Episode 73: The Truth About EMF’s, Wi-fi, and Radiation (& How to Avoid Them!) with Dan DeBaun
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And now onto the episode.

Katie: Welcome to the healthy moms podcast. I'm Katie from wellnessmama.com. And in today's world, EMFs are a controversial topic, and I'm excited to talk to the man who literally wrote the book on this topic, and he was pioneering devices to reduce EMF exposure through his company, DefenderShield. Daniel DeBaun is an internationally recognized expert in EMF protection, and author of the new book, "Radiation Nation." He has over 30 years of engineering experience in the telecommunications industry, and his concerns over EMF exposure grew from his in-depth knowledge of what it is and how it works. And he's here today to demystify EMFs and explain how we can all keep our families safe, and I can't wait to jump in. Welcome Daniel.

Daniel: Well, thank you so much, Katie. I appreciate you inviting me here.

Katie: Oh, I think it's going be so much fun. I was just saying before we jumped on, I have a list of topics that I want to understand more, and so I hope this will just be a really informative conversation for everyone listening, and for me too.

Daniel: Well, I'll try to answer any questions you have.

Katie: Awesome. Well, let's start at the beginning. So, I think most people have an understanding of it, but can you define what EMFs are so that everybody knows what we're talking about?

Daniel: Yeah. In nature, there's no such thing as electromagnetic radiation. Electromagnetic radiation, the only source of it in nature is the ground itself, generates an extremely, extremely low energy source, but everything that's around us these days are emissions that we are generating. Say you want to talk to your friend using a cell phone, say you want to look for data using your laptop through a Wi-Fi router, all the communications that are occurring are all man-made. So we're not really been exposed to this stuff for very, very long. But recently, it's all around us, everywhere we go. What that's actually doing is, if you take your little finger and you look at the tip of the finger, pretend there's a tiny little emanation coming
out, a ball that's opening more, and more, and more, and more, and more, that ball is now flowing out towards a distant location. Like if you are using a cell phone, that's going up several miles to a cell tower.

So, that's an emission that's being generated by a human, communicating between devices, to improve our lives. So that's essentially what it is. And you also may want to think about this way as well, when you're looking at the ocean, and waves are coming in, and you have a little buoy that's right outside the breaking waves, and you have a boat and you're looking at that, there are waves that are going by that buoy that you're watching. When we talk about electromagnetic radiation, we talk about the frequency of radiation. That frequency is, how many waves pass that buoy at any given time. So when you have really few of them, a half a dozen per second, versus X-ray, which is terabytes, which is thousands on millions of waves a second. And that's what it is. We're generating these waves to communicate in our daily lives. Hopefully that helps, Katie.

Katie: Yeah, that does help. So, to make sure I understand, there's obviously a lot of different types of radiation that kind of fall under this definition of EMF, right? So, would an X-ray be considered that, or also, like you mentioned, cell phone radiation and Wi-Fi. Are those all...what about microwave radiation? Are there other types of radiation that people would be familiar with?

Daniel: That's a wonderful question, Katie. When we talk about radiation, we talk about a spectrum. It starts at really, really low frequency, and goes really, really high. X-rays are on the high side. There's a lot of waves per second that go by us, and they're different than microwaves. Microwaves are much lower than X-rays by orders of magnitude, actually. And a microwave is a radio frequency wave. Everything we use: our laptops, our cell phones, our tablets, they all connect to using a Wi-Fi signal which is 1 GHz roughly to 10GHz. So, it's in that range. And then, you have all the wires that run around your house and the wires that run along the road, those also emit electromagnetic radiation, but those are much lower emissions. So, there are many, many sources, and there are more and more in our daily lives that we need to be concerned about.

Katie: That makes total sense, and that's an interesting thing to think about, I know a lot of people who don't use microwaves because they're aware of the radiation issue, but still sit with a laptop on their lap all day long, so let's delve a little deeper. You have 30 years of experience in the telecommunications industry, tell your story. How did you kind of start to wake up to like, the idea of EMFs, and that we should maybe start protecting ourselves?

Daniel: Good question. I smile when I'm asked this question because I used to run technical laboratories. Well, some of the most sophisticated in the world actually. And I used to be concerned about all the kinds of parameters related to electronic equipment. I very rarely worried about the electromagnetic radiation component of those electronics. But then, I retired out of the telecom industry. And one day, I had my sons visiting us, and they had their laptops on their laps for several hours, and my wife turns around and says, "Wait a minute, that can't be good for me, and I want grandchildren. Good for you, I want grandchildren." Instantly, I realized I know the spectrum she's talking about, and there is probably danger when that emission is so close.

So, I said, "Well, let's go buy something." And we went out to look for emissions shielding to protect our kids, and we couldn't find it. That was effective across the spectrum that it had to be. So, that's what got us interested in trying to help the industry with products, and also, help our industry be informed about what the subject matter is all about. That's how we started, it was just self-preservation. I ended up
building products for my sons, and then their friends wanted products, and then their friends of their friends wanted products. And that's how we actually got started.

Katie: Wow, that's neat. And I know you guys do have a laptop shield that you sell now, and I use it every day since I pretty much have to work on a computer for my job. But I'd love to know, so, what are some of the risks that we're looking at with EMFs?

Daniel: Katie, you know, you talk about the laptop, to give you some specifics, after several hours, like 25% of the male sperm is immobile, and then something like 2% of all females receive tumors over extended exposures of the reproduction system of a female, of which, a small portion of them become cancerous. So, it is very serious when you bring these devices close to your body. And having that protection like you suggested is actually smart. And by the way, you don't have to have a product, by matter of fact, by anybody for protection. You stay a little bit away from it, and you're safe, believe it or not. And we may be able to talk about that a little more in detail, but what is it that's dangerous?

You know, you mentioned microwaves, and we spoke about Wi-Fi. Well, let's talk about a microwave signal. A microwave signal that cooks meat in the oven uses a 2 GHz signal. It's just the speed of the waves going into the meat, it hits the water, it heats up the water, the cells oscillate, and those oscillations heat up, and that's what cooks your meat. Well, guess what? A Wi-Fi signal and a cell phone signal are RF signals or microwave. They are the identical. Microwave's RF signals are thermal emitting signal. They are known to heat up the body when it touches the body, and that's what you're trying to be careful about is, you don't want it to be cooked like the meat in your oven gets cooked. And so, that's something to think about when you're looking at getting close to these kinds of emissions.

Katie: That makes a lot of sense. So, obviously, fertility could be a big risk if it reduces sperm motility and also creates tumors in women, both of those would have a really direct impact on fertility. But the thing that always worries me, and the reason I got into researching this is not just because of keeping myself safe, but realizing that kids today are on all kinds of technology all day long. And when you're talking about little kids, and exposing their reproductive organs to these kind of radiation, what are we looking at as far as, do we have any data yet, as far as what this is going to do to our kids in the long term?

Daniel: We do actually. We know that our bodies can be influenced from a RF signal. What we know is that, the cell, after lengths of exposure can be damaged, DNA damaged or the cell may be mutated. And so, talking about the womb of a woman, there are some scientists that are quite concerned that there is DNA damage that occurs to the egg of a female. And that egg then gets fertilized over time, and then that mutated cell ends up becoming part of the DNA of their offspring. So it's subtending generation is getting worse and worse and worse with damaged DNA.

So there's those kind of implications that scientists are arguing is a problem. I don't know if that has been exhaustively studied as it should be, but there is certainly clear evidence that, that damage occurs. And by the way, if you're a pregnant female, and you have a laptop next to your lap, the emissions, you know, like the...we talked about wiring in your house? That's known as extremely low frequency emissions. Those laptop devices actually generate those emissions. So when you have it close to the belly of a pregnant woman under very low emissions, exposures, you're potentially likely to have a miscarriage by two times to three times, believe it or not, when you're so close to the womb. So it's serious stuff.
Daniel: You know, it's interesting, the study work, the science, the medical study work, attempts to differentiate, but what we know is, extremely low energy levels and a little bit higher energy levels, there is appreciably no difference to the impact to the cell. What do I mean by that? With a cell phone, you can actually go three to five miles, you want to think of the energy of that cell phone, powerful enough to go to a tower. A Wi-Fi can go 500 feet, let's say, and so, that's less energy than a cell phone. So, you could intuitively suggest that that's less dangerous. A Bluetooth can go 30 feet, so it's much less, to orders of magnitude, less power. And so, you would think that's, orders of magnitude less danger. It's not necessarily so. All of those are considered a relatively low level of emission exposure. In other words, even the lowest Bluetooth emission, has the potential of impacting the cell, as does a cell phone emission. It depends on what part of the body it's touching.

Katie: Okay. So, I've seen things floating around on social media as far as like, I think like thermal scans of the brain, before and after cell phone use. So, we've talked about the fertility aspect in the reproductive organs, what kind of an impact does this have on our brains, when we're holding a cell phone right next to our head for an extended period of time?

Daniel: I love that question, Katie. One of the things that we talk about often is the potential dangers. There's such a preponderance of evidence that a cell phone touching a head causes danger, damage to the cells. And so, when we talk about it, you put a cell phone to your head and it gets warm. You put a cell phone on the head and you get a headache. What are these... What's going on? What we know, for sure, is the emissions going through the head, and it's penetrating to the point where it's bothering the cells, it's irritatting the cells. To what extent can it irritate that cell? Well, this last summer, around the May of this year, the National Toxicity Program Study was released by the federal government, a branch of the federal government, and they spent $25 million creating an isolation chamber in which they generated a cell phone emission and it directly impacted a study population in an epidemiology study.

What they found was, there is no doubt, there was a direct link after exposure to frontal lobe cancer and heart cancer. In other words, what they found was, any time you are close to a soft tissue, there is a greater likelihood of a problem, an impact if you have these emissions close to your body. So, where there was before some question, in the past, and a debate in the community about these emissions and the impact to the body, cell phone use, extended use, can impact the frontal lobe of the brain, and it can cause serious concerns for the body. And by the way, that emission, if you track the last 10 years of frontal lobe cancers, it's growing 2% per year, every year.

What's interesting about that, Katie, is that, if we go back to when the standard was created, somewhat 30 years ago, I like to think of it as, it was done on a six-foot male. It was on an area of the brain, of the surface of the head, wouldn't heat up more than two degrees, a thermal emission. And it was an occasional use, that's what established the energy level of that signal. If I think about 30 years ago, I didn't have too many friends to call, I'm six-foot male and I didn't get that much exposure because I didn't have many friends to call. Now, fast forward to today, and you have kids using it. What happens to that signal that penetrated one inch into the six-foot male, by the standard and heated up two degrees?
What happens to that signal to a child that has a third of his thickness of a skull? Well, it can penetrate that skull completely through the head. So, what's the impact of that to a child? It's pretty serious. So, you really should be careful when you have children on cell phones. They should be very shortly used, and avoid it if they can.

Katie: Yeah. I definitely I’m careful with that with our kids, and I’ll be that old-fashioned mom who won’t let them have phones till they’re actually driving, and then only in case of emergencies for that reason.

Daniel: Yeah. It's serious stuff. It impacts a child. You remember when you were growing up, there weren't many cell phones, there weren't many Wi-Fis in your environment. Now, you look around and it's all over the place. And so, you really do have to, they call that precautionary measures. You want to just be careful about the environment you're around to make sure that when you are exposed, those exposures are minimized by taking actions that you can take.

Katie: Absolutely. I feel like that's a lot of what I talk about on my blog is, especially some areas we don't truly know, we don't have the research yet to know for sure if something's harmful or not. But my thing is always if there's an easy substitution that we know is not harmful, why not, especially for the sake of your kids, make that substitution. And that's a lot of what I do in our life, is make those simple switches. But I'm curious, so it seems like some people are actually like noticeably physically affected by EMFs more than others. So I have a friend who, if he's around Wi-Fi, he experiences like physiological symptoms, and like it makes him fatigued and he can get headaches, and he can almost hear like a buzzing. For me, I don't notice that in our home, but I notice from being on airplanes, where a lot of planes now have Wi-Fi. And if I have to fly more than about an hour, like I get off the plane and I have to sleep for a few hours because like it completely drains me. What's the reason maybe some people seem to have a much more noticeable reaction?

Daniel: That’s a modern day consequence of EMF exposure. It's called electromagnetic hypersensitivity. 15 to 20% of the entire population now feels emissions when they’re close to them. When they’re really close, it can really bother them. Most of us won’t feel it, we can’t smell it, we can't see it, and we don’t feel it. But that 15% to 20% of our population actually does feel it. And so, of that population, by the way, 80% are women. So it seems like the female is more sort of susceptible, their cells are more susceptible to the emissions and impacts to the cell. What's actually going on there is, think of the cell as, it has a little membrane around it, and there's a toxin trying to attack the inside of the cell, that is electromagnetic radiation. It could be an insecticide, it can be arsenic, it can be any toxin trying to attack the cell membrane.

When that occurs, the function of the cell actually changes, it goes from a happy face to a sad face and it says, “You know what? I'm not going to share my proteins with my neighbor. I really feel like I don't want to respond, I'm in survival mode, I gotta make sure that I survive.” So, the cell itself, when it's going into that mode, it's all the cells around it. That actually is what causes you getting headaches. And when you get close to it, that's why you get bothered. It's actually creating a dysfunction within the body system like any toxin will do to the cell. And you were talking about before, about, you know, you going to watch your health. And people are aware of the fact that, you know, Non-GMO is good, potentially. Or good quality natural foods are good for you.

Well here's an example of, here's something you gotta be aware of, and you really should think about it in the context of it attacking your body under the right circumstances. And if you can, you gotta try to avoid all this stuff.
Katie: Yeah. I agree with you completely on that. And I'm curious if you have any data or research, like especially me, I notice it's so much more on planes. And my theory from my completely untrained mind, I have no background in electrical engineering like you do, but is that you're in a very closed and metal environment that has a Wi-Fi router, so that signal is kind of like essentially concentrated and trapped in a plane. Is there any truth to that or any idea why I might feel it more so on a plane than even at home?

Daniel: Yeah. Let me bring it more down to home. When you're in your car and you have a cell phone on, your cell phone can actually work at three different levels. It modulates from low, medium, to high. When you're in a car, it has a problem getting to the cell tower. So what it does is, it says, "I need more energy." So it builds up the level of the energy to try to touch that tower. When it's maximum and you are sensitive, that's when you feel it most. And so, any closed environment, as you're pointing out, there is a higher energy because the signal levels in your environment are actually producing stronger level energy. And that's what you're feeling.

Katie: That makes perfect sense. And I'm also curious what your take is, there's been a lot in the news recently about the new 5G Wi-Fi routers that are going to be coming pretty much everywhere near you, like coming to a telephone pole near you, or they're planning to implement these all over. And I've just seen some interesting research on, you mentioned the levels of frequency and how much stronger the 5G is. Even there are people who speculate that the airlines that have already been adopting the higher speed Wi-Fi are seeing more health problems in their flight attendants and pilots who are on planes all day long. And, of course, we don't have any definitive data on this yet, but my skeptic brain says, maybe there's a connection we're not looking at with these EMFs. Is 5G worse, because I know we're all about to encounter this on a much more widespread scale?

Daniel: Wonderful question. When you have a Wi-Fi router, it works at 2.4 GHz. That's a bunch of waves over a time interval that gets to your laptop. It also works in 5.8, that means it's twice as fast. What does twice as fast mean? That means there's twice as much bandwidth to get information, data to you. So when you look at 5G, you're looking at going from a 2 GHz signal to a 20 GHz signal, 10 times the bandwidth, to 90 GHz, depending on what they do. So, you have a significant bandwidth now, more data, that's passing. What's also true is that they use, to transport the data, there's an algorithm used to transport between one device to the other, and think of that, the transport media like a hose, you have one hose going to fill a pool, and you want to do it much faster. So how do you make it faster? You take another hose and you go to the pool, that's doubling the volume of water.

Well, they're doing the same thing when they go to 5G, It's called MIMO, More In, More Out. So, it's not just the frequency increasing, but the data, which is...it's a pulsing data, is also now doubling because of the MIMO technology. What does all that mean? What we know is, that in the 3G and 4G, there's an increase of danger to the cell because it's a pulsing signal, not a constant load to the cell. Now, we're going to take it to the next significant level, and it's gonna pulse much, much faster and much, much more pounding occurs to the cell. The membrane fails more quickly under those circumstances. Of course, we don't have study work about it, but we clearly understand the problem, and there's no question whatsoever that 5G is much, much worse than 4G, which was infinitely more dangerous than G2, which was an analog signal.

Katie: Yeah. I think you're right. I hope that we're going to have actual studies on this soon, even although... I want to talk about how we're going to protect ourselves. But I think this topic has a lot of skeptics, and almost to me, to them it's like they're saying, "If we can't see it, it can't be bad." Like EMFs are these kind of invisible things and they really can't affect us. And personally, it reminds me of, you
know, a couple of generations ago when they said, “Oh, smoking can't be bad. What could it possibly harm to put smoke into your lungs?” That's ridiculous, and doctors recommended certain brands of cigarettes, and all that kind of thing. Personally, maybe I'm being alarmist, but I really do think that EMFs and light pollution are going to be the two smoking type things of our time. But this...so this topic has a lot of skeptics.

What about the people who say there's no danger to it or like we're talking about, like the one I hear a lot is like, “These are such low levels, it's so much more dangerous to...” And they have all these things, like to use a hairdryer or to, whatever. What do you say to those people, and how do you answer that, the skeptics who say like, "It really can't be that bad."

Daniel: If you truly say that, you don't know science, there's no question about it. Let me, I'll take your analogy. In 1978, the head of Philip Morris, the cigarette manufacturer, was in front of a dozen pediatricians, and they asked the guy, “Hey, if you smoke and you're pregnant. Is that a problem?” And he said, “No, it's not a problem, except the baby will be a little smaller. And what woman doesn't want a smaller baby?” That was the mentality at that time. There was a preponderance of evidence by the science that we knew there were dangers and direct links to cancer at that time, and we had this propaganda that was running around telling us everything was fine. Well, you know, fast forward 20 years later, everything has to have a label on it and it says, “This is dangerous.”

Well, guess what? We've known for the last 20 years that we had problems with emissions. This is a non-ionizing radiation signal that clearly impacts the cell. We know with a preponderance of evidence in the science community, that there is a direct link impacting the cell. There is no debate. In fact, with the National Toxicity Program Study, it actually, again, was one of those peer reviewed, how can you wonder about the debate anymore? This is not a debate. Well, let me give you back...go back to this, the smoking space. Why is it common knowledge today? Well, it wasn't the science that was the problem. It was, they didn't lose in court yet. That actually, the turning was...of the mass market understanding of the problem was related to losses by the smoking industry in court.

And so, the question is, do we know enough now? Of course we do. Why doesn't everyone know it? Because there's a propaganda mix on both parts. Is something changing? Yeah. There are beginning to be real court cases and the industries are losing. So, I think it's going to take time. But to your point, Katie, before is, it's like if we have a sense it may be a problem, you really should think about it, and you really should think about how you do a protection for you and your family, and a little bit of precaution reduces the risks of those emissions, and there are things you can do.

Katie: Absolutely. So, you mentioned the word non-ionizing radiation. And I would love if you could expound on that a little bit, because that's the one thing I hear in comments every time I've blogged about this, people are like, "Obviously, you don't understand science because this is non-ionizing radiation, and so it's obviously not harmful. Only ionizing radiation is harmful." So, can you explain what the difference is, and why either one can be a problem?

Daniel: Yes, I'd love to. When you have an X-ray, when the dentist comes in and he puts something directly to your face and says, “I'm going to take a picture of you.” They put a lead weight on that loads you down, and they run away and they push a button. What's going on? That's a radiation, electromagnetic radiation that is an ionized radiation. What does that mean? It has the potential, under an exposure, to actually take an element of the cell and knock it out of its orbit. It takes the proton and it actually makes it a positive charge, it ionizes the cell. What happens to that cell then when it's been
It actually becomes part of the healthy cell, and it begins influencing the cells around it. That's what causes cancer. And guess what? They have this lead thing they put on top of you, so that doesn't happen to you.

Okay. So, that's the analogy. If you look at non-ionized radiation, what happens with non-ionizing radiation is, the cell weakens, the membrane weakens. It weakens, and then there's a calcium channel penetration within the cell, that actually then creates a nitride oxide build out. And when that happens, it mutates a cell, or it damages the DNA. Guess what? That's exactly what happened to the ionized radiation. It's a non-ionizing radiation impact, is identical over time under the right circumstances. And that science is very well understood. In fact, modern day technology, science in the last several years, actually can show you the steps of what happens to the cell under that penetration argument I just explained to you. So, there's no question whatsoever, the cell will mutate. It's just a different mechanic. It's not the same, it's not knocking a proton into a different orbit and making it positive, thus ionizing it. Does that help?

Katie: That does. So it's basically just not an immediate reaction, but over time, it's the same reaction. That clears up a whole lot.

Daniel: Yes, actually, exactly right. If I gave you a view, a science view of a cell's life, and I introduce ionized energy into that cell, and then I show you that same sequence, the only thing that's different is one was an ionized impact, another was a non-ionized impact. The result of the cell is the same, it has the same impact, it does the same thing. But as you point out, ionized X-ray, gamma rays, they kill you immediately. This is slow and you die more slowly.

Katie: So it's almost...I mean, I would make the correlation to food. There's things you can eat that are directly poisonous, that will kill you immediately, but there's also slower forms of poison that a lot of us... I mean, we try not to, but obviously that people consume every day, on a daily basis, that over time kill them. And just because it's not arsenic, and it doesn't kill you immediately, doesn't mean those foods aren't dangerous to you.

Daniel: Right, exactly. And by the way, if you use a cell phone for a couple of minutes a day, you don't have any problems, you don't have to worry about anything. Your exposure, your duration is very small, and it's extremely unlikely, and science proves it's unlikely anything will occur to you and to the cells that are within your body. You use it five hours a day and you saturate the cells themselves with this toxin, well, that's what's gonna happen. That's when you begin becoming more susceptible.

Katie: That makes a lot of sense. I don't want to be alarmist without giving people hope, and that's why I wanted to talk to you because you're trying to create very practical solutions for people to protect against this, because I think a lot of the reason that people kind of ignore the science about this and are afraid to say that it's dangerous is because, obviously, technology makes all of our lives easier and better in a lot of ways. It certainly complicates them as well. But I think a lot of people don't want to admit that there could be a problem because it's such an integral part of our lives, and my hope is that there's a way that we can, in the future, recognize that the body is an electrical being itself, find a way that these types of emissions can actually benefit the body versus hurt it.

But in the meantime, what are some of the ways we can protect ourselves against this? Because, obviously, none of us want to go live in the woods and avoid every type of electromagnetic frequency out
there. What are some of the ways? Let's start with cell phones, what are some of the ways we can protect from cell phone exposure?

Daniel: Actually I'm going generalize that for all emissions, from laptops, cell phones, tablets, wires. And here's a simple rule. When you are directly against the source, a cell phone touching your head, that's when the probability of danger is highest. If you take that cell phone and you remove it and you're 1 foot away, 80% of that danger is gone, by 4 foot, 98%. So, just stay away from it and you're fine. So, any time you have an environment where there are these emitting sources, make sure you remove as many as you can. I like to refer to that, by the way, as bees in the room. If you have one bee in a room, and that bee represents a transmitter for a cell phone, that one bee is unlikely to kill you. But if you have a thousand bees in the room, they can kill. So, the trick is, try to reduce the number of bees in the room, and stay away from those that are in the room and you'll be fine.

Katie: That makes a lot of sense. So like basically, the bigger your distance from a source, is that the same with like a Wi-Fi router or a modem?

Daniel: Yeah, exactly. If you have a router and it's one foot away from you, that's a big problem. It's in constant transmission over a long period of time. If you work in an office, you wanna just make sure you're not on top of it. If you put it 10 feet away from you, you don't have to worry about anything because the emission is... The danger is really, after 4 foot, is very low. So all you wanna do is make sure you are a distance away. Simple distance is your best friend. When you use it also, make sure... If you use that for five minutes, and then you put it down and you're not gonna use it again for a day, you're fine. There's no concerns that you should have, if you're using it five hours a day, as I said before, that's when it becomes... So, there's a distance, and then there's the time factor that you wanna be thinking about when you think about these things.

Katie: Okay. And you mentioned that for your sons, who were working on laptops, that you created a type of a shielding device, and since I do have to be on a computer more hours than I would like in a day, that's something I use as well, but can you explain how that works, like what the method is that it's actually stopping those EMFs from reaching the body?

Daniel: Yeah. Remember when we started off, we talked about what is electromagnetic radiation, and we talked about a finger and the ball becoming bigger, and bigger, and bigger. That's referred to as omni-directional, it goes in all directions, all EMF typically goes in all directions. So, the simple engineering challenge that you want to think about is, well, if it's going in all directions is there a way of preventing it from going in one direction where it's closest to the body? And the answer is, yeah, you can. You can simply mitigate the signal, it's still transmitting and touching everything, but on its path down, it's stopped. Those are the products stuff that we design, where we simply say, we're not a victim, you can use our products any time they're close to your body, and you'll know you're shielded between the device and the cells of the body. That's what we developed.

Katie: Gotcha. So it's essentially a substance that doesn't allow those frequencies through. So you put those between your body and the source?

Katie: Okay. So, I'll make sure, if anyone is curious what those are, I’ll make sure I’ll link to them in the show notes.

Katie: Just a reminder, that this episode is brought to you by Paleovalley. If you aren't familiar with them, I'll explain why they're one of my favorite companies that I found recently. They make, among other things, some amazing grass-fed beef sticks. These are nonperishable, they don't have to be refrigerated, so they're great to take along in your purse for hungry kids, but they are even better than that. There are a lot of different meat-based products out there, meat bars, beef jerky etc., but theirs stands out. It's made from 100% grass-fed and grass-finished beef, that was never given grain at all. It's also grain-free, dairy-free, and soy-free. But it's even better than that, their beef sticks are made the old-school method. They're naturally fermented, which means every single beef stick contains 1 billion CFUs of probiotics, as well as high levels of omega 3. So, these are snacks I feel great about giving to my kids, and that they love. And you can get a discount of up to 40% by going to paleovalley.com/wellnessmama and using the code WELLNESSMAMA10. That code will get you 10% off, but they also offer bulk discounts of up to 30% off, if you order in bulk like I do. So, check it out, I know you'll love them as much as I do.

Today's podcast is also brought to you by StudioPress Sites. Have you ever thought about starting your own blog? Or maybe you already have one. If so, you're probably overwhelmed by all the technical details required to get a site up and running. There is purchasing a domain name and a hosting account, installing WordPress, the themes, the plugins, then setting everything up to work correctly. And this is all before you've even started writing. I've been blogging for over 10 years, and I know all too well the many headaches and technical challenges that starting a blog can create, especially when geek speak is not my first language.

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And now, back to the episode.

Katie: Also there are other sources, and this is where I don't know the answers either, so I’d love to hear your take on it. Things like in houses now, a lot of people have smart meters on their house, which I've read those are also a source of EMFs. Do you know anything about smart meters and if they are in fact a danger at all?

Daniel: Yes, I do have a knowledge of it, and it is exactly like a cell phone, it transmits. What's different about it, it depends on the function of the smart meter. If it's in a maintenance mode, it can transmit every second, but many of them are every 15 minutes, every half an hour, every hour, so that they're not transmitting all the time. So, if you are concerned about the transmission of a smart meter, these are things you got to worry about. How close to that device are the humans in the house. If this is against the bedroom wall, and you're sleeping in it, and you're two foot away from it, that's a serious problem.
Because that's playing around with your melatonin and it's impacting your sleep, it's impacting everything potentially.

So, you want to make sure that with a meter, it's far enough away that if it's working, it's not interfering with your health. And by the way, we spoke about distance. If it's more than 10...20 foot away, you're fine. So, you don't panic about it, you just make sure that if you have it, you're far enough away so it doesn't impact your health.

Katie: Okay. So, I've also seen a lot of people that have these EMF meters that seem to measure EMFs, do those work the way that people think they do? Is that something someone can do to measure if it's gonna be, if they're a safe enough distance away?

Daniel: Those are indicators, at best. When you have those $3,000 or less meters, it sort of says I see something. Those things can be orders of magnitude, in terms of accuracy. But for the average person, it helps you see roughly what's going on. And most of them on the extremely low side, extremely low frequency side, 300 Hz and below, are reasonably accurate. When you measure RF with those meters, remember we talked about omni-directional, so when you turn that meter on, you are seeing reflections, you are seeing the cell towers around you, you're seeing the Wi-Fi, you're seeing your cell phone. It's seeing all those things, unless it's a directional meter. So, I would say they're a good indicator, that there may be something, but it's certainly not an absolute metric measurement.

Katie: Okay. Thanks for explaining that too. So, are there other things, obviously I'm going to link to the things that you have that are direct shielding devices for cell phones, tablets and computers. But are there other things we can do, we've mentioned distance and staying far enough away from something. One thing I do at our house is, I have all of our router and our modem and everything for the internet run through a surge protector that I just turn off at night, and like we don't put cell phones or tablets in the bedroom ever. And I know people even put those on airplane mode at night. Are these things helpful at all in reducing exposure, and are there other things they can be doing along those lines, that are also just free things everyone can do?

Daniel: You are exactly right, Katie. It's simple stop, turning off transmitters at night when you're not using it eliminates the transmissions that could impact your body. So, any time you can turn it off... I have in my home a device that turns off the Wi-Fi at night between 10:00 and 7:00 in the morning, so it's never transmitting. I think removing potential emission sources out of your bedroom is extremely important because of the duration of time, your exposures are over six or eight hours. So, when you have a cell phone on a table next to you, and it's a couple of feet away, you may be safe, but it's a constant badgering of a signal, touching the cells of your body, which do impact the integrity of the electrical systems of the body, and the operational function of the cells.

Even clocks that you have next to you or your bed. You always should put them as far away as you can, because they're generating extremely low frequency emissions, so you want to make sure you do that. When you use a toaster, those emit 150, 200 milligauss of emissions. So, stay away from them when they're on, stay away from any electronic device operating in your house, and make sure you keep it a couple of feet and you'll be fine. So, it's just watching where you are in your environment and trying to minimize exposures. Then you don't have the risk potential of any impacts to your body. Sometimes, these things are really hard to figure out, by the way, because a lot of the electrically sensitive people now become sensitive to everything.
In fact, you know, if we take the discussion we're having now, we actually talk to our customers with moving devices away using larger screens, and keeping them a distance away to try to minimize any of the exposures that are being generated by electronics. But the rule of thumb is, just try to push it away, and if it can be turned off, turn it off.

Katie: Yeah. I think that's super easy, and you shouldn't be using your cell phone in your sleep anyway. It really makes me think because I know I don't have teenagers yet, but I know of a lot of teenagers who sleep with their cell phone under their pillow or in their bed with them, which with even a basic understanding of what you're talking about, is kind of scary. So hopefully, any parents who have kids who are sleeping with tablets or cell phones in their room will encourage them to make a different choice there. Another thing I wanted to ask, so, obviously Wi-Fi is easy to turn off at night, you can make sure smart meters aren't in your bedrooms, that kind of thing. What about, you mentioned that even wires in the ground, and wires in the wall have a level of EMFs that they emit. Are these problematic, and if so, what can we do about it?

Daniel: Those are one of those things, the power that comes to a home and is distributed in a home is alternating current. It's a 60-cycle alternating current, which means if you were to look at the buoy in the water, and you would have watched the number of waves that go by, 60 would go by. So, extreme low frequency emissions that are in that space are dangerous, but they use the same rules as RF signals or microwave. You need to stay away from it. So if you have a light, don't put it on top of your head. If you have a chair, make sure it's not near a receptacle that's operating. There are practical steps you can take to minimize that exposure. And those distances of those typical in-house 60-cycles exposures, it's fairly simple to avoid by recognizing the sources.

But there is generally no real way of reducing them in some mechanical way, unless you really want to begin spending a lot of money with shielding jackets on the wiring, which mitigates the emissions into the room. There are a lot of things you may be able to do, but they're really, really costly. You can create what they refer to as a Faraday cage, where you can actually prevent anything from coming in, but that's thousands and thousands of dollars. Some people do it, but it's an overkill. All we got to do is avoid it a little bit and you're fine.

Katie: Okay. So, in general, for instance, like having wired Ethernet cables in the walls would be a lower level of exposure than like a Wi-Fi signal? Because I know some people have opted to have wired internet, is that true that having a wired internet or even electrical wiring in the wall is going be a much less exposure than a Wi-Fi signal or a Bluetooth signal?

Daniel: Absolutely. In fact, as I was mentioning before, we have clients who we coach, one of the very first things we do is ask them, “Well, how are you connected to your router?” And they all inevitably say, “Well, I use my Wi-Fi.” And so, what we point out is, they got to turn that off in the laptop. They gotta make sure it's completely off and they run a Ethernet cable to the router and it becomes a Ethernet switch. And this service is faster, and you’ve eliminated the dangers or the potential dangers of those emissions that are close by to you. So, simple wiring techniques like always go to wire line not wireless, is a good metric to consider.
Katie: Okay. That makes a lot of sense as well. What about outside sources like cell phone towers and like things that we really can't control in our own home? Are those a risk, or since they're far enough away, does that distance from the source come into effect there?

Daniel: Yeah, you're right. Any time you are living where there is a source, you really want to make sure before you buy, that source is far enough away where it doesn't bother you. When with cables with wiring or towers, you want to be at least 200 foot away because they are constant loads. And in fact, what's interesting about cell towers, there is federal law that allow cell towers to go into an area, but if you're within 200 feet of that cell tower, there's clearly evidence that we know, that the ambient, the level of energy within a room increases because you are directly under these towers.

Same is true with the 10,000 volt power lines. The really, really heavy duty stuff that runs on these metal framework holding these cables up, those can be dangerous too. In fact, you can take a light bulb, a fluorescent light bulb, and you can put it in front of that power level and it will actually light up. So, they're dangerous but you really want to avoid it. As simple as that, if you can.

Katie: Gotcha. So, I know that you said it's not necessary for most of us, but I wanna touch on what you mentioned, just to help define it for people with the idea of a Faraday cage. Because my understanding of this only comes from, my dad is actually an electrical engineer as well, and one of his graduate projects they were trying to do an EKG on a chicken that was still in an egg. And so, obviously, like you're talking about, trying to measure extremely small signals with this EKG, and they discovered they had to build a Faraday cage around it because even things like a watch battery or the wiring in the wall were able to disrupt it. So, just to explain for anyone who's not familiar, what is a Faraday cage and what did you mean by that?

Daniel: Yeah. You're right. That's why I mentioned to you before about the meters, they pick up everything, not necessarily what you think you're picking up, it's picking up a bunch of stuff. A Faraday cage is where you build a framework, a cage of metals, composites or...yeah, typically metals, and it's completely surrounding an environment. And what that does is, it doesn't allow any external emissions that are in the ambient, in the air to penetrate the space that's within. That's what a Faraday Cage is. It doesn't allow any form of electrical electromagnetic emissions to come in, static electricity, anything that may be within the air, to penetrate that space within the box, within the cage. That's what a Faraday cage is.

Katie: Okay. So, obviously not something that all of us need, but maybe someone who is extremely sensitive or, obviously, in cases like that, trying to measure very small signals, that would be the use for a Faraday cage. Are there, in case anyone is looking at building a house in the future, is there anything you can do from that perspective, if you're starting from scratch, to reduce the level of EMFs in the home? Like, I would guess wired internet instead of Wi-Fi would be one. But are there materials that actually do block EMFs from coming into the home?

Daniel: Yeah. Actually, we have several customers who have built homes, and what they did was, they focused on grounding throughout the house for all electronics, and jacketing all the wiring so they reduce the emissions that are found within the home. They actually line the walls, they create the Faraday cage, where they don't let adjacent transmitting sources penetrate the walls of the house by using silver mesh materials, nickel mesh materials. There's a lot of different things they can use to isolate that inside space from the outside space. It can be done. And there are places to buy that material from if you're interested and people actually do that kind of work.
Katie: Okay. That's fascinating, and I can't believe we've actually been talking for almost an hour. But I don't want to stop this conversation without talking about your new book, because I had a chance to read it, and it's fascinating. It's called "Radiation Nation" but I was hoping you could kind of give a brief overview of what you talk about, and what you hope this book will accomplish.

Daniel: Yeah, Katie. What happened is, we have so many people we talk to throughout the day, especially the electrically sensitive. And what we found was, oftentimes they had a lot of questions that were, "What's the difference between ionized versus non-ionized?" For example, the question you had. People don't know what the differences are, and when they try to figure it out it's fairly complicated. So, our objective really was to try to help people, general people, who are not medical community people, not engineers, but people who want to learn more about the subject matter, so they themselves can make intelligent choices for their lives, and that's what prompted the book. We give you a sort of the history: what's happened, how did we get encapsulated in this sea of electronics, where did it start, and how did we get here? And maybe even more importantly, how does it impact our children?

Are we worried about the signals touching our children, and is there a direct correlation between ADHD, leukemia, and other illnesses, that may occur from exposures. Then what we do is, we actually help you understand what electromagnetic radiation is. And so, we spend a little bit of time trying to explain it in such a way that you'll know the difference between ionized and non-ionized, you'll know the difference between Terahertz and Kilohertz, the various sizes of the signals themselves, we talk about the health risks and what science knows. This is not a mystery. We have a lot of knowledge in the science community, and we have many, many in the science community that are very vocal about the impacts to the body.

The Bio Initiative, for example, is one organization that over the last several years has been documenting worldwide study work, helping to clarify what it is in fact, are the dangers, and what aren't the dangers. So we try to point out those sources of information and describe really what they do, so you can have an understanding when you are making your choices. We do spend a lot of time with children, because...sort of as a side note, Katie, when I was doing design work for one of our sale products, there was a parent who bought their six-year-old child a wireless cell phone. One year after she got it, she used it incessantly, she died of cancer of the brain. And that really disturbed me because people didn't quite realize. You think you're being protected because there are standards that are protecting you, and the answer is they're not.

So the whole discussion about what the standards are, and their impacts to you, and what we know about it is described, so you can think through what the differences are and then what they mean to you. We describe the sources and the actions you can take to try to reduce those exposures. So we try to be a complete one-stop-shop for understanding electromagnetic radiation. And we were prompted to do this because we saw that there was so much misunderstanding or misinformation in the marketplace and so much trust and naivety to the environment we find ourselves in. So, we thought we could actually create something that could be informative to our readers, and let them make more informed choices. So that's what the book's about.

Katie: Yeah. I think it definitely does that. It was a fascinating read, and I'll make sure to link to that in the show notes as well so parents can check it out and... For parents listening, I always say, I think parents are the frontline in protecting the next generation, and that if all of us listening made choices to just protect our own children, that alone does so much. So, I really appreciate all the work you do in raising awareness about this, and helping give people practical solutions. And I love that you are very
balanced in your view because you're not like, “We need to avoid every EMF ever.” You talk about safe
distance, and free things that everybody can do easily in their own home, especially to protect their
children. So I appreciate so much, your work.

Daniel: Well, thank you so much. Yeah, it's funny, when we started on this venture, it was, "We are not
victims." There are things we can do, and it's clearly, "Let's not panic about it." And that's a little bit of the
smart meter, is panic. If you stay away from it, it won't bother you. "Doctor, doctor, it hurts when I get
close to it." “Don't get close to it.” So, there are really things we can do in our lives to bring that
went up live today. So, we'd like to offer that space for those who would be interested in learning more
about the subject. And also, I'm not sure I mentioned this before we started, but if your listeners would
like to think about finding more information that's current and sort of mirrored in the book, but we also
have in our website, defendershield.com, a whole host of data about what it is and what it’s not.

I always recommend people to look at that kind of thing, and if they're interested in buying anything that
they may think is useful in their lives, WELLNESSMAMA, the coupon code can be used and they get 10%,
if they buy more, they can get free shipping as well, so.

Katie: Wonderful, I appreciate that. And I'll make sure to link in, to also include...but the coupon code is
WELLNESSMAMA, all one word, for anybody listening and I'll make sure that there's links to that in the
show notes as well. But thank you so much for your time and for explaining all this and for your
resources. I'll make sure, I know you have some great resources on your website explaining all this as
well, so I'll make sure to link to those. And again, I appreciate your time so much, this has been a really
fascinating interview.

Daniel: Well, I'm so glad... By the way, our biggest audience is mothers between 25 and 60. It's like to the
point you made before, it is really the matriarchs of the family that seem to be on the quest to understand
the dangers to their children and their families. And I so appreciate you giving us an opportunity to share
this to your audience because we know they're the ones who are looking for the information. And I'm not
telling you to buy anything from us. I don't care if you buy anything from us, honestly. What I want you to
do is understand the environment you live in, so you can make choices in your life to better your family
and yourself, for that matter.

Katie: Absolutely, yeah. Keep your children a safe distance away, don't let your kids sleep with the cell
phones under their pillow, and just learn the simple ways you can protect yourself. And if you are like me
and you do have to be on a computer for your job, then thankfully, there are things that shield you and
you guys have those, but I appreciate your work on the education of this so, so much and I appreciate
your time. Thank you so much for being here.

Daniel: Thank you, Katie, I appreciate you inviting us.

Katie: And thanks to all of you for listening. I'll see you next week on the Healthy Moms podcast.

Katie: If you’re enjoying these interviews, would you please take two minutes to leave a rating or review
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families could benefit from the information. I really appreciate your time and thanks as always for listening.