Pulsed Electromagnetic Field Therapy (PEMF): Effects on Medical Conditions Transcript

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Introduction and Guest Background

Welcome to another episode of The Telomere Summit, sponsored by Doctor Summit. I'm Doctor Joseph Raphael, your host of the Telomere Summit, and I'm very happy to have here today with me, doctor Bill Pollack.

Who, we'll be talking to us about PMF and his interesting journey over the past 30 years toward, toward using it to help patients with many conditions and the aging process overall.

Welcome, doctor Paul. Thank you, Doctor Rafael. Doctor William Pollack, MD and miss of Science, is the author of Supercharge Your Health with PMF therapy and was recently a holistic doctor in Baltimore, Maryland.

Previous academic positions he held at Johns Hopkins and University of Maryland. He has training in acupuncture, homeopathy, hypnosis, energy medicine, nutrition, and body work.

He is considered the foremost authority on the practical use of pulsed electromagnetic field therapy in North America. He is interested in holistic pain management, sleep anxiety, anti-aging, tissue healing, and general health to promote the healing value of emfs.

He has well over 50 radio, podcasts, magazine and TV interviews combined. He has also been a co-host of a two hour holistic health radio show in Baltimore for ten years, and most recently he hosted the Pain Solutions Summit, interviewing more than 30 experts on helping people with chronic pain.

He has recently been awarded the ACIM Lifetime Achievement Award in 2019 for work with Pmfs, and is Maryland's top preventative medicine specialist award in 2021.

His new book, Supercharge Your Health with PMS, is a practical, hands on guide to EMF treatment. How to select and properly use the right PMF system for over 80 different health conditions, and cuts through the online confusion about EMF devices, all based on his extensive knowledge and clinical experience with PMS.

And we'll show you those books at the end of of the, of this broadcast. So welcome, Doctor Polak. I'm a bit of a neophyte, when it comes to PMF, but, our conversation that we had in Las Vegas was really interesting.

And, I'm really happy to have you on on this episode today. So I'd love to start, as I often do with, telling us, you're telling us about your journey over the past 30 years from sort of traditional medical training into PMF and, and how you got to, to be where you are, in this field.

Well, thank you, for that intro. My background, basically, I'm an M. D. and, I was in charge of a large medical group by 30, 30 clinicians in new Jersey.

And we shared patients, did rounds to, you know, on mutually on our patients and a very short period of time. I had a couple patients admitted to the hospital with GI bleeding.

And in evaluating that, one of them almost died and evaluated that the cause was, related to ibuprofen. So all of them, both of them had been on a long term ibuprofen.

And I realized at the time is that if I look at my consultants, I thought about what options were available to me. I didn't see any better options than what already existed.

Now, again, that was back in the mid 80s, so there weren't that many options. So opioids and ibuprofen, Tylenol.

From Conventional Medicine to Magnet Therapy

And then the consultants and all the other things that they did, the procedures, etc.. So, so I had to do something different and it couldn't be within the House of medicine because obviously I knew what the options were. There.

So I decided to study acupuncture. And when I started doing acupuncture, people were refusing to do needles. So that was in 1990. Right. Yeah, sure. I went for acupuncture back then. Right.

So then, having studied that and couldn't use needles, people, then I thought, well, I have to find a different approach. So I started looking at, using magnets on acupuncture points.

I knew that in the Orient in Korea and, and, and also in China to some extent, they used magnets on acupuncture, on small, little tiny magnets that you place them on acupuncture points and stimulate a point that way.

But we know now that you can stimulate acupuncture points in a lot of ways, including like heat, friction, pressure, and so on. Well, it turns out that the magnets were doing different things than just acupuncture.

I would see lesions disappear under the magnet. Wow. And I had a personal experience where I had a spider bite on my leg. And I didn't realize I had that I'd been bitten at that point.

It was not that itchy or painful, but I looked down. I had a quarter sized lesion on my leg, so I put a magnet on it, and I was reading on my patio, three hours later on.

Just a regular magnet. Regular magnet, fridge magnets. Wow. Three hours later, it was gone. When you and I know that, spider bite is going to last a week to two weeks, perhaps I can start it right away.

I caught it right at the very beginning. So basically, just melted away. And that's one of. So that again became very intriguing to me. What's going on here.

It's not just acupuncture stimulation. There's a lot of other things going on in the tissue related to the magnet. So as I started working with more magnets and discovered a lot of different actions, started using magnets of different kinds around necklaces, bracelets, back magnets, flat magnets, all kinds of magnetic systems.

And they are all doing very interesting things. Was not in my paradigm as an MD, right? I think that what is going on here, in fact, I actually visited with a, a PhD, chief of bioengineering at Hopkins and said, what's going on here with these static magnets and biology?

I don't know, it doesn't make any sense. I said, well, clearly makes sense to me as a clinician because I see the results of benefits all the time. Say, well, I'm used to time varied magnetic fields, pulsed magnetic fields.

I know what they can do, but I don't know what a static magnet can do. So I started working beyond that. That intrigued me as well. So I started working with past magnetic fields time, what I call time varying magnetic flux.

So a static, a magnet, a fridge magnet is a static magnet. It's not varying in time. It's permanent. So, if you want to make it more dynamic, you start to vary the magnetic field.

Right. And that's where pulsed electromagnetic fields come from. Right. And a magnetic field is produced by a current flowing through a wire. People are worried about power lines, right.

Because the magnetic fields they broadcast. Right. Even though the current is contained within the power line, it's still producing a pretty large magnetic field.

And so I discovered, in fact, that pulsed magnetic fields were much more dynamic, could reach much deeper in the body, could do a lot more, stuff, you know, a lot more, provide a lot more help to people with different problems.

And along the way, I met a doctor from the Czech Republic and my PhD doctor, Jerry Jeremy, and he had his PhD was on pulsed magnetic field therapy. Oh, right.

So here's an M. D. trained M. D. and got his PhD and Pmfs. So he translated a lot of Eastern European literature. When I tried to find the literature or the science to support what magnets could be doing in the body, it was always very difficult to find, I think, almost impossible.

And what I could find was in other languages, foreign languages. So I was in German or again, the Eastern European languages, Russian, most commonly. So he translated all these studies basically for his PhD.

In addition, he was recruited by the Czech, the government of the Czech Republic to be a consultant for them, to help them advise, about approving PMF therapies in the Czech Republic, primarily for rehab purposes.

So that's what he was doing, mostly rehabilitation medicine. And in the end, he provided me his, translated, review. Oh, great. So we worked together and produced a book called Power Tool, Magnetic Field Therapy for Eastern Europe.

How? Magnetic fields. Basically work. And that was the research evidence over 30 years of science in Eastern Europe. Okay. Wow. I had the science, right.

The static magnets and the post magnetic fields. And that book that basically provided us a really solid foundation for me to understand what magnetic fields were doing.

I expanded my work with it and then bringing us up to date now, I published a book with him, and I'll I'll show you that in a second. Now, it's a fairly it's a fairly technical book that back a little bit.

There you go. Okay. Right. So, it's still available. You can get it through our office here. I did sell it for a while on Amazon. So anyway, this book has lots of citations and lots of evidence and talks about different uses and different clinical specialties.

Well, then I, I produced a website, put as much content on as I could. I acted as a basically consultant, an educational resource about magnetic field therapies.

And subsequent to that, then I continue to review the science myself and whatever I could find in addition to what I had, Doctor Jeremy also got access to, an abstract library of over 30,000 abstracts on the effects of VA maps and pamphlets on the body or biology in general.

So, okay, now we have some pretty solid science. But, you know, I was one person, I had all this knowledge and nobody else. But other than the experience people had in Europe.

So I kept working with magnetic Fields and then produced a website called com. And there's a lot of content on there, but the content on the website is limited.

Websites are limited in what you can say. It's almost like soundbites. You know, you have a small amount of information you can provide. So eventually I then I produced a book called, Power Tools for health.

How pulsed magnetic fields help you that in that book then I have about 500 references. Part of the problem clinicians face is that it's not. There is a journal called By Electromagnetics you're Allowed by electromagnetics.

But the problem with that journal is that it is, mostly, basic science, very little clinical science with it. So it doesn't help, you know, the clinician basically to to figure out what to do with magnetic therapy.

And, so we published the book Power Tools for health, provide 500 references to back up all the, actions I discussed. And in my work, my research, I discovered that magnetic fields basically have about 25 to 27 different physiologic actions in the body.

Now let's talk about some of those. And then also, if you will. And I know some people are thinking, I was thinking about it, that, there's electromagnetic fields and there's, you know, we talk about EMF being not good, being bathed in EMF, your cell phone, you know, your router, etc..

But then there's also EMF that are beneficial, pulsed emfs. And it's a reminder since it's about the frequency and the intensity.

Static Magnets vs Pulsed Electromagnetic Fields

So if you can get in a little bit about about that so that we're not the listeners not confused about, well I'm supposed to avoid them. But on the other hand they can be healing what's going on here.

Unfortunately the terminology is common between the two. So stands for pulsed electromagnetic fields. Right. And emfs are electromagnetic fields where the distinction right.

So unfortunately it shouldn't be pulsed. I it shouldn't be emfs. It probably shouldn't be. In fact, I even consider EMF in environmental magnetic fields okay.

As opposed to pulsed magnetic fields. The basic distinction between them is that emfs are essentially broadcast in the space. They're not directional.

They can be somewhat directional, but basically the broadcast in space. So that's considered an open loop system. Magnetic field just goes out into space, right?

Current producing a magnetic field is contained. It's closed. My thumb is the current. This is called the right hand rule. So the direction of the current flowing produces a perpendicular magnetic field to the direction of the current flow.

Okay. And with every pulse of the current, what you get is a magnetic field that opens and collapses. In other words it goes back to zero. It goes from zero out and then back to zero.

It's not broadcast. It's contained. How far does it go? And it has it depends on the intensity. The intensity primarily intensity and frequency to some extent.

So very, extremely low frequency magnetic fields, let's say under 100MHz, I would say under under a kilohertz have basically can go, quite a long distance.

But it's not a wavelength. It's a pulse. Right. That's why they're called PMS, pulsed magnetic fields. So because they're pulse magnetic fields, they're designed for therapeutic purposes.

It could be designed for other purposes as well, like in engineering and, and and equipment of different kinds, including in the medical environment. And I think the the lower frequency, I guess in intensity, this differs from the, the higher intensity, broadcast EMF and that those, those emfs, the latter can heat up tissue and cause damage and change gene function versus the.

That's the key, right? That's the key. So most of the frequencies that we're concerned about, most of the MPs we're concerned about are microwave frequencies, extremely short frequencies like our microwave ovens.

Right. We use that principle to heat food. Right, right. Because it absorbs the frequency. So these frequencies are absorbed by the body. They don't pass all the way through.

Whereas the pulse magnetic fields pass completes through the body. The body is completely transparent to a magnet to a pulsed magnetic field. And that's valuable because what it's doing that is, is not staying resident in the body.

It's not used up by the body. It doesn't matter whether you have clothing on or not, doesn't matter whether it's muscle or bone or a brain or a skull, it's going to go all the way through.

That's just the general principle about, EMF, and that's useful for us. EMF are designed for other purposes. They're designed for communication, right?

Right. They're not designed for therapy. So they may have incidental effects on the body, as you mentioned, DNA damage and heating and so on. That's where the risk comes in.

So for example, if you if you hold a cell phone to your ear, almost doesn't matter how long, but the longer that the more effect you're going to have, you'll see that the ear turns bright red.

Most people. So that ear is effectively getting cooked. Even if you're not touching these. I mean, obviously touching it would be a matter. Yeah. You can you can hold it like 2 or 3in away from your from your head.

But because it's close enough and the intensity is high enough, then that dose, that exposure dose is going to be it's going to create physiologic actions.

Now, emfs in general, most people are not exposed to EMF in high doses, except unless you're working on tower cell towers, you're actually on somebody working on a tower that you're going to be exposed very close to that field.

Now, all magnetic fields, like any other radiation, whether it's sunlight or sound or heat or cold, drops off extremely rapidly according to the inverse square law.

There are other laws that can be invoked as well. But I use the inverse square law and we use the inverse square law for radiation dose. Right. That's a classical used for inverse square law.

So all of these fields drop off very rapidly. And so you have to calculate the dose based on the distance that you're targeting. And pmfs are the same.

You should calculate the dose based on what you're targeting and what your intentions are. So p inverse basically are very very, very safe and much lower frequency, and much lower intensity as well as lower frequencies.

If you go under 100MHz, usually the heating effects are minimal, right. And most of most of the heating and course heating caused by P is actually due to increases in circulation locally.

So you get local local heat because you've improved circulation. So we're all familiar with MRI. Where do they fit in that. Brain MRI. There's two aspects to MRI radiofrequency fields and a huge static magnetic field.

So the radio frequency fields are can have a potential for harm. And there is some discussion about MRI having harmful effects. But you and I know hundreds of millions of people have been gotten MRIs, many, many MRIs with virtually no damage.

And the people who work in MRI environments are not report significant health issues. Right? Okay. So they're not therapeutic high frequency and static field.

So there was a study done in McLean hospital. They had reports of people who had their depression get better after an MRI. So based on that evidence, they conducted some research to look at the use of, magnetic fields for, the brain for MRI.

And, of course, now we know, from pmfs, and now we know that there are devices approved called Rtms or TMS, transcranial magnetic stimulation. Right. For for treatment resistant depression.

Right. And there are also, fields approved for called TTL. Basically for glioblastoma. And they're approved by the FDA for that purpose as well. So there are uses of those other kinds of fields to some extent.

But and there are magnetic field therapy devices that are approved by the FDA for, healing nonunion. Now we're using TMS for depression, which is still a, pulsed magnetic field, high intensity pulsed magnetic field.

And that's approved for for depression. There's also a feel approved for pain and wound healing. Okay. So we I think we have a good idea about what the range of electromagnetic fields are, from damaging to therapeutic and in between diagnostic.

Can you tell us, I'm really curious to know what is the mechanism for the therapeutic effect of these lower intensity. Lower frequency? I know there's something to do with the mitochondria in ATP.

Membrane ion channels. Let's let's talk about that. All right, so the primary, law of physics that governs the effects of magnetic fields on biology, particularly, is Faraday's law.

And Faraday's law says that as you increase your charge, as the charge increases, so magnetic field increases from zero, say, to 100, then that happens over time.

So Faraday's law says DB the change and be the intensity divided by the change in time gives you something called Tesla per second. That's the measure of the induced the likely induced field.

So the higher the DVD the greater the induction of charge in the body. So a pulse magnetic field passing through basically ions electrical charges of any kind, ionic charges of any kind will create charge will create more energy, in other words, or create more electrical charge in the tissue.

So the DDT of a magnetic field passes through the body is where the action is. It's the induced charge in the body. Now, if you apply a electrical charge to the body, that's called capacitive coupled electrical stimulation.

And that's limited by the body's ability to absorb that electrical stimulation. Let's call that controlled electrocution. Oh. Okay. Go deep into the body.

Right. It's very superficial. Whereas magnetic fields are inductively coupled.

How PMF Works in the Body

Electrical stimulation. So it's inducing charge in the body, right. It's coupling to the charges in the tissues that are there already, amplifying them significantly.

And that extra charge then is used by the body to produce all the physiologic actions of magnetic fields. So those actions in my book, the Power Tools Book I list 25.

And since then I've discovered a couple of more. So some of those actions include acupuncture. So that's how I got started on this journey in the first place, trying to find a solution for pain that was not conventional.

And acupuncture certainly does that. So magnetic fields clearly stimulate acupuncture points and meridians. Okay. And if you stimulate the whole body with a magnetic field, use a whole body magnetic field pad.

You're basically stimulating all the acupuncture points and meridians in the body simultaneously. So rather than having to be directed and, you know, ancient signs, ancient acupuncture, that's the tool they had.

So there was at one point at a time or multiple points at the same time. Well, fortunately with magnetic field therapy, because now we've actually discovered scientists discover that the acupuncture meridian system is a DC current system.

Oh, really? I did not know that. From a, engineering perspective, it's a lot less. There's no loss in that system, and each acupuncture point is basically a capacitor.

So it takes charge from the previous acupuncture point, builds the charge and sends it on to the next one. That's what happens in a DC current system.

So it's a DC current system. And because it's a DC current system it applies to Maxwell's equations and Faraday's law. So then basically you can amp up that system using magnetic field therapy.

And I measured that actually we did the same EMG studies looking at magnets. And the acupuncture point. And and we certainly found effects. Everybody thought about that.

In fact I teach a workshop to acupuncturist about why magnetic fields work on acupuncture and how to combine acupuncture and magnetic fields to get even better benefits.

Okay. So, so, so there is otherwise we know that acupuncture works and we've all had patients have beneficial effects on it, but there's now good science and physics around exactly why it works and how it works.

But you but you're saying like, sort of, electromagnetic mat. A field mat is almost better in some ways for general, therapy, for general therapy. So one of the, one of the actions, physiologic actions of the magnetic fields, then, is the acupuncture stimulation.

It's, stimulating the meridian system. And then you get all the derivative benefits of stimulating on an acupuncture system. Okay. So that's one of the key elements.

That was one of the first things I discovered in my own journey. Since then we've also discovered that magnetic fields have antibacterial, basically. Microbiology, microbiological benefits.

They have anticoagulant effects naturally, almost equivalent to, aspirin itself. Much safer than aspirin. They have an anti edema effect. If anti muscle relaxation effects they have an increased autophagy.

They improve autophagy. Not in a bad way but they improve autophagy. How they do that. I'm just wondering if that's been worked out. Probably because of the charge, partly because of all the different effects that it has on the cell membrane.

And so we talked about you mentioned, mitochondria function. So mitochondria function as a group. And we know research shows that magnetic fields increase ATP production by between 100 to 600%.

What, what so that's a lot surprised the tour de France guys aren't using it or or any I mean, are a lot of endurance athletes tapping into more and more and more.

It's hard to get through the trainers, as hard to get through the orthopedist to get to, to get to the athletes. But more and more athletes are discovering these benefits.

In fact, anecdotally, I had a guy who was number three in the world with, golf while driving, you know, long distance driving. How far could you hit the ball? Sure, sure.

He was number three in the world into his 40s, and he was using magnetic field therapy every single day. He would use it before competition, and he would use it right after competition.

Anecdotally, a friend of mine, an MD, worked with, American Olympic teams, and they would do tryouts, they do competition and so on. And he said, our guys and in this case, it was guys.

Our guys would take 2 to 3 days to recover from prelims or a competition. The Russians and the Eastern Europeans were back there next day like robots.

Well, yeah, Hank back up. But he couldn't figure out why. Why, what's going on here that they are doing that's different than what we are doing. He he walked past their camp.

They leg and magnetic tubes. And that's not doping. No, it's not the it probably will be at some point, maybe. I don't know for sure. I mean, that's a that's an interesting thing that WADA would have to, would have to deal with, to decide whether or not maybe I would hope that they wouldn't make it because it's helping people to recover.

But, it's it's physiologic. It's not a lot. Right? Right, right. Right, right. And it doesn't matter whether you use infrared or whether you use sound.

There's so many ways of stimulating the body. Physiologically, the emfs or pmfs are just another mechanism. It's a physical therapy mechanism, basically.

So we're talking about, recovery in athletics here. There is and I want to get back to that in a way in a second. But if you had to think about what the sort of the number one treatment, indication is for it, tell us what that is.

I mean, I'm kind of assuming it's, it's pain or or, for the, the nonunion kind of stuff. And then we'll get into sort of how to use it for preventative and anti-aging purposes.

But let's just talk about the that first. So if we I'm going to preempt you, if you don't mind a little bit, let's go back to the mechanisms okay. Because when you understand all the mechanisms then you can say, oh my goodness, what else can we do with this stuff?

Right. Okay. Right. So we talked about edema. I talked about muscle relaxation, autophagy ATP, circadian rhythm rebalancing, stimulating collagen, hyaluronic acid gags, detoxification, brainwave tuning.

Also, I want to talk about that for sure. Yeah I want to talk about that. Galloway stimulates growth factors. Nitric oxide tissue regeneration stimulates stem cells, balances immune function, stimulates nerves and nerve conductivity.

It goes up and down. Oxygenation improves oxygenation significantly. Transmembrane oxygen transfer in the lungs. And then and then the release of the oxygen in the tissues and enhanced by pumps.

And how does that happen that they've been I'm curious about how that happens physiologically. Well, first of all, if the cell membrane is we open up.

If we open, membrane channels, ATPase, sodium potassium ATPase, calcium, magnesium movement across cell membranes in injured cells that stops. It doesn't work. It's dysfunctional.

So magnetic field therapy seems to open the membranes and allows those processes to, reactivate. So it's basically rebalancing the internal cellular environment with the external environment, and you get better, electro, magnetic, movement in the tissues that then allows oxygen transfer.

So mass effect oxygen, capacity carrying capacity of, hemoglobin. Oh, really? Just like being an altitude sort of, to some extent, yes. Whenever the altitude happens to be, so basically when you're then, transferring oxygen from the lung from the alveoli, past the membrane, if you're opening these channels, you're then increasing the ability of the oxygen to transfer.

And then because of the effects that it has on the, red cell membrane itself, that you get better oxygenation of the red cell. And there was this red.

Once the Red Sox get into the capillaries, into these smaller spaces, they release the oxygen better. And once it released, it's released better. Then obviously you have more energy for the cells as well.

So oxygenation is one of the key principles. I actually did a postdoc study in an acupuncture practice, looking at, paying patients in an acupuncture practice and doing, pulse access before and after magnetic field therapy.

And we had a statistically significant increase in pretty well. Now, you're not talking about going from 67% CO2, up

to 97%. We're talking about, you know, again, 1 or 2%, 1 or 2% is still pretty significant.

Interesting. Yeah. So okay, so we understand the mechanism. The it's used clinically for which okay. So if you think all those different mechanisms, it really doesn't matter what you use it for.

All disease has most of these mechanisms in common and the probably the most common in common. The final common pathway is probably cell injury. An injured cell has a series of events that happen in that cell.

And those that cell then has to adapt to that imbalance. So the, you know the dysfunction that's dysfunctional change and that's dysfunctional change slips down that slope of dysfunction until finally it reaches a point of irreversible injury.

So if you're targeting the cell, let's say on a regular basis, cells on a regular basis, you're able to restore those functions.

Clinical Uses for Pain, Injury, and Recovery

Membranes stabilization, ATP production, genetic stability, providing more nutrition to the cell because of the improved membrane transport, getting detoxification, getting rid of waste out of the cells better so all of these things begin to happen.

So it doesn't really matter what the condition is. We put a label on the condition but what are the physiology. So when I look at a problem somebody says I got this problem.

I had never heard of it. So I go looking up, what is the passive physiology of the problem? Who has any of these mechanisms in play in that problem. Then magnetic field theory is going to help to at least some extent.

But what drives people to seek magnetic field therapy. Not just. Oh okay. Well pain I mean it's the discomfort right. So pain is the biggest driver. People are going to spend more money to deal with pain than almost anything else.

Right. And it's the most common that you have a hundred million people in the US with chronic pain. That's probably one of the most common problems that we deal with for sure.

Yeah, right. So pain is probably the most commonly used. That doesn't mean it's the best, or that doesn't mean that it should be the only one. But again, if we understand mechanism, then we can understand application.

So for diabetic neuropathy is it help with even things like degenerative disease and spinal stenosis and, and that sort of thing. Yeah. So again, going back to mechanism.

So with spinal stenosis the cause is either going to be a disc, usually disc or arthritis. Right now you're not changing the arthritis and you're not changing the disc.

Those are mechanical right. And magnetic field therapy doesn't fix a mechanical problem. If you're if your arm is hanging off your shoulder by a thread, then you got a sore back. It's right. Right.

So what we do then is we're decreasing mechanisms again the inflammation irritability of the nerves in the tissues. Then they cause problems with function.

So if you can reduce the swelling and magnetic field therapy has a natural anti nociceptive effect. Oh that's been proven. So pain reduction by itself without any other mechanism also happens with PMF.

So one of the first things I tend to say with people with pain is the pain goes away. But I know that's not a solution, right? It's making the pain better.

But what we want to do is to deal with it, cause we want to be able to reverse the problem. If we can't. And so with

the back pain response analysis, we reduce the edema.

You reduce the irritability of the nerve. So you add interception, you reduce the DMI, reduce the pressure on the nerve from the edema. And then hopefully if you continue to do the therapy over time, you may be able to stop the progression of the arthritic process.

And then in terms of discs, you may be able to hydrate the disc better because the disc is hydrated passively. Right. There's no blood vessels going into it, right?

Sure. Just by osmosis. But if you increase the blood supply around a disc, because often with a disc problem you also have muscle spasm, reflex muscle spasm.

So that tends to aggravate the problem. Compression makes it worse, right? To relax the muscles, increase oxygenation, increase hydration, and then maybe longer term you're going to get a, stability of that, this problem.

So you're working at multiple levels basically with the magnetic field therapy. And with that B for sort of a back issue. You know, I'm thinking about myself because I got a little spinal stenosis.

That would that be lying on, on a pad then, or would it be more directed? It depends on what your, what you have and what you buy. So I happen to be, my philosophy is if you're going to get a magnetic system anyway, if you're going to make that an investment and you get a proper magnetic system, you should be doing health maintenance anyway, right?

Right. Good. Because the biggest investment is the control you the applicators are less expensive. So get a good control unit and then add whatever applicators you want.

So yes, whether it's whole body or local, in the case of, if somebody wants to limit how much they spend, they say five and you need a high intensity local, applicator you could treat locally and you're going to get better results faster, typically with higher intensity.

And we can get into that in a second with, inflammation because PMF stimulate. This is one of the new mechanisms I found since I wrote the book. It's the adenosine receptor.

The magnetic therapy addresses the adenosine receptor, and you need, about 15 gauss optimally at the adenosine receptor to decrease inflammation. Oh, studies were done on adenosine receptors, on neutrophils.

So where's the inflammation. Right. Yeah. It's coming from neutrophils. Yeah. Sure. Everywhere anywhere in the body. Right. So if you get the right magnetic field intensity to address the neutrophil wherever you have inflammation in the body you're decreasing the inflammation through at least through the adenosine receptor.

Mechanism. Well it sounds like virtually anytime you have trauma or wounding. And that would be, you know, from an accident or from diabetic ulcer or something like that, or even post surgically, PMF should be used.

Absolutely. I mean, is it I'll give you another anecdote. Yeah. Case study. So myself, I had an elective appendectomy. I had a small fatty tumor at the entrance to my appendix during my, routine colonoscopy.

So we decided that we we had to find out what it was. They couldn't just snip it out. You had to remove the appendix. So I had an appendectomy as elective.

Had it done on Friday midday, I was back to work on Monday. Laparoscopically it was done. But you had that macroscopically quick healing because you were using it on my stab wounds, right?

Okay. So then that, also then begs the question, you mentioned collagen gags. Esthetic use of it for, like, for facial rejuvenation or wrinkles or you can, I mean, theoretically, you may have to again, you pay a lot of money for a piece of equipment, maybe a lot for Botox, too.

So I think you get oh, this is true. And it doesn't last. Right. And fillers. So, I'm curious about to what extent you have collagen, increase. And, you know, the glycans, amino glycans increases.

I mean, other studies that look at, yes. Have devices in the Power Tools for health book. There is actually a, a section. Let's find my spec, my spot.

There you go. Right there. Good. There's actually a section in there on, collagen and gags and hyaluronic acid so you can get somewhere between 25 to 30% increase in college and production.

That's a lot. That's a lot. And what, over what time period? Well, again, the treatments typically and most research studies, the treatments are like 15 minutes to half an hour and then you repeat periodically.

So, probably over 2 to 3 weeks. Really. That's pretty impressive. Okay. Well, that I mean, I know we have people that practice esthetic medicine, medicine, listening.

And so I wonder, you know, whether that's an area that they could enhance, enhance their practices as well with, with, with one of those devices is, I think, certainly more physiologic and less invasive and, you know, other things hopefully, if it works, you know, 25% is a pretty big increase in college.

And so that'll be interesting to see, you know, people that are using it in a study in esthetic practices. Yes. There's you know, there are biases. We all have biases. Right.

Also depends on who's been sold, what by whom. Right, right. The in the esthetics world, they tend to be a lot more high frequency oriented. Right. Yeah, sure.

The lasers etc.. Exactly. And even even light therapies. So the more mobile and useful it is, the faster it gets the results. So some technology will produce results better and faster for certain problems and others.

So, the answer is yes. Those doctors who are willing to do this. But I find that magnetic field therapy is much better, the kind that I recommend and use is much better in orthopedic applications.

Okay. And post-operative applications that it is dermatologic. Okay. Because you need you need very rapid results, right. Short treatment times, very rapid results.

But if you're a home user, you have the time and the luxury to do it on yourself at home. So you know, soon the whole body therapy anyway, right. You're getting that benefit anyway. Okay, okay.

We'll take it. Good. So, you mentioned, TMS and, and and I read on your website, this idea of in training brainwaves, you get the same frequency in the, in the EMF, the pulsed EMF, and you can get potentially a beta for higher concentration.

Can you pulse it at an alpha for the same calm inducing that you get with meditation or neurofeedback? Absolutely. There are plenty of devices being marketed now that do that kind of work.

And I was I did audio visual entrainment years ago, decades ago. And that's how I got these concepts. And then I had some additional training in the past 3 or 4 years in neuroscience using, basically, entrainment processes for it's called, well, neurofeedback essentially.

Right. Yeah. So with the brain frequencies now become more important. Most of the time my emphasis has been on intensity, particularly if we think about the adenosine receptor or the optimum magnetic field intensity is about 15 gauss.

Then you have to, you know, calculate the mega dose that you need at the tissue that you're targeting for inflammation. So for the kidneys or the lungs or the heart or lower back.

So for for up for these kinds of purposes, for entrainment purposes, you don't necessarily need a stronger magnetic field. But we have designed a device called the flex pulse.

So I was involved in the design of that with a company in in Germany. And so we have individual frequency. So we'll have delta which I use for sleep. And when I'm running I'm flying across the country, I fly Delta.

I do a magnetic therapy machine across my, my head or the base of my spine over the rest and I yeah, I'm okay. Very good. So you can go ahead so that so then you can design frequencies for the delta.

You can do theta for meditation. You can do, alpha for relaxation. You can use beta for alertness. I again I case in point, I have to pick up my daughter at the airport in Baltimore about 2:00 in the morning.

I normally go to bed at ten, and I knew I was gonna have a problem. If I drank coffee, I'd be up all night. So I did magnetic entrainment using beta over the rest.

Small desk over the back of the head. And I was wide awake. Got to the airport, pick my daughter up. I didn't have hangover. I didn't have a buzz. You know, I was just alert.

I got home, took her off my right to sleep. Nice. That's very interesting. It's increasing the amount of frequencies in the brain that are now oscillating at the, beta level.

That doesn't mean the whole brain is oscillating at beta, but enough energy, enough oscillation is happening that now consciousness shifts into that level of our awareness.

So you can tune the brain to those specific frequencies. And the flex pulse does that. It's called the flex pulse. And it's it's a portable device to be to be battery operated.

Yeah. Oh very very interesting. So we've been having a really good conversation. And you know, anything in terms of healing is, is is obviously of interest to our listeners.

But you also did mention that there are a few studies, looking at the effect of MMF on telomeres or telomerase. And I also but I would think then through that, on senescent cells, which could potentially help with many conditions of aging.

Can you talk a little bit about that? So I could only find two studies that specifically looked at telomerase. And one of them was done in leukemia cells.

And what they did is they looked at the use of DMSO to stimulate this, the cells, the red cells, and found that the DMSO cost between 100, cause 100 fold increase in telomerase activity versus how.

DMSO caused a hundred fold increase in telomerase activity. Well, that's pretty wild. On red cells obviously in culture, right? Right. Now what happens in the body it you know.

Yeah. Yeah, sure. And of course the dosing of the DMSO, it's on which you can do more in vitro than you can in vivo. What they found is that the PMF activity and I have to read here, exposure to 1000 to 10 gauss magnetic field reduced that, increase in telomerase activity.

I'm sorry. It's a decrease 100 fold decrease in telomerase, right. It's not what we want to see. Right. Well, in a cancer cell, yes. It isn't what you want to see but not in a healthy cell.

So interesting. So in a leukemia cell model they found a 100 fold decrease in telomerase in fat versus sham exposed.

Brain Entrainment and Mood Applications

Now with regard feel therapy ten Gauss. That field reduced that in the decrease in telomerase by ten fold from 100 fold to ten fold. So in a sense, it has a protective effect against the supposed negative effects on telomerase in the leukemia model.

Yeah. I mean, that's a you want the opposite to happen in cancer. And telomerase is consistently, activated in in in cancer cells. I mean, I would think that, just from the stress reduction, and other beneficial effects were reduction in pain that over time you would see, either a slowing of telomere attrition, just as, you know, stress reduction, meditation, all those things help.

Those studies just probably haven't been done. But that would be interesting to see. So from a standpoint of practical, there was another study to, and X-ray exposed ovarian cells.

So these ovarian cells were exposed to ten get gray units of X-rays. And they increased telomerase activity by 2.6 fold. So x rays increased telomerase activity by 2.6 fold.

Okay. All right. And then so that's that's a negative action. And we know that right. X-rays cause radiation damage. Right. So it's that's interesting. Go ahead.

All right. So then they magnetic fields were applied as a control. And they marginally decreased. That's one reason barely barely touched the telomerase.

Production initiated by x ray. So that I wish it would be more. But then again, in this case it's not a negative effect. In other words, it didn't decrease the telomerase activity to a point where the radiation would be even worse.

Right. Yeah. I mean I'd be curious. Take a closer look at those studies. So they're on your web. You're on the website or in down and go. Not okay. Oh I'll take a look for some unusual places.

I'll have to show you. I'll send you the abstracts directly. That'd be great. That'd be great. So from a, from a practical standpoint, in terms of implementing PMF in a longevity practice or an age management practice or in your own personal life, what kinds of recommendations is talking about daily exposure to PMF?

And then of course, localized for particular treatments, higher intensity, etc.. But, but it sounds like that's what you're recommending. And then perhaps the flex pulse for sort of specifically, brain and mood, stuff.

All right. So let me think about the things that tend to shorten telomeres. Okay. Yeah. Right. Oh bad habits, shortened telomeres. There you go. So stress, obesity.

Basically, sedentary lifestyle. Yeah. Then dairy lifestyle pmfs increase stem cell production by about 65%. Wow. That's a lot between 35 to 65%. And most stem cell lines.

So we're talking talk about mesenchymal stem cells which are the most common stem cells. Right. Then their their production is increased and their differentiation is is improved.

So PMF therapy act on the entire basically the entire stem cell process. They increase production. They improve differentiation. They increase survival.

Right. And they increase the longevity of the cells that were that were produced. So perhaps act on the whole stem cell process from beginning to end.

And I'll give you an example. Clinical example I had a three year old child that children, three year olds have a lot more stem cells that 70 year olds.

Right? Right. Yep. Huge huge difference. So this girl, this little girl cut off the end of her thumb in a doorjamb, a vast it. And the father contacted me right after that happened.

He had a mate. He had a small, portable magnetic therapy device that he purchased from us. Yeah. What do I do with this? So. Well, my recommendation is that have a surgeon reattach it.

That's good. Good advice. Right. Have a surgeon reattach it because, you know, if it doesn't work, you're back to where you were anyway, right? Sure. Right.

So they reattached it. Now I have pictures in my book where you can see the suture marks. It clearly is black because the blood supply was disrupted completely.

So she did an hour and a half to three hours a day of this magnetic field directly on the thumb. 12 weeks later, she's regrowing her nail. Wow. And so it was the nail that came off. Not the whole thumb.

The whole thumb hop. So her that's the joint. And so the nail growth. And she had full function and everything. Yes. Wow. Yeah. Well, you know, we maybe there's some processes being induced to similar to, you know, sort of the, the tadpole that can grow the tail back, kind of thing where and it not likely involves telomerase, activity in stem cells, stem cells, telomerase stem cells and telomerase go together.

Right? Of course, most most stem cell activation involves telomerase. Absolutely. That's why stem cells are different. They have more more telomerase activity and continue to replenish degenerated tissues with it.

Telomerase is turned down as a supposed tumor suppressing tumor suppressor mechanism in younger people. So they don't come from cancer. But later in life, that is, a deleterious effect of it because we we're living longer.

We need that regenerative capacity. So so that does kind of pull it all together there. I think, what's your thoughts about the future of EMF and how, how it how it's growing?

I mean, you're obviously doing lots of work to try to get the word out there. Well, but let's go back to your previous question. I interrupted you again. Sorry, with the finger example.

So how would you use it? The thing is, most people tend to want to make the investment because they got a problem. They're dealing with. And most of the people that I work with and I do consultations, so anybody wants advice or specific advice on their particular situation clinically that I will we'll do have our consultation and then provide you, advice on the best system for you to have for your problem consultation process.

Rarely is that one problem. Mostly it's, you know, multiple problems. So whole body systems are a are the best because again, you're doing prevention.

The biggest investment is the control unit. And then you have a whole body system. And you can have a smaller applicator that you can apply to different parts of the body separately.

Okay. Right. So you make the an adequate investment. And then it's a question of how much do you use it. And there's no good answer for that. So I tell you I can't look at your body.

I don't I don't see what's going on at the cellular level.

Telomeres, Stem Cells, and Longevity

So if you but if you have, but what is the 100 trillion cells in our bodies? And every cell has about, 2000 biochemical processes per second. Yep. How much should you be using it?

Right, exactly. But what do you find in your, you know, years of experience? Is effective. I mean, 15 minutes lying on it. No. Know. There are there are companies that are selling magnetic therapy devices that are one dose or less.

So anybody buying up my system, but they don't know what the intensity of that system is, don't buy it. Right?

Okay. They're not willing to tell you what it is.

Then don't buy it. Yeah, right. So always ask what's the intensity because the intensity drives the inflammation. We talked about the adenosine receptor.

You need 15 gauss optimal right. So if the system is delivering only one gauss it doesn't matter how much you use it. Right. Not going to do it's not going to do much.

It'll still help. It still make you feel good because it stimulated the acupuncture points. Right? I'm not going not going to do much healing time is a problem for everybody. Yep.

So I think the more motivated you are, the more time you have available, the more time you're going to need. So, typically the answer is effective for pain.

If you're doing the treatment and the pain comes back an hour later, then retreat. Now maybe it is only 5 minutes or 10 minutes, but if you did an hour treatment and the pain took eight hours to come back, that's probably better than a 15 minute treatment.

So physiologically, people are going to have to find out for themselves how much time they really need to get the best results. Okay, my usual recommendation, even for health maintenance, is a half an hour twice a day.

Oh, okay. So, that's a substantial time commitment. I guess you can be doing other things, meditating, whatever, at the same time. You can meditate. It's hard.

You can read, with a smaller applicator to your back. You can still work out and do whatever. Right? Yeah. So, but this is the point you have people have to decide for themselves what benefit they want, right?

Considering the investment they're made. If you can get by with eight, 8 or 10 minutes a day frame, what happens is at the beginning, you're going to need more time to get everything tuned up.

Get everything they can optimize optimize. And after that you all you need to do is to maintain. And if you back off your maintenance level, you back off your therapeutic level back to maintenance and the problems reoccur, then you haven't done the job yet.

You haven't healed the tissue. Okay. So everybody's got to find out for themselves how much time they're really going to need. And I'm sure like we, our listeners and viewers can go to your website to get more deals.

But just generally, what are we talking about for a good system cost wise, what would be the range. So because intensity matters. Yep. So what are some of the one Gauss magnetic systems that people are being sold in?

Multi-level marketing programs are about 5000 to $6000. Oh, wow. Okay, okay. That flexbox device I mentioned to you is about $1,000. Okay. Right. So that but that's a small local device.

If you want a whole body device, it's going to give you enough intensity to help you deep in your body with healing purposes. You're going to be talking minimal, three $3,500.

Probably closer to 6000. Okay. And it's a pad you lie on. Basically, yes, it's a pad you lie on, it's got a small control unit, and then you plug it applicator in and you lay on the pad, and then you can unplug that applicator, put on a small one to trigger spinal stenosis or whatever else.

Okay. That's what you should expect to invest. Again it's an investment. You're right. And it's going to be an investment in time as well. But you know we when we are dealing with anti-aging, what do we want.

What we need to do to we want to live longer healthier. Yeah, absolutely. So I mean that's not a crazy investment. You're sort of along the lines of, of other types of things, you know, some of the, you know, portable sauna type

things or the, you know, infrared devices, etc., or portable spot.

Yeah. Or portable light systems. You can spend 3000, $4,000 for those cure. And the problem with those is they don't penetrate the body deep enough. So you feel like if you're doing the EMF, you don't necessarily need to do the light therapy for photo bio modulation.

They come by, but everybody's got issues with resources and time, right. So I found over 30 years of doing this and having used all these other devices as well, magnetic field therapy is the best value because it reaches complete through the body.

Okay. Right. Most of these other systems are limited. They're very shallow. Yeah. They don't go, you know, that deep, right. Looking for skin. Fine. But otherwise. Yeah.

For the brain, for example, you're going to need 4000 guns to go from one side of the head to the other 4000. Wow. That was. Yes. And deliver your 15 gauss optimal intensity.

Right. Oh I see. Oh. Okay. So and they're devices that do that. Yes. The devices, the ones that I mentioned, especially at the $6,000 level, are going to do that.

Great. A little thing just popped into my head before we end and you tell me whether this is silly or not, but, with all the advent of the electric cars, is there going to be an issue with PMF people driving around in these electrical vehicles?

And that PBM f f f mf I'm going back to the original discussion about EMF in general. Even radial tires produce an EMF, all right, because they have some metal in them and they're spinning.

They're bending and changing. Now, people have done measurements on the EMF produced by a battery in a electric vehicle. And it's it's very small. Okay.

If you're going to be driving long distances, if you're if you're doing a community drive 15 minutes, a half an hour, it's not a big enough dose because the dose is relatively small and the time exposure is relatively small.

Your body, like any stimulus, like a cloud passing over the light or, you know, the light shining through a cloud system that that minimal exposure is going to stimulate the body to some extent.

But the body will recover. So, for example, healthy person, when they did, we did brachial artery studies on, with magnetic fields and looked at the, vaso dilatation of a brachial artery and again, healthy people.

And what they found is that the artery dilated probably within a, microsecond, dilated just as rapidly after the stimulus ended. It vessel constricted for about the same amount of time and then went back to normal.

Practical Use, Device Selection, and Consultation

Oh, okay. So all of these EMF exposures create a physiologic response, and then the body has to be able to recalibrate itself. That's homeostasis right. So it's going to change the body says I don't want to be dilated I want to be this.

So it compensates cybernetically compensates go back in the opposite direction. And that goes back at the neutrality. So all of these kinds of exposures, if they're not very high and over extended periods of time, most of the time physiologic responses are going to rebalance.

Cellphone use, Wi-Fi use, cell phone towers, all of that are small doses for most of us. Most of the time over a long period of time. Right. And when you're doing magnetic field therapy with good magnetic fields, you're constantly rebalancing the body.

You're stimulating the body's natural systems to rebalance themselves so you can, to a great extent, undo the physiologic imbalances you're getting with the wrong kinds of magnetic fields, because sounds like something we all should be doing, on a regular basis to, to rebalance that.

Absolutely. Because, you know, again, there's no minute in a day that you don't have to rebalance. Yeah, for sure. Well, this has been a really fascinating and comprehensive discussion.

Opened my eyes up about the role of PMF in health and disease. I really appreciate you taking the time to talk to us. Doctor Pollack, it's doctor Polycom. Dr.

Lou kgw.com, I call, which is? I looked at the website. Fantastic information on there. And you can get consultations as well if you want to put your book up.

The latest book up for them to take a quick look at as well, so readers can get that. And we're going to provide your listeners in your show notes. We give you some links.

One is to, get the the list of 80 conditions that we have in the Supercharge Your Health book. Great. And number number two, if you want to order the book, you can order it through that link.

That will provide room. And number three if you want a consultation. So if you're not serious about your health, I'm not going to spend half an hour trying to convince somebody to buy a $5 system.

Right? Right. Or you have to make an investment in your health. So if you really want to make an investment in your health, then we will provide you a free consultation.

Great, fantastic. Well, I may well be giving you a call. But you don't have to. If you want to call, we'll we'll have a call offline. All right. Very good.

Thank you again. Pleasure speaking with you. Likewise. Thank you. All the best at your summit. Thank you.