Introduction and Background in Family Medicine

Welcome, Dr. Pawluk I am so glad you're here. I'm going to ask you to introduce yourself, explain why you've become such an expert in post electromagnetic fields.

Bill, take it away. Thank you very much. Should I call you Terry or Dr. Wahls? Terry is. Fine. So thank you, Terry. So my background is family medicine.

So I did family medicine for many years, and I was a medical director for a family medicine group in New Jersey who had 14 family physicians, the biggest family medicine group in the whole East Coast.

And so we shared patients a lot. And one over a period of a week or two weeks, we actually had two admissions for GI bleeding. One person almost died of gastric bleeding.

The commonality for them was ibuprofen. And so I kept I said to myself, this is stupid medicine. This is like the definition of insanity. Doing the same thing over and over and over again, not expecting any bad things to happen, never were good things, but bad things to happen.

So anyway, so I said I decided to study acupuncture and find another solution for pain management that was not going to harm people or hurt people. And during my studies with acupuncture for that 1990, people didn't know what acupuncture was yet in this country.

And so I had to find a different way of doing acupuncture like treatments without using needles. So then I discovered that in the Orient they were using a lot of magnets on acupuncture points.

And so I started using magnets and discovered that the magnets were doing a bunch of other things in addition to acupuncture. They would they would improve healing of wounds.

They would decrease inflammation in local tissues, which are things that you don't normally see with with needles, acupuncture, needles. And the more I worked with magnetics of all kinds back braces, show inserts, magnetic necklaces, bracelets, pads on the body, pads on a bed, etc.

The more I discovered that again, magnetic fields did a lot more than just acupuncture. And so essentially I moved away from acupuncture and just looked at magnetic field therapies and began using them more extensively.

Eventually, I, as I tried to understand the literature, most of that literature was buried in Eastern Europe, was buried in German, Russian, Ukrainian, Polish, not English or you had this little abstract snippet, as you've seen, if you go to PubMed, the little snippets.

So along the way, I met a doctor, an M. D. from the Czech Republic, Dr. Jarvik, who had translated a lot of that literature on magnetic field therapies, or his Ph. D.

in rehabilitation using PMS for rehab. And he had his manuscript. It was pretty rough. So he gave me the manuscript and we put it together and basically published a book called Magnetic Therapy in Eastern Europe, our review of 30 years of research.

So that book, I don't recommend it for the average person. Clinicians might like it just to see what the history is, but it's really too technical. It's really some are highly summarizes a lot of abbreviations so that so but that convinced me that this technology had a really sound physiologic basis.

Mm hmm. It was good clinically, but there was some really good understanding, some of the mechanisms behind

PMF. So what they did in the body. So I started working with magnetic systems from Europe, purchased whole body magnetic systems, used them for quite a while.

And, and after about 30 years total of working with magnetic fields now I published two books. One is called Power Tools for Health and Power Tools for Health was again to provide more science for people about the use of magnetic fields.

So I discovered over the years of reviewing the literature that there are about 25, 27 different actions of magnetic fields in the body physiology, check responses of the body to magnetic field stimulation, and they form the basis behind what magnetic field therapy does.

We're used to think in terms of a disease or maybe even a symptom and a method, and you have a treatment.

Discovering Magnetic Field Therapy

Each disease, each symptom has its own specific, unique treatment, which is not true. Magnetic field therapy has about 27 actions and probably even more, and they're all unique by themselves.

So it doesn't matter what the disease is. All of these actions happen in physiology, whether you're a dog or an elephant or a human. But also I reviewed about 50 different health conditions and presented the science, the studies that have been done for those different health conditions.

And one of those health conditions and in fact, that's in my Power Tools for Health book is MMS Multiple Sclerosis. And there are numerous studies with the use of EMFs with MMS.

Now we should stop. Let's define PMA. Not everyone listening will will know what that is. All right, perfect. Thank you. So PTM stands for pulsed electromagnetic fields, and the elephant in the room is EMFs.

So everybody talking about EMF, 5G, microwaves, cell phones, wi fi, all of that, those are categorized as EMFs. I call those environmental of magnetic fields.

Yeah, big difference. That is right, Dr. Magnetic Fields. But they're environmental. Yes. There are two basic kinds of magnetic fields. That was three.

One is the static magnets that I started working with and stopped using because they are very limited in what they could do. And then there are the PMS, which actually were discovered and used way before EMFs became an issue.

Mm hmm. So the difference is that e amps are broadcast into the environment. They have wavelengths, whether it's microwaves, whether it's radio waves, whether it's TV waves, whether it's radar.

You name those that have wavelengths. And so they go on forever. So I call those open loop pulsed electromagnetic fields are created uniquely by current flowing through a wire.

And this is what we call the right hand rule. The current is my thumb. The wire is my thumb, and the magnetic field is developed in a current flowing through a wire, perpendicular to the flow of the current.

But as the as the current pulses, you know, like with the power line, currents are like 50, 50 cycles per second or 60 cycles per second and it's pulsing at this rate.

So it's going up and out and coming back. It's collapsing on itself. Every time the current flows are pulses, the current, the magnetic field pulses out and comes back down again.

So pumps are designed for health use? Yes. They're not designed for communication. Yes. Yes. And the risk of EMFs is because they are wavelengths, particularly the Barry amps, if you will.

The wavelengths are extremely short and because they're short, they get absorbed by the body. And so that's the purpose of a microwave oven. It's extremely short.

Magnetic fields are the magnetic fields of matter, electromagnetic waves. And as a result, they cook. Yes. So that's a very different use of a method.

We use radio ablation to kill nerves and to burn warts and tissues. So you can. Yeah. For destructive purposes. But again, they're destructive. They're not healing, they're destructive.

Whereas P and FS are not destructive. They are healing. So for that particular purpose. How does the PMF work then? So once a magnetic field is produced, it basically goes out and it comes back as it goes out my arm.

So as it goes out, it was basically into my arm and comes back out again. It moves in and out. Pulses in and out. Okay. Think of it. A better visual would be the wind. Yes.

The wind is blowing through the trees and we are the only way we know that we have wind is the leaves are moving. Yes, yes, yes, they're moving. So the same thing happens with the magnetic field in the body.

It's like the wind. It goes into the body goes completely through and back in again. We're back out again. Took out the back end. And as it's pulsing the it's as if the body wasn't even there.

So the body is basically completely invisible to a magnetic field. Wow. The magnetic. So the magnetic field ignores the body. Doesn't even know it's there.

Yeah. Yeah, already knows it's there. So as the magnetic field pulses into the body, it goes in through the tissues and back out again because nothing in the body stops the magnetic field bone, brain, fat, skin, muscle doesn't matter.

It's completely transparent to the magnetic field. But as it passes in and out, pulsing in and out, what it's doing is it's creating charge, it's creating current, it's creating basically increasing the energy levels in the tissues.

So the body reacts to that magnetic field through induction. So there's an induction of a magnetic field by the tissue, by the body itself. The magnetic field doesn't do the charge.

The body does that charge. The magnetic field interacts with ions. I'll give you an example. Faraday's law that this is all the principle of Faraday's law.

Faraday, Michael Faraday, the 1800s discovered that if you take a loop of coil, a copper wire, and you put a light bulb in that circuit, and you close that circuit and that pulse of magnetic field into that circuit, past the copper wire, the light bulb lights up.

That's called induction. And yes, he said that the higher the induction, the higher the magnetic field, the faster it reaches its peak, the more charge gets produced in whatever, including the body.

So the magnetic field then is interacting with ionic structures, anything with charge in the body. So every molecule in the body has a charge positive or negative.

Essentially the very few that are neutral, but mostly proteins, fats, cell membranes, cells themselves, mitochondrial membranes, etc. all of these are basically charged carriers and as a result the magnetic field is activated.

All of this, and that's what ends up producing. There's about 27 different actions in the body. And of course, everyone listening here, cells, they're very much electrical organs.

How Pulsed Electromagnetic Fields Work

Most of our cell membranes work in communication depends on that charge. So this is talking to our cell membranes, talking to all of our receptors in in your experience, apparently it's doing helpful things as opposed to harmful things.

So how how does this p mf reduce pain and in your experience? Yeah, what's a sense for that? Sure. Let's back up a little bit more. Let's go back to the 27 different actions of magnetic fields.

So the question becomes what causes pain? As one of the actions of magnetic fields? So perhaps have two actions relative to magnetic fields. One is it has a natural painkilling effect like Tylenol, anti gnosis, sedative, it's called so natural painkiller effect.

The second thing is the cause of the pain. So if all I do is to treat the pain itself, we're not doing a great job with magnetic field therapy. You might as well just give somebody a narcotic. Right.

But that's not our goal. Our goal is not to just reduce the pain, because if you all you do is reduce the pain, it comes back if you don't take care of the cause.

Now, you're absolutely right. So the goal then with chemotherapy is to reduce as much as you can the cause behind the pain. And that requires some degree of healing.

It may require improving circulation so you can get pain from lack of circulation to tissues. Leukemia, right. You can get pain because of inflammation.

Inflammation is caused causes swelling in tissues, which then causes distortions of nerves and causes decreases in the ability of nerves to conduct. Or the nerves become hyper irritated, hyper excitable.

It can also cause decreased production of ATP, decreased production and function of mitochondria. So all of these are different components of the actions of an injury to a tissue that then results in pain as one of the byproducts of that path, a logic process or pathophysiologic process.

So any sense? Yes, that process can cause pain. So then the goal then would be to try to remove that. So one of the key functions of PMF therapy is to improve circulation.

Another key function of PMF therapy is to decrease edema. Another is to decrease inflammation. And most of the time this is the one that I rely on the most.

Yes, ischemia is usually pretty obvious, right? If you put a band around an arm, you're going to cut off the blood supply, you're going to get pain in the heart or whether it's a shoulder or whatever.

The scheme is a major contributor to pain. So that circulation becomes important. But inflammation is the most common cause of chronic pain, right? And so definitely inflammation.

And along the way, if you have a two approved circulation because again, the magnetic field doesn't decide what the body's going to do with it, the body decides what it's going to do with it.

Mm hmm. So you presenting the stimulus, and then the body says, okay, I could use this energy, and what am I going to do with it? Well, I'm going to obviously, I'm going to prove circulation.

I'm going to have a painkilling effect. I'm going to reduce inflammation, etc.. So all the different actions of magnetism. What are the key actions of magnetic fields, of course, is acupuncture.

And one of the best uses of acupuncture is pain reduction. Why does our acupuncture reduce pain? It's stimulating endorphins and encephalitis. It's increasing serotonin.

It's starting to stimulate all kinds of neurotransmitters in the brain, in the body. Yes, yes. It reduces cytokines, it

reduces mass cell releases and so on.

So all of these are sort of secondary actions that have acupuncture. So a magnetic field does all that, too. So every time the needle. Sir, that sounds pretty good.

Yeah. You're getting free acupuncture at the same time you're doing magnetic therapy for other reasons. It is this magnetic therapy. A local wand that I'm putting over a part of the body.

Or how do we deliver that? All right. So the second book called Supercharge Your Health with therapy, I go into different types of devices. So if you got local devices that are you have devices to treat a chest or a belly or you have devices that would treat the whole body.

So you have to kind of pick and choose the machine, the equipment you want for that, for your goals. Yes. And then you could have very low intensity magnetic field devices and they're available in the market, which I don't advocate.

And I'll tell you why in a second. But you can have variations of intensity going from anywhere from about, let's say half ago so Gauss is a measure of magnetic field gave us s are goths or crows so the earth's magnetic field is half a goes on average.

That's okay. All right. So you can have my machines that are lower than the Earth's magnetic field, but the Earth's magnetic field is static. So if you pulse on a magnetic field, even though it's lower into the Earth's magnetic field, they're going to interact and produce a more dynamic response.

And then you increase the intensity going up upwards as much as an MRI machine. You could have magnetic fields that are 10,000 Gauss one Tesla to the right.

So you have a range, huge range of intensities. And that's important because what we've found out, research has shown that magnetic field therapy, by decreasing inflammation, one of the mechanisms of action to decrease inflammation is to stimulate the adenosine receptor.

And the adenosine receptor is very important in inflammation, both acute inflammation and chronic inflammation. The ideal magnetic field to reduce inflammation turns out to be 15 Gauss.

So at the adenosine receptor, which sits on the neutrophil, then the magnetic field stimulates that adenosine receptor optimally needing 15 gauss. So then you have to have a minimum of 15 gauss, but 15 gauss is only going to work superficial like basically in the skin because magnetic fields drop off in intensity very rapidly, just like we have with radiation, ionizing radiation.

So magnetic field therapy is a form of radiation, but it's not ionizing. It's not damaging or harmful, but it still has the same principles like sound and light and heat and cold and so on.

They drop off very rapidly as you move away from the source. So in other words, a in order you have to deliver 15 gauss at the tissue. That means you have to calculate like we do with ionizing radiation.

We have to calculate the dose of the magnetic field that you need at the target. Sure, sure. Six here spent a lot of sense. So for the brain, for example, for M. S, you want to stimulate across the skull.

And again, the skull is transparent too. The magnetic field goes right on through.

Pain, Inflammation, and Treatment Delivery

As a result, if you want to deliver 15 gauss across the whole brain, you're going to need to have about a 4000 Gauss magnetic field. Wow. Are there devices like that?

Absolutely. I work with those every day. Okay. Sign me up. So, yeah, when we get to mass, this is to the specific topic of mass and magnetic field therapy is amazingly important and helpful in mass because again, if you deliver, he has the right magnetic field intensity, then you can actually heal the lesions, you can heal the plaque.

Okay, so have you seen this work? Tell us more. Tell us about some of these cases. Yeah. So what you do is you do MRI's and so MRI's show you plaque and MRI's are variably helpful in distinguishing the full dimensions of the lesion. Right.

So this plaque is, in a sense like a volcano. It's called a penumbra. If the center of the volcano where the most damage is. And as you move away from the center, from the top tip of the volcano, as you move farther and farther away, there's less and less damage as you move away towards the base and farther out into the environment.

Well, the same thing with the plaque. You have the center area of the plaque that has the most ischemic actions or the most inflammatory action or the most tissue killing action, apoptotic or necrotic.

Yes, right. It can produce necrosis which basically kills the tissue. So as you move away from it, then you get more and more functional change as opposed to pathologic change at the highest density of the plaque, you have dead tissue.

And one of the caveats about magnetic field therapy is magnetic field therapy does not raise the dead. Yeah, that tissue is dead tissue. You can make it a part of your looking scar, but it's still a scar.

But as you move away from the dead tissue, you start to have variations and degrees of pathologic and functional. Okay? So as you move farther and farther away, the magnetic fields going to have the most impact on what can be changed.

On the standard tissue that is struggling but is still alive. And still alive. And if you do the magnetic field therapy, then that tissue has a chance to recover and live out its full life, or at least live out a reasonable amount of time before it gets replaced apoptotic by the way, the brain normally heals and cut out problematic tissue.

So how many? How many sessions would one need to recover the marginal tissue? All right. This is something that you and I say all the time as clinicians.

When am I going to get better? Yeah, people hear I hear that all the time. All the time. So what's the answer? Well, terms it depends on depends on many, many.

Things, many factors. And the same thing happens with chemotherapy. So the again, the more damage the tissue is. And we know that brain cells don't heal.

Well, I think it takes a lot of work for a brain cell to recover to its full optimal functioning. And even if it's not 100% normal, it can still function for quite a while.

And so if you can improve the function, so PMA therapy basically works at three and three sort of phases if you will, like with pain killing the natural nociceptive effect.

So you can improve physiologic changes. Right, very, very quickly by improving circulation, by decreasing swelling, by changing, by increasing neurotransmitter production, by increasing the ability of the cells to talk to each other.

All that happens very rapidly. So that's the physiologic phase. Basically what the magnetic fields are doing. The second phase is to improve function.

So the more physiologic improvement you get, then you begin to see improvements in function and that could take a longer time function depends not only on improving physiology, the function also depends on healing, recovering the tissue.

And so what happens then is that the healing component of this is the most important and in a therapy has actually been found to increase the growth or development of neural stem cells.

Oh, my goodness. That is huge. Everyone. STEM cells, stem cells. Neural stem cells, you get a 400% increase in neural stem cells at about 150 growth factors that go with those stem cells.

Those key. You have the capacity then to heal the brain. So you have the capacity to heal the damage to the extent that it can be healed. So do these kind of devices exists or is this only a research.

To use it? I use it all the time. Okay. Tell us more. So again, when when you deal with mass, what are the problems of the mass? So we talk about MRI and plaque. Hmm.

You can do MRI as we do a functional MRI, as you would expect scanning. And so we do different functional tests of the brain. So the MRI that a classic MRI doesn't tell you function, it gives you some sense of the amount of damage and how much possible residual benefit you're going to get.

And we see this with stroke all the time. You see this with TBI. So magnetic field therapy, by doing all these things, you can improve spasticity, you can improve fatigue, you can improve walking motor function, you can improve pain, you improve circulation, you can improve cognitive function, you can improve speech function, and you can again improve brain functions, ability to communicate.

Correct? I've seen all these things with magnetic field therapy. So are these big devices that I would come into your office. So I, I, I tried to dose my phone, but a message came through without a call.

Okay. So there are degrees. There are, there are some, some devices that are about the size of cell phone.

Using PMF for Multiple Sclerosis

Well, okay. There are some devices that are and it depends on the control unit. So controlling it, it's going to be small. And what you're doing again with the magnetic fields, you're passing the current from the control unit, you're passing down a wire into a coil. Yes.

Can be a size of a quarter. Are they can be the size of a whole body. Yeah. Yeah. Right. So you and you can get systems that will give you that range of choices in the same system.

You can have local treatment for like an elbow, a shoulder or back of the neck. Fact I use a PMF device every night for sleep at three hertz at Delta.

Yes, it's a frequency and I use it all night long and my pillow to help me with sleep and it's it's small, it's portable battery. Operate like a small cigaret box.

Wow. And the coil itself is about that big. Yeah, yeah. It's small, but it's about two inches to three inches. So you can go from that all the way up to devices that are like TMS.

Oh yeah. And explain TMS for people who may not know. All right. So TMS stands for transcranial magnetic stimulation, which means the magnetic fields going through the brain across the skull into the brain. Yeah. Yeah.

The TMS machines have a whole system that's like this. They're big. And you put them on the on on the brain for treating depression. That's what they're approved for by the FDA treatment resistant depression.

But there's a lot more application than the FDA indication. Yeah, absolutely. And what they do with TMS for depression is that they're powerful enough to stimulate or generate current in the brain.

So they put the coils over the motor cortex, over the part of the brain that controls muscle movement, and they increase the intensity of the magnetic field in that spot until they get a hand movement.

So now Boston. But it's basically like a like a twitch. Yeah, right. So that's called the motor threshold. And then they will take that threshold and that would put the applicator on the front of the head and they'll go up to 120%, about 20% more than the motor threshold to stimulate charge production in the brain.

TMS was developed originally to replace ECT electroconvulsive therapy. Yeah. Yeah. Safer. You don't need anesthesia and it has a lot of the same benefits.

It may not be quite as powerful, as effective, but then it's not as barbaric either. Yeah, right. Right. So basically what you're doing then is you're stimulating the brain with this magnetic field and now you can find you can treat Parkinson's, you can treat M. S., you can treat, let's say ALS, you can treat brain injuries.

But you did a review paper, published a review paper in the Journal of Science and Medicine on the use of TMS, but not TMS. That kind of teams with other magnetic field therapy devices for TBI, for brain injuries, and there's a pretty substantial literature showing a tremendous benefit of magnetic field therapy for brain injuries.

So we're doing it for brain injury. What's it doing for other problems like Ambien? Like Parkinson's? Sure, sure, absolutely. So are you using these small portable devices then for M M's?

Okay, so small. Yeah. Let's talk about what I would do for me. Yeah. Part of the problem is what what? What is your m.s? What are you experiencing with your arms?

If you have somebody who's in a wheelchair already and is incontinent physically or with bladder incontinence, well, then you got to add a more severe level damage. Right, with their arms.

But if you have somebody who just got some plaque and maybe had some optic neuritis, you don't need something quite as big or a strong. So you can use that small little device to help, to talk with sleep.

But it's not strong enough because. 200, 200 Gauss. Sure. Okay. Gauss will deliver to 15 Gauss only in about half an inch. So it's not going to. Be right for you.

Very well. But for inflammation management, it's not going to be ideal. So most of the time I want to be using devices that are more powerful. So you need to have a machine that's going to have probably a minimum of 4000 Gauss to be able to treat.

Transcription. And that's the goal you have to treat from scratch. Yeah. Yeah. And you got your MRI's and you know where the lesions are are, you know, in terms of symptoms where some of the problems are as well.

But MRI is going to guide you where you or your lesions are, whether you have it in the neck or you have it at the thoracic spine, you know, most of them are going to be in the brain or in the in the neck, cervical spine, rarely.

You don't see very often thoracic spine. But, you know, they do happen to. Yeah, absolutely. What you you can use for treating the brain. You can use for treating the spine.

And if you get the right magnetic system, you can actually run two channels at a time where you could treat both simultaneously. Wow. And then that that decreases treatment time and those devices that are like, you know, again, you have two applicators that are running at the same time, at the same level of intensity.

I would get the best results the fast. So in other words, the total treatment time that's needed for that would be a lot less. Wow. So are these commercially available in the United States?

So in both of my books, Power Tools for Health and Supercharge Your Health, and on my website, Dr.

Devices, Protocols, and Clinical Support

Polycom, DARPA, w al Yukon. Dr. Popcom on that and that popcom I have a product comparison guide where all

the different devices that I've worked with and I recommend and use. Yes.

And then there's a store. So people go to the product comparison guide or the store on the website or in the books. Again, their charts of the different machines.

Wow, this is excellent. And then so if someone got a device began, do they have to work with their a trained physician to set these protocols up or. Well, what do you think?

Well, I'm thinking that people can probably set up the devices with a little bit of help. But the that's what I do. That's what. Yeah, that's what Dr. Popcom does. Yeah.

The biggest problem for most people as they end up buying machines or equipment based on some salesperson selling them something. Yeah. And the salesperson doesn't even know what they got.

The salespeople don't even know the intensity of their machines. And I mentioned that you need a minimum of 15 gauss. Yeah. And if you could treat transcranial, you need a minimum of $4,000.

So you need to get the right piece of equipment. And then if you do that, then supercharge your health has protocols, has general recommendations for how you use the magnetic fields as some supplement recommendations.

Anybody who works with Dr. Polycom, we provide free consultations. Okay. We'll tell you what device will be best for you. We'll tell you how to use it.

And then we provide you with ongoing support for for you to be able to get the most value out of your equipment. Sounds really quite remarkable. Now, Bill, in addition to Emsc, because this site is for people with no immune conditions, I'm imagining people with showgrounds, with a A with budgets, narrow sakurada assist.

So a wide variety of autoimmune diseases that attack, they're either the peripheral nerves or their cranial nerves or their brain or their brain directly.

What do you think? Would those people be helped as well? All of them. All of them. Because what's the common factor? Yes. And then I think, you know, the diabetic neuropathy is.

Piece of cake. Okay. So but diabetic neuropathy is better actually than idiopathic neuropathy where you don't know it. Well, the reason is that you don't know what the cause is.

So if you don't have cause, then it's harder to see the symptoms. So a diabetic neuropathy, one of the most important things that people have to do for that is they provide circulation to those nerves.

Yeah, yeah, absolutely. Right. And then those issues. So diabetic neuropathy response really? Well, I have a I have a picture of a a relative actually who had Charcot foot from diabetic neuropathy.

He was a type two diabetic, had it for a very long time. Poor control. He started developing a Chako. What? Which means the bones are basically crumbling because the bones don't have adequate vascular supply due to the tiny little blood vessels that feed the bone.

So as far as bones started sort of falling apart, he was under standardized standard wound care for about two years. The ROP was not getting better. The wound was bad, oozing from the from the foot, the bottom of the foot, his same podiatry scene, all kinds of wound care people.

We got him on a portable battery operated magnetic system. Within one month, his foot went from this to this. Wow. Wow. Now, here is another problem that I see.

People struggle with small a chronic idiopathic demyelinating sleep, you know, chronic idiopathic demyelinating

polyneuropathy. Have you had any of those folks?

We asked. We've had a few of those. I did consultations on a few don't have a huge series and they do better to the challenge that we have with nerves.

Again, nerves don't heal well. Yes. Right. They take a long time to heal and people have to have the patience to continue their magnetic field therapy, to let the nerves heal.

But you can improve circulation, you can reduce pain to improve sleep.

Autoimmune, Neuropathy, and Recovery

So a lot of functional improvements you can get with these individuals and don't directly cause the nerve to be normal tomorrow. Correct? Correct. You know, if a nerve is regrowing from the brain all the way down to the toe, I believe I was recall something like seven years to make that path.

I presume that this would facilitate a little faster recovery time. Would that be correct? Yes, because one of the things that the magnetic fields do is they increase DNF.

Yes. Yes. And other nerve nerve growth factors so that you are and studies have been done in rats where they did sciatic nerve to cut through transfected sciatic nerves and that did magnetic stimulation and it followed those nerves with after with magnetic stimulation and found that they started getting sprouted.

Okay, excellent, excellent. Right. So we know we can recover. The problem is getting them to reconnect properly. And does this have any assistance there?

Well, it takes too long. So the problem is that a lot of this research, the animals don't live long enough and the research doesn't go on long enough.

So what happens is that you often see people with numbness and, you know, if you're numb at the nerves, almost the nerves are basically dead or pretty well dead.

Yeah. Yeah. Paresthesia is they start having numbness and tingling. They started going from numbness to tingling. That's a good sign. That's a very it's a good sign.

So that means those nerves are recovering. So there's a chance then over a period of months, typically months to even a couple of years with the regeneration processes of the nerves that you can get some reasonable recovery of the nerves 100%.

Well, I tell people I'm an M. D., not a Jodie, to give me everything you want. Yeah, yeah. A good relationship with God. Yeah. Yeah, it is absolutely helpful.

Well, this has been really very, very informative. I appreciate your taking the time to chat with this us again, how people get to your website. And so it's Dr.

Pollack, DARPA W l u k dot com. Okay. And everyone listening, Dr. is going to have a gift for sure and download that you'll get some great, great info.

And Bill, thank you so much. I've used PMS for many years and yes, that certainly has been a very helpful tool. Now much love to you and your family and I look forward to seeing you, hopefully at a another a forum conference.

I wish you very great success with your summit. Thanks, Bill.