities, clearly, that has been selected and reinforced by evolution, and it... I'm not sure if there are studies on that, but I'm certain that's one of the triggers for a gene expression pattern that's health promoting, taking care of somebody else, not yourself. And the other one is living in social communities. And the social community part, I think, is under

threat. It's hard to say that at the moment, what the outcome will be. I mean, you have the metaverse on the one side.

**SHAWN STEVENSON:** Right.

**DR. EMERAN MAYER:** Which is... I just recently read this article by a New York Times reporter who spent, I think, 48 hours in the metaverse and describes the insanity in that space. And a young guy basically he ran into in the metaverse, saying he spent the last 10 hours lying in bed and visiting people. And so, the question is... Can we full evolution, and does our brain think that's a social connectedness or is that a complete breakdown of the social connectedness that we are programmed for?

**SHAWN STEVENSON:** You already know, you already know, Dr. Mayer, you know. But again, here's the thing. It is, we can't stop what's already unfolding with technology and with that kind of integration pattern. But what we can do is fortify the education on how important it is to not live in the metaverse, in the degradation. Because evolution takes time, evolution takes time. And that inputs... We do have sprinklings of data about gaming and things like that. And we see beneficial components with this, like hand-eye coordination, with helping to modulate stress if you're happy gaming.

**DR. EMERAN MAYER:** Yeah. Yeah. Yeah.

**SHAWN STEVENSON:** Right? I just saw a study recently on that. It's your disposition when doing the thing, coming into it, your mindset. And if we don't have a healthy association with how to manage our own minds and also healthy social connection, because what tends to happen, even if you're gaming, you're getting pissed off with somebody you don't know.

**DR. EMERAN MAYER:** Yeah, yeah.

**SHAWN STEVENSON:** Right? On the other side of who knows where, and there's... It's missing a vital dynamic in a relationship context, that we evolved having; being able to pay attention to non-verbal cues and being able to see facial expressions, and to mirror. Because there was actually a really great study out of Princeton and they found that two people getting together and just building some rapport, that our brains start to sync up. You know, our brain patterns just kind of start to mirror each other. And we talk about that even in the realm of psychology, of mirroring in order to create rapport, we naturally do that. And so, pulling these pieces out, of course, there's going to be huge gaps in functioning. And doing it so quickly it's what's scary.

**DR. EMERAN MAYER:** Yeah. The speed is one of the main things. So, quickly reflecting back on the microbiome, so the microbes have these hundreds of millions of genes, that's their biggest

strength and they can adapt because of that much faster to changes in the environment. So, you can change your diet tomorrow and go from a vegetarian to standard American diet, and your microbiome will change within 48 hours. So, was this pivotal study on that. Now, our human genes cannot. So now, all of a sudden, these micros are processing this new food, new type of food, generate metabolites that our immune system and our nervous system has not seen before. And it will take probably 10,000 years before our genes really change. Like, they can be modified, what they express, but not the genes themselves. So, you get this mismatch. And I personally think a big problem is technology and lifestyle changes have moved so fast that our genetic machinery has not been able to adapt to that in a way that is beneficial for us.

So, you have these mismatches, and the mismatch is... Essentially rings the alarm bell for your immune system; something is wrong. It doesn't... And it's probably not a coincidence that we have this inappropriate activation of our immune system underlying now most of the chronic diseases of the last 75 years. It's an epidemic. And I think it has a lot to do, in itself... You have to prove it scientifically. And it has a lot to do with the two different time scales that our systems can adapt microbes very fast, but then generating something that the rest of the body is not familiar with and doesn't feel comfortable with. The immune system also can adapt quickly, but not fast enough to recognize that it doesn't need to ring the alarm bells in order to... So, we're not threatened if our microbes... If you switch from one food type to another, that it's something really dangerous, but... So, you can see in our conversation, we switch on these different levels of these networks that I talked about earlier. We go from the social to the health, the body, the genes, the microbes. And I think a lot of the explanations of what goes on with us as humans, it's a good way to do this in this way. Not say at one level but see the connections and see... Characterize the system's properties. It's kind of a whole new way of looking at medicine, you know?

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** Systems medicine. What are these? How are these systems coordinated and what have we done to throw them out of balance?

**SHAWN STEVENSON:** Yeah. We've got a quick break coming up. There's a natural ebb and flow of our body temperature throughout the day and through our evolution, there's a natural drop in our core body temperature at night to help us to facilitate sleep. Certain hormones are released, certain enzymatic processes for repair. Certain things change in our brain when our body temperature's going down in the evening in association with the nocturnal pattern of life itself here on earth. When things start to get darker, our core body temperature goes down. It's how we evolved. Now, today we can throw a glorified monkey wrench into that natural process.

And what the research indicates is that one of the primary thing that's underlying insomnia is an inability for our body temperature to be regulated. Specifically in the evening we're seeing folks with chronic sleep issues having a much higher core body temperature at night. And this was highlighted by a study that was published in the American Journal of Physiology. Now, a new study with this in mind was just conducted, and it included 32 participants, and they were recruited into a three-week clinical trial to see if supporting thermal regulation with their bedding can help to improve their sleep quality. Now, the researchers took subjective and objective data monitoring their sleep with devices to see the impact of their sleep conditions.

And so, the researchers utilized, some bamboo lyocell sheets, that support thermoregulation, that are antimicrobial, that are moisture wicking. And they found that, by sleeping on these sheets, the study participants had a 1.5% improvement in their sleep efficiency. What does that mean? What does that equate to? That's equating to an additional 7.2 more minutes of restorative sleep per night. Now, what if we stretch that out? We're talking 43 extra hours of sleep per year. They're still doing the same activity, still in the same bed, but not getting optimal sleep. There's a difference between getting restorative sleep and just being unconscious or just being in the bed. This simple thing, just what we're sleeping on, can improve our sleep quality. By the way, subjectively, so that was the objective data. Subjectively, the participants found that their mental alertness during the day following sleeping on these sheets improve by 25%. And overall, 94% of people prefer sleeping on these sheets, versus whatever else they were doing before that.

Now, these sheets are from Ettitude and these are my favorite... I love these sheets so much. I didn't know that this was even a thing. I didn't know that this existed, that this mattered so much. But once you sleep on these sheets, you truly understand why, they're free from harmful chemicals, irritants, allergens or hypoallergenic and also, they're self-deodorizing, they inhibit bacterial growth, they're breathable, moisture wicking, also supports thermoregulation. But something truly special because I love these sheets so much, I actually reached out and connected with these folks and I got a 15% off discount, for our audience here. So go to [Ettitude.com/model](http://Ettitude.com/model), that's E-T-T-I-T-U-D-E.com/model. Use the code model15 at checkout and get yourself some of these incredible sheets. And these are a great gift as well by the way, I get these sheets for friends all the time. I love them so much. And also, they are giving you a 30-night sleep trial. So, you get the opportunity to sleep on them, think on them, dream on them. If you don't love them, just simply send them back for a full refund. Go to [ettitude.com/model](http://ettitude.com/model), again, that's E-T-T-I-T-U-D-E.com/model. Use a code model15, altogether at checkout for 15% off.

And now, back to the show. It's a very sobering point to think about because of course, we see the surface thing, which is we're eating a high percentage of ultra-processed foods in our diet today. According to the BMJ, right around 60% of the average American's diet is ultra-

processed foods. So, the surface thing is like, Okay, we are creating hormonal dysfunction, we are making our tissues out of really questionable materials. What we're not talking about, and this here is a sobering point, is that we're literally altering our microbiome. We're changing the soil in which our health is kind of springing from. And that in and of itself is so remarkable. But the good news is it's... As far as anything else in our sphere of health, it's the quickest thing we can alter in a positive direction as well. Now, my question would be, if you think about the breakdown products of the processed food, so like the endotoxemia potential here with the interaction, because it's not just what we're feeding our human cells, but what we're feeding our microbes and the byproducts. Could those things also be making us sick?

**DR. EMERAN MAYER:** Yeah, I mean there's certainly this category of... So, in the microbes they have different sources for what they produce. So, a big one is the food obviously, and whatever it is in the food, the chemicals and there's another one that comes from our body, like hormones are secreted into the gut, and then the microbes process them and modify them. And many of them are being reabsorbed, like estrogen or testosterone goes through this circular motion. First it works in the body, then it's excreted in the bile, it goes to the microbes. The microbes change it. A lot of it is excreted in our stool, but a significant portion is reabsorbed and goes back into our system. That's the second source.

And then there's another source which are chemicals that our microbes have never seen in evolution, and huge amount of stuff from plastic particles to what's in the air, what's in the water. And those, I don't think we fully understand what secondary products are generated from the metabolism, what the microbes do.

**SHAWN STEVENSON:** 'Cause don't our bacteria make waste as well right?

**DR. EMERAN MAYER:** Yeah. Yeah. So, I mean, a good example is this whole glyphosate story that we don't have enzymatic machinery to convert this into an absorbable form, but the microbes do. And so, all the studies on the health effects on glyphosate were done on cell cultures, isolated cells. So those negative effects have never really been studied. And I think the industry has done... Monsanto and now Bayer putting a tremendous amount of effort into suppressing and preventing this kind of research that you see. I've not seen any paper quite honestly, and maybe I don't read these kind of specialized toxicity journals or publications, what the metabolic products of glyphosate or other pesticides or insecticides, what they are, and then what they do in our human cells.

And from what I've seen... So, this has been looked at in the context of Parkinson's disease. You know, the Central Valley is sort of an epidemic center for Parkinson's disease because the insecticides and the pesticides being sprayed constantly. The fact that this is still allowed is unbelievable, you know, it's obviously the biggest supplier of vegetables and fruits in the

country. And that's why the reason why this kind of research is being suppressed. But I've seen patients myself who grew up in the Central Valley and developed Parkinson's, and all kinds of strange neurological diseases. And the only tests that these... All these chemicals had to undergo was in the test tube of isolated cells. And it seemed safe in that because these isolated human cells do not have the machinery and the genes to break those down into other toxic compounds. But it's becoming apparent that the microbes do and the... And the microbes will, in that case, generate something that's not good for us.

**SHAWN STEVENSON:** Part of the problem, obviously is the onus is on us, because with the manufacturer, they can create the structure in which they prove safety, but the onus is on us to try to prove that it's not safe or that it's harmful.

**DR. EMERAN MAYER:** Yeah.

**SHAWN STEVENSON:** It's... It's really on the population and so much fallout takes place and we're talking about with Monsanto, we're getting into multibillion dollar entity, and if something is doing well with... The bottom line is so integrated in the culture, they're not going to be willing to...

**DR. EMERAN MAYER:** Exactly. Exactly.

**SHAWN STEVENSON:** Just stop doing the thing their hand, it has to be forced. And so right now, as you mentioned, the data, even something like Chlorpyrifos is another one and, known carcinogen rampant issues with birth defects and miscarriages, the list goes on and on and on, and well noted to be dangerous also agreed upon in the scientific community, but it's caught up in red tape. It was going to be pulled off the market recently, just a couple years ago. But there was like some other litigation came into play and it's just kind of caught up in red tape and it's still out on the market.

**DR. EMERAN MAYER:** Mm-hmm.

**SHAWN STEVENSON:** Doing harm, something that we know is dangerous. And this is the world that we live in, literally, because you mentioned even our air, there are billions of tons of newly concocted chemicals.

**DR. EMERAN MAYER:** Mm-hmm.

**SHAWN STEVENSON:** Tens of thousands of different ones put into our environment every year. And a lot of this we have the EPA, the EPAs putting out these stats, by the way. It's generally where I go and they're sharing these statistics like, are you guys not checking this stuff out?



Like how are there like 40,000 new chemical complexes that are released into the environment in the last decade? Like, how is that even possible?

**DR. EMERAN MAYER:** Yeah. And a good example, an extreme example the EPA obviously has done a great job in many ways, but a good example of how commercial and corporate interests hate that kind of investigation as what you saw under the last administration that basically tried to shut down the EPA. And you would think, why would anybody in the world in this day and age do this? Well, because it's huge commercial interests that are at stake here.

**SHAWN STEVENSON:** Big funding for our government. It's like integrated.

**DR. EMERAN MAYER:** Yeah.

**SHAWN STEVENSON:** As well. Yeah. You got to keep that in mind. You know, something that you mentioned earlier on, it might be one of the most fascinating things. And you talked about how our emotions are expressed in our gut in a sense. And it just got me thinking about the concept of gut feelings, right? So, our gut feeling is a real thing.

**DR. EMERAN MAYER:** Yeah, the term gut feeling, it's used very often. I mean, once you sort of become aware of that term, when I wrote my first book, I saw it five times a day. Different politicians, athletes, everybody talked about their gut, "Based on my gut feelings." And the sort of different way to understand that term, because it's not used just for a single purpose. So gut feelings, butterflies in your stomach on your first date, for example. That's a simple one and that's something that happens acutely. So you are in a situation, it starts in the brain, it goes down, it affects your gut contractions, it probably affects the microbes, it feeds back to the brain through the vagus nerve. And everybody has experienced that. So that's a common one.

Others, a lot of patients that I see, they knew that when they're angry their stomach goes into knots so it's another, it's a negative gut feeling. I mean, the ones with the butterflies can be a good and a positive one. If you have to give a speech somewhere some people get butterflies because of the worry. If you fall in love, it's a positive one. But it's an emotional arousal, it's a very simple one. It gets more complicated when you get into these making decisions based on your gut feelings. That's a tough one because again, a lot of people have done that including myself and being stuck with nearly impossible decision processes. And you made your lists of positive and negative sides, and you just cannot come up with a decision, it seems impossible. And then you do something, you go on a walk, or you go into the beach or said, "Okay, now I'm just going to make this decision." And it, you make it spontaneously, no longer going to these lists and looking at it, but you make it spontaneously and a lot of times it's positive.

Now, there have been reports or... Not reports, but I think it's in books written about this, it can also be dangerous. So, if you're... If your system... If your brain is biased, for example to be extremely anxious, you've always been anxious of things. So, you are going to make that gut-based decision based on your underlying trait anxiety, which is not always the best way to make those. So, the idea that I came up with is when you make a gut-based decision, you can make it instantly, just like a Google search even while you're typing, the answer is already there. And it sort of draws on this enormous body of memories that you have encoded over your lifetime of both positive and negative ones. Not just the emotional aspect also, but also the gut part of it.

Was this associated with a certain gut sensation, and your brain has the ability to access that database, that mass database just like a Google search can. How it does that and you know what systems in the brain can do this, is unknown but it has a lot of similarities, you know, the... So, the speed and not... And non-linear process. The dilemma then is can you recommend everybody to make gut-based decisions? I would say, no. You know, if you...

If you had a lot of trauma when you were young you are not going to make the best decisions for your life now. The same thing if you have genetic predisposition to anxiety. You know risk genes you probably don't make it. So, I've sort of moved to this. This is actually a skill that you should learn. You should be aware of what your biases are to this decision making, and some people do it by paying attention to their dreams. You can... I mean, I've done this for several years in the Yin Yang analysis. Extremely helpful that you learn who... What actually goes on inside of your unconscious and then make your decisions based on how you got to know yourself in terms of these deeper layers. So, I wouldn't recommend it to everybody to make a gut-based decision, but I would recommend to everybody to try to learn how do you do that.

**SHAWN STEVENSON:** Yes.

**DR. EMERAN MAYER:** And some people are obviously masters they make always the right business decision, even though... I mean, you look at the information right now that's available, all these business news and predictions and all the people and business Insider and the stock market and the comments. Essentially, it's impossible to make a linear decision. But then there's individuals who have always made the right investment decisions. That's in some ways a gut-based decisioning and not... And I mean, there was this book by... I forget his name now The Black Swan this former, Wall Street guy who basically came to the conclusion, you cannot make these predictions. The system is so complex that, yeah, you can, after a decision happened, you can interpret it and say, "Oh, yeah, I knew this," but you didn't know it. 'Cause a lot of people pretend they knew it, but... So, every time we deal with these complex systems, I think it always comes out to the same conclusion. You can't use your linear simple brain that served us for hundreds of thousands of years in a simple world. You cannot use that the same

way in the complexity of today, where everything has to be understood in terms of systems and your decisions and actions and behavior based on that.

**SHAWN STEVENSON:** Yeah. So, in essence, we do have these gut feelings and we need to develop accurate assessment of these gut feelings and be aware of our biases and things like that. And so, I want to ask you, have you ever had a gut feeling about something that you shouldn't do, and you did it anyways and then you regretted it.

**DR. EMERAN MAYER:** Yeah, that's, a good point. So, I've also described a few situations in my first book, *The Mind-Gut Connection*, career choices which has always been extremely difficult for me. So, I've... And I didn't know that I was going to go to medical school, didn't know what specialty, didn't know if I should stay in Germany or come to the US. And I've gotten pretty good... When I look back, I always made the right decisions in retrospect, and not by listening to other people, not by these plus, minus list, but really listening to my gut feelings. And I remember a few situations really well. But then there have been other decisions, where, in relationships... Just gone through a recent decision, which I'm still not over with, inherited the house of my parents in a beautiful area of Southern Germany and in the Alps. So, the... The rational decision... I made all these lists, got these big whiteboards all over our house with the pluses and minuses and ask a lot of people. And, then at the end I thought, "Okay, it's obvious the renovation of this house would cost so much money, and I would have to be there. It only makes sense if I move there and live there." And so made the decision, "Okay, let's sell it."

And I'm still not over it. It was such a shock. So, we did sell it, and the first time we went back, I fell in a deep state of depression, for weeks. We came back from this visit and said, "God, it's the first time I made a really big mistake in my life." I didn't go about my gut feelings, which told me to hang onto it. So, I'm still hoping that the turn of... The turn of events will show me at some point actually it was good. It was just... Interim's impression was, it was not the best idea, but this was a decision not based on gut feelings for me.

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** And very painful. And it's, two years later and it's still not over that.

**SHAWN STEVENSON:** Yeah. That's... You... We were just talking about this before the show, there's a new film out, it's called *Medicating Normal*. And those feelings that you're experiencing are normal feelings, and there is a variety of ways, of course, to process those things. And some things we really just don't ever get over. And it's being able to integrate with those things and, finding a way to move forward. Because here's the thing too, even in these moments when, we have that gut feeling and we make the other decision, it tends to teach us something, if we're open to it. But we can try and suppress that or lie to ourselves. And I'm

grateful, thank you for sharing that, because it just... Expressing that honesty about that decision. And I always loved the concept of intuition aligning with science in a way that it's advanced pattern recognition, and that, our brain, our gut is sensing and giving us feedback, and it's integrating into this feeling that we have, and it's based on our experience, our perceptions, our accumulated knowledge.

And hopefully we have accumulated some knowledge to be able to have that. But then there's the element that we can't really explain. And that's what's so fascinating too, because we had on recently, largely considered one of the... If not the top kind of self-defense expert, but he doesn't really teach self-defense. He's really steering, if you actually look into his education, steering people away from the place where they have to ever use self-defense, right? By using advanced pattern recognition. And he's had the ability to, survey and of course, he works with... The big military companies bring him in and these big events and all this stuff. And he's often brought in to teach fear management. Right? And him having this huge database of people who've experienced violent... Crimes of violent offenses.

He said every one of them, would just say... Maybe 2,000 people, every person without fail has said that they had a bad feeling before, whatever took place. It's just like, how do we know, like whether it's something good or something not good. There's this kind of hidden element still in science. And even it's the big question too, with consciousness. There's so much, and you... I don't know if we, talked about this before this show, but I know we mentioned this. There's so much that we don't know, and you're one of those people who've been on the cutting edge because of your choice earlier on to study the microbiome. To study the gut, decades before it became in vogue. And now you're sitting in this place of prominence and experience and insight that you're just able to literally funnel this into other people. But we were talking about, again, just how much we still have to discover. And I think it's a dangerous place when we get with science into a place where we think we've got it figured out.

**DR. EMERAN MAYER:** Yeah, I mean, just, briefly coming back... That personal example that I told you. So there clearly was a vast database of experience. I've grown up in this house, I've lived there. Even when I was going to university, for 27 years, I was totally immersed emotionally with my parents and my brother and sister, beautiful environment. All these emotional experiences we've talked about this earlier, didn't just happen in my brain. I mean, they were always associated with the gut and/or either the microbes, without my knowledge. I had no idea at the time.

**SHAWN STEVENSON:** You actually talk about this in your book, about that early life experiences creating that kind of gut/brain dialogue.

**DR. EMERAN MAYER:** Yeah. Yeah. And so, that I made a brain only based decision overriding all this vast body of information. It was... When you think about it's kind of crazy really. And some people can do this, if you're only interested in finances or making money, then you can override it. So, there's definitely individuals who don't listen to that part of their... They just operate like a computer. Our brain is a good prediction machine for... But the reason that it's affecting me so much is because that vast database is still active. And emotional effect this has on my mood and had on my level of depression at the time when I came back indicates how powerful that is. That all came... All this information came back up and now I have to process it after the fact, and... Yeah. And so, in terms of science, I think, good examples, what's happening right now in brain science and neuroscience is this whole unexpected resurgence of psychedelics, something that we have suppressed for 50 years. Politicians have suppressed, even though scientists knew better, 50 years ago, and now it's coming back, and we don't really know where it's going to lead us. It certainly opens up parts of the brain that have not been part of our psychiatry or neurology or our disease models.

And I think it will happen fairly fast because science is beginning to embrace it, funding agencies, even the NIH, a lot of investors pouring money into this. So, this will fundamentally change how I think we look at our brains and how we think about the world, and so... And with the microbiome I think there's still lots of things that we have to learn. I would say we're probably around 10% of our knowledge to understand the whole system, a lot of details, technical details, molecular details, but we don't even know how to go from findings in a mouse, and the mouse results are all very impressive and revolutionary. We don't even know how to go from there to see, does this happen in humans? We don't know that you know. So, I think we're at very early stage of it, and I think there's certain things that have helped, even at this early stage, that we have a very good rationale now of why a healthy diet is important, and what kind of diet, it's almost like, answer that question. I would say a diet that's good for your microbes is good for your body as well.

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** There's no question about that. So that eliminates like a lot of these fat diets.

**SHAWN STEVENSON:** That was actually going to be my next question, which is, what are some of the things that we can do proactively? Because you talked about, for example, in your book about early life exposures, really helping to kind of set the blueprint for our gut, but this is also extended out throughout our lifetime. What are some of the things for us to proactively expose ourselves to? What are some good exposures for developing healthier microbiome, a healthier gut, and even our gut feelings? What are some of the things that we should get ourselves around and expose ourselves to?

**DR. EMERAN MAYER:** Okay. If you stick with the diet part first, that's... It's not the only one, but it's an important one. I mean, that really starts, even prenatally, the nutrition of the pregnant mother is a very important point because the health of the mother's microbiome has an influence on the state of this low-grade inflammation, which is an influence on the developing fetus and the developing baby. So, the brain of the newborn infant is already influenced by what the mother... What diet the mother was on, and what lifestyle... What good things the mother did for the gut health and microbial health.

Then the first three years of life where there's shaping of the baby's microbiome, and the interaction with the immune system, this teaching of the immune system, what's good and bad, which bacteria are good, which are bad. If we don't want to interfere with that process, or interfere as little as possible with it, so prenatally, postnatally. But then it goes on in the adult, so now we're stuck with a system that's impartially programmed from the mother's side, and the mother's gut health by the infant's gut health, but it's not completely stuck in that mode. So early on people said, "So what can I do if I was exposed to antibiotics in an unhealthy diet and was not breast fed? Am I doomed?" Is my health and my gut health doomed for the rest of my life? So initially people thought that this is a pretty bad outlook, but it's not... That's not the case. As I mentioned earlier, we can change the gut microbiome in 48 hours by switching the diet within a certain bandwidth. We can't bring it back to something that hunter-gatherers in Africa or...

**SHAWN STEVENSON:** Bringing back certain species.

**DR. EMERAN MAYER:** Yeah, we can't bring it back. There may be species that are extremely low, almost non-detectable levels that could be nurtured back, you know? And so, what we can do to help this process is to go to a diet, and I always said, you know, it's tailored to the microbes. Things that are not absorbed rapidly in our small intestine. Most of our nutrition, and modern nutrition is all focused on let's get the carbs in, and let's get the protein in, and let's get the healthy fats in. It's all absorbed in the small intestine. Nobody thought or talked about, "Well, why not think about... Let's talk about all the food that goes down to the microbes," and the microbes produce these metabolites that... Like the short chain fatty acids that are healthy for us. So, I think as an adult main guideline I would say, in terms of diet is focus on the foods that we know today based on the science we know today are optimal for a healthy ecosystem of our microbes.

So, these are all the big molecules, the fiber molecules, the polyphenol molecules, both of which of these categories come from plant-based food, but also add the omega-3 into it. And you know, a few other things. But the main components of this largely plant-based diet are the components that our microbes are specialized in and can produce 100s, 1000s of metabolites.

Many of them, we don't know what they do, but the ones that we have a lot of information, short chain fatty acids, sort of like the aspirin of the body or of the microbial world, that we have a system inside of us that produces anti-inflammatory substances that act in the gut, in the body, in the liver, in the heart, and in the brain.

If we nurture that, so we have the optimal level of this, and we decrease the components that have an pro-inflammatory effect like things in certain food items, then it's fairly easy. We almost know the answer today based on the diet, but the diet is not the only part. So, the microbial ecosystem is also exposed, as we talked about earlier to these influences from the brain, your emotions, your positive emotions, your negative emotions. This system only functions optimally if it's not constantly disturbed, perturbed by negative emotions and stress and anxiety and ex... Fear interestingly have the same negative effect on the health of the gut microbiome as an unhealthy diet has. So now you combine those two, which is not atypical in our society.

**SHAWN STEVENSON:** Right, right.

**DR. EMERAN MAYER:** And we've talked about this in the past as well, that certain social economic segments of our society are particularly affected by this combination.

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** With the stress, the negative emotions, and unhealthy diet. You had the perfect storm for a... An unhealthy environment. So big recommendation deal with the diet, which is not easy, the cost of it, the availability. And then, you know, with teaching mindfulness, making people aware, online programs for mindfulness and then emotional hygiene. I would say so... I mean, those are the main things that people can do. Now, there's one thing, I've never been a big proponent of supplements, particularly of individual supplements, which, you know, I just think it's a nice placebo, but what big studies have shown, if people are on a healthy diet that is rich in these polyphenols, so, you know, plant-based diet, then the benefit from an additional supplement which is shown in the study of 20,000 people is not that great.

But if you don't have that healthy diet, then you have a significant benefit on cardiovascular health and mortality. And so, one idea is that maybe it's easier to provide people that are... Can... Don't have access to these diets and have the stressful life that they're dealing with. That's the indication, that's the population. You might want to promote selective evidence-based supplements because they don't have it themselves. And it could make a huge influence, you know, on longevity and mortality. And so, I would say those two things. I mean, the influences from the brain and the influences through our diet are the two things. Ideally, you want to combine those, if you want to have a healthy lifestyle for your gut ecosystem. I think

you need to do both of these things. And, if you are at a very high risk, possibly also genetically, you may want to look at these other modalities, you know, that are becoming available, what the supplements... But also, some online programs has more and more of these cognitive behavioral, the mindfulness, you know, happiness like that DL course that the most successful course ever created about you know, teaching happiness.

That's a good example. So, you can actually teach people from students to the regular population to create a positive mind state, which will then have this positive effect on the... On your gut health as well. I bet you if they've done a study on... Not just the happiness level of people that have completed this course, but also on their gut symptoms, I'm not sure if that was done. But I doubt it was done. They would have seen a significant effect on that. Yeah.

**SHAWN STEVENSON:** Yeah. You already know. You already know.

**DR. EMERAN MAYER:** Yeah. I sort of know the answer.

**SHAWN STEVENSON:** These things literally feed into each other as well, you know, so having healthier emotions. If we get good social networks, social connections, and we see the integration with food in those circumstances, we tend to make better food choices when we're eating together with family members, for example. And there's studies out of Harvard, there's studies done on, you know, children and adolescents. The benefits are there in the data as well. But what happens when we have those healthy social connections and good food? Like, we're starting to stack conditions as you talked about earlier, with the network that...

**DR. EMERAN MAYER:** Yeah.

**SHAWN STEVENSON:** Overall systems network. So now this also, the final thing I want to ask you about is kind of getting back into our... A piece of our conversation, which is there's still so much for us to know, and how certain prevailing paradigms or just kind of standard of care can take hold even when the data changes. And there's a recent study published in the New England Journal of Medicine on colonoscopies. Let's talk about that.

**DR. EMERAN MAYER:** Yeah. I mean, there were two studies, you sent me one about the antidepressants, you know, the serotonin reuptake inhibitors. And I told you about this colonoscopy study. So, two examples almost at the same time they've come out that shows you that limitation of just relying on... Totally relying on and thinking that there's no... It's the gold standard now. So, with the standard study on, I think on 80,000, in Scandinavia on 80,000 people in Northern Europe with screening colonoscopies, and there's a lot of reasons you could criticize that study because only a fraction of the people that were contacted showed up for the colonoscopy. But if you base the results on the intention to treat, they found... Yes, there



is a small benefit of the colonoscopy screening, certainly not as big as has been promoted in the US and my colleagues at UCLA have built a career on this promotion. And so that has shown that the effect size is actually quite small. That people that didn't develop colon cancer or that had surgery or that died from colon cancer was not that greatly affected.

**SHAWN STEVENSON:** Although this is a very cost intensive procedure.

**DR. EMERAN MAYER:** Very cost-effective procedure. And it's popularity. I hate to say this as a gastroenterologist, hoping none of my colleagues at UCLA listens. Its popularity was clearly driven by professional societies 'cause it's a huge income bonus for gastroenterologists. You know, I mean that feeds whole careers and practices and screening colonoscopies and then lowering the age now recently to 45, you know?

**SHAWN STEVENSON:** Right. Yeah.

**DR. EMERAN MAYER:** And I bet you, it will be lowered even further because...

**SHAWN STEVENSON:** Absolutely. Yeah.

**DR. EMERAN MAYER:** There's... So, in Europe the main screening technique or these DNA tests, these tool tests, which have been improved tremendously. And I think there's going to be... Obviously, there's got to be some middle ground, some compromise. If you have high risk factors, family risk of colon cancer if your stool test is positive, you should have a colonoscopy. But the screening colonoscopy for everybody, regardless of risk factors, I personally never really believed in that concept. Particularly when you hear that almost none of these patients or the programs, they go to makes any dietary assessment or recommendation, which is one of the main causes for colon cancer.

**SHAWN STEVENSON:** Right. Yeah, exactly.

**DR. EMERAN MAYER:** And the decreasing age of prevalence to 45 now is because of the diet. It's not some miraculous thing that's happening. So that's something I think you have to be careful with these... This is a good example. The combination of massive commercial interests with scientific concepts but leaving out a big portion like the diet side. Another example is with antidepressants, this big study, this meta-analysis of showing that the effectiveness of serotonin system targeted drugs for depression has been exaggerated. I still think there's a lot to be learned of serotonin and serotonin receptor modulation. 90% is in the gut, it's not even in the brain world is these psychiatric medications are targeted at. But I think this... And antidepressants have saved many, many lives, serotonin reuptake inhibitors...

**SHAWN STEVENSON:** But they've also destroyed some lives too.

**DR. EMERAN MAYER:** Yeah. It has destroyed some lives. And hopefully we're not getting into the same mistake with now with the psychedelic enhanced psychotherapy for depression. 'Cause that could lead to a similar kind of situation that 10 years later we realize, wow, this is... Was totally exaggerated. And... 'Cause a lot of people develop depression because it's an appropriate reaction of the brain to situations that they're in. And it's obviously easier to give a pill than to offer somebody like cognitive behavioral therapy and...

**SHAWN STEVENSON:** To help them process.

**DR. EMERAN MAYER:** Yeah, yeah.

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** But it's interesting. Like it's almost... It's a kind of coincidence that two papers have kind of addressed two very common prevalent practices in medicine that were supposedly based on a lot of science. I mean, a lot of papers have come out of this, you know?

**SHAWN STEVENSON:** Yeah. And you mentioned also when you sent it over to me that... Again, less costly things like stool samples that are even becoming more efficient as well can be just as informative as this very costly kind of, again, standard of care procedure with colonoscopy. And then there are cases where that methodology is absolutely appropriate.

**DR. EMERAN MAYER:** Absolutely.

**SHAWN STEVENSON:** But, the current structure of things, again, it's just... It's kind of even with statins. Like it keeps lowering down the cholesterol level to where you should be on a statin and now, we're moving back the timeline when you need to go in for colonoscopy. And again, I can foresee it being 40 very soon here. Just keeping moving the goal post without... So, we're using this methodology to find a problem and then not actually removing the cause if there is a problem.

**DR. EMERAN MAYER:** Yeah.

**SHAWN STEVENSON:** That is the problem.

**DR. EMERAN MAYER:** That's... That's a problem.

**SHAWN STEVENSON:** And so again, I just appreciate your insight, your experience. You create these wonderful resources for us as well with your two best-selling books, Mind-Gut Connection, and also the more recent one, looking at the immune system. Oh, my goodness. Can you let people know where they can pick up your books and also just getting more information.

**DR. EMERAN MAYER:** Yeah, so it's the Mind-Gut connection, which is still after six, almost seven years, hovers around the Amazon bestseller list, which really amazes me how that's possible. And the Gut-Immune... That's the second one, the Gut-Immune Connection, which is in some ways a sequel and an update. It still has a lot about the mind and the brain, but then it identifies the immune system as this main transduction mechanism of these influences that are negative influence created by our diet and by these brain influences, how that then causes disease. And that's where the immune system comes in. And people are now more fascinated, which I find interesting with the mind and the brain than with the immune system at the moment. It sort of comes... It comes in waves.

I mean, when Mind-Gut connection first came out, it wasn't that popular the first year. And sort of create a whole wave of interest and enthusiasm and spread to all kinds of levels of media and online programs. So, people can go on Amazon. Mind-Gut connection is out on Paperback. The Gut-Immune Connection we're working on the paperback edition which will be updated and so it's going to be more appropriate for readers today.

**SHAWN STEVENSON:** Awesome. We'll stay tuned for that. Of course, we'll put in the show notes link to all the books and also your website as well. And, again, I truly appreciate your insight, especially at a time like this. You tend to be ahead of the curve because... And for good reason, you've been in this field for, what? 40... You're getting close to 40 years.

**DR. EMERAN MAYER:** 40 years. Yeah.

**SHAWN STEVENSON:** This is really remarkable and we're talking about what's coming up with the microbiome and even this insight that you shared with the colonoscopies. This was something that was still prior to the data coming out, you were just like, something is not matching up here. And so, I just really appreciate that, I appreciate your voice and I can't wait to have you back on again to talk about more. It's always fascinating.

**DR. EMERAN MAYER:** Yeah. I know, this is fascinating. And thanks for the comment about this being ahead of the curve. It's a curse and a benefit. The curse is you come out with these things, and nobody believes it. And nobody's interested in it.

**SHAWN STEVENSON:** Yeah.

**DR. EMERAN MAYER:** And so, you have to wait 10 years before... Give you another example. Like 20 years ago we started a wellness, a holistic, comprehensive, multidisciplinary wellness program at UCLA in the division of digestive diseases. And we had acupuncturists and psychologists and dieticians, and it was very successful, very popular for the patients. But the institution pulled the plug on it. You know, kind of said that this is not gastroenterology. And 25, 30 years later, our division chief, who's younger person created a very similar program almost using the blueprint. But if you imagine, how you feel, so you did this 30 years ago, the leadership of your institution pulled the plug and dismissed it as useless, and then you see it 30 years later coming back in full speed. So, what it is inside of me that does that, I've often wondered about this. Why does my... As a concluding comment. So why does my brain do that? Make these assessments, predictions come up with models that are not matching with the current state of knowledge or current state of acceptance. Maybe it does have to do with the mind-gut connection that there's something in my gut that interacts with the brain and computes information in a way that other people are not doing it the same way. Which goes again with this intuition and knowing things at a gut level rather than just pure, at a cognitive level. So, maybe.

**SHAWN STEVENSON:** Yeah. It's so poetic that this is the case, and there's always people who go ahead and pave the way for us. So, just know that you're appreciated.

**DR. EMERAN MAYER:** Thanks, Shawn. It's a pleasure talking to you as always.

**SHAWN STEVENSON:** Of course. It's totally my honor. Dr. Emeran Mayer, everybody. Thank you so much for tuning in to the show today. This is definitely one to share up with your friends and family. You've got to really get this education into more people's hearts and hands. As more and more data's coming out about our standard of care and our healthcare model, for example, with Dr. Mayer mentioning the need for colonoscopies and the potential harms that are being done with that kind of thing. And this procedure that's being done in the framing of a routine checkup, but really looking at the necessity for it and the outcomes for it is very different from what is kind of integrated itself into our culture.

And so the potential downsides, being able to analyze that, put it in a proper perspective, but also understanding that we have wonderful advancements in minimally invasive technologies, but also non-invasive things like stool samples to be able to give not just data that's as good, but potentially better data that can then set the tone for in the instances that it's actually necessary having the colonoscopy skill on the table versus it being something that is simply normalized just to do based on age and not based on necessity.

And also looking at this practice being something that is very cost intensive in providing a lot of monetary gain for the system, including the folks that are working in it. But this is not to say that our physicians are not doing something that they believe to be based on their education, what's right for the patient, but what's actually best for the patient. Oftentimes, especially again, you look at the outcomes in our culture, are we reducing rates of cancer? Are we reducing rates of heart disease, of diabetes, of autoimmune conditions, of even colon cancer, for example? All these things continue to climb. We're not addressing the underlying cause and putting patients in positions of power and working together with their physicians and having this integrated partnership, much like the gut-brain connection to really assess and put together a plan that is right for that person right now.

We have standard of care where it's really a one-size-fits-all model and that is so wildly inappropriate, especially for this time in human history when we understand... We still don't understand the depth of it, but we understand how diverse we really are. And something that might be absolutely amazing for one person can be an absolute poison for another person. And so, we're moving towards personalized nutrition, personalized medicine, personalized treatments. But for that to happen, we're going to have to pull back from the standard of care in treating everybody in this cookie cutter fashion, in questioning the procedures and the day-to-day processes that are taking place in healthcare where the health has been pulled out.

And now we have a sick care system where our physicians are oftentimes routinely five-to-seven-minute office visits and dishing out medications based on conversations and not actually being able to spend time with patients to find out what's going on in their life. To find out what's going on with their stress, to find out what's going on with their lifestyle that is then manifesting the disease that we're utilizing drugs and surgery to treat instead of removing the cause of the disease. But things are changing. Again, you are part of that change and I appreciate you so very much.

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