The Science of Cutting-Edge PEMF Devices: What Makes Parmeds Different? Transcript

(Transcripts are generated by AI and may contain errors)

Introduction and Guest Background

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It possibly did a good job for wellness, superficial treatment. It does have some advantages for capillaries, for blood treatment, but getting through into the body, deep into the body, that's not That's not possible.

So when I looked into the available documentation studies because on the market, I saw an article about two Japanese scientists and a day long ago in the fifties, they discovered a piezoelectric effect of bone.

This is Doctor Talks, real talk from real doctors on the issues that matter to you most. Today's episode was previously recorded on the Pain Solutions Summit that I hosted.

Today I'm interviewing Ben Phillipson, who is the owner of the Curatronic system of devices. So I'd like to ask Ben by himself, his background, his education, and start with that.

Okay. Well, I'm a Dutch guy and I lived half my life in Amsterdam in Holland. I attended a various schools including studying electronics and specializing in medical electronics because I was very much attracted to the medical side of applications and advantages which being made in those times in the medical field.

I was technical director for a company in the Netherlands selling heart monitoring systems, physiotherapy equipment, And in my function over there, we got very often asked by medical doctors and cardiologists what to advise to use in the hospitals.

So at that time, we were selling a monitoring system, a nurse station manufactured in Germany. And new developments had to be interpreted on those devices, which was not always possible.

because well, there is a big, a large manufacturing company behind you. So then less flexible than if you do some interpretation yourself. So what we did, what I did actually was adapting a cardiac monitor system with special alignment system, second traces, memory systems, all electronics, mainly analog electronics and partly digital electronics to these existing devices.

I designed a battery backup systems for a mains powered defibrillators. We improved possibilities or I improved possibilities for failsafe use and nurse proof devices applied in hospitals.

At the same time, we were actually promoting physical therapy devices, shortwave, microwave, all kinds of stimulators. This brought us also to an alternative field.

I developed a full range of electro-arquipulture equipment, including for anesthesia, point detectors, diagnosis, treatment systems, and laser systems.

I was the first who developed a helium-ion laser system for wrinkle treatments. I know there is still one in use in Belgium still today, and because they asked me some advice not too long ago, and I developed a full range of electromyography biofeedback devices.

I hooked up the first, one of the first EMG devices to an Apple II Plus computer when it came to the market, showing on the screen to the users, their performance, using it also for children to activate an electrical train for

instances they were able to cross a certain amount of EMG signal.

I developed a temperature monitoring system for biofeedback, a GSR response system for biofeedback, a whole bunch of devices. But at a certain moment I said, listen, that's very nice.

And I had a nice job and I was due to take over the company. But you know, I'm Jewish and my family suffered during the Holocaust. A major part of my family didn't come back out of the camps.

And luckily my parents survived, also the father of my wife. So we decided we go to Israel. And that's what we did. We moved in the end of 1983 to Israel.

but not after having been introduced before, a couple of years before, to a German scientist by the name of Dr. Manfred Fieschner, who actually was one of the earliest, maybe the earliest developer of close electromagnetic field therapy system, which was called in German, Magnetfeldtherapiegerät.

You understand some German, so. You understand the word. So he came to the market. He was looking for a, he was selling in Germany, but it wasn't simple because in the same time period, electro-agriculture, homeopathy, all these kinds of things were coming up.

So bringing something new was not so simple, but anyhow. What year was that?

Why Low-Intensity PEMF Was Not Enough

I beg your pardon? What year was that? That's all right. The end of the seventies, I think 78, 79, something like that. So I visited his office in Germany and saw the equipment and I saw what he was doing was actually very interesting.

So he came to Holland and we did a tour together and we introduced the technology to the pueroparts and also medical doctors. Quite interesting, but the problem was there was a lot of competition, as I mentioned before already, in other fields, alternative treatment fields.

So after three years of sunshine, after we sought quite a few systems, it was economically not attractive anymore to continue working with that. And we dropped it out of our program, actually.

Now, the interesting thing is that when I came to Israel, I started working for a company in monitoring system, hard monitoring system, traveling a lot.

I also worked for the largest school system here in Israel in the laboratory for development for students so they could practice their theoretical what they learned at school by building electronic devices.

Anyhow, I ended up at the company selling capital equipment, lithotriptis and thermal therapy system for prostate treatment. I did that for almost 10 years, but before I left that company.

I traveled a lot in Eastern Europe. I opened the market in Eastern, in Russia, actually. It was very interesting times. During my travels and a lot in Germany, I saw a renewed interest in application of magnetic fields, specifically in the field of osteoporosis treatment.

So I did some follow-up and I said, if this is coming up again, well, we should definitely look into that. So I went to my boss, the owner of the company, the initial of them.

And I proposed, listen, we can do something similar, but we can do better. And I went to one of the exhibitions in Germany. I saw one of those low intensity devices.

And I said, that's not the way to go. We developed a system. We started selling it. And oddly enough, the first systems were sold in China, where there was an enormous interest in this.

We also added the diagnosis system for osteoporosis and x-ray based peripheral measurement system. And then I went to China and I trained the doctors over there how to use the system.

And then also we got interest from the Russian space agency. Those cosmonauts who were returning from the Mir station after so many years, they lost a lot of bone density.

So one of the devices ended up in the treatment center for those cosmonauts. It's also interesting. Anyhow, to cut a very long short, very long story short, I said to my boss, listen, I want to go independently and I'm going to leave the company.

He didn't want to let me go, but I said, yeah, that's, that's my, my calling. So then in 1998, I started my, actually the preparations for developing my own devices.

And it took almost two years to design the very first curatron climate device, introduced it in the market, started my own company in year 2000, and actually started selling the device.

So I was very, very early in the market, in the home market and in the low cost professional market for MDs, for instance, like yourselves. And there's a history, as they say, it slowly grew, And nowadays, I think we are possibly one of the leading companies in the field of PMF devices in the world.

We have devices in almost 100 countries around the world in five continents. We are the only company who are manufacturing both oscillating through PMF systems and impulse high intensity PMF systems.

And more or less covering the whole range of possible applications, what you expect from a PMF devices, including your own ideas with neuro programs recently integrated according to your request in the one of the devices.

And it's fun to tell you the truth. It's, it's nice to be able to help other people. to find this technology. I mainly concentrate on R&D and backing up of a distributor like yourself.

You do a fantastic educational job, I think. And I'm not the only one thinking this. And enabling you to advise your potential customers which system is probably best for their applications.

And happily enough, our devices are one of the devices, several of the devices you are promoting. So this is my background. Are you tired of living with chronic pain?

Medication only masks the symptoms, but real healing starts at the cellular level. I'm Dr. William Pollack, the leading expert on PMF therapy. Pulsed electromagnetic field therapy is a science-backed, drug-free solution that helps reduce pain, speed up recovery, and improve overall health, right from the comfort of your home.

Take advantage of an exclusive 10% discount on DrPawlik.com PEMF Systems. Visit DrPawlik.com, that's D-R-P-A-W-L-U-K.com, to register and claim your savings.

This limited time offer is available only to registered listeners. Don't miss your chance to experience the benefits. Terms and conditions do apply. Don't just manage pain.

Transform your health. Visit DrPauloth.com today and let's get started on your healing journey together. All right. Well, let's go back. Thank you for that.

Let's go back and talk about most your transition from let's say lower intensity systems and Compared to the devices that you probably saw in Germany at the time, most of those are probably very low intensity systems.

So let's arbitrarily, let's say that low intensity systems are, let's say under 200 micro Tesla, 300 micro Tesla. In other words, they're below two Gauss or three Gauss.

So your system, one of the lowest intensity ones that we have from your development, actually on the whole body pad is about 70 Gauss. So that's already almost 70 times stronger than many of the other legacy low intensity PNF systems in Europe.

So why did you go up from that low intensity level, very low intensity level, to the intensity level that you have? I didn't go up. I simply didn't believe that it could work really well.

Gut feelings. The truth of the matter is, I said, when I looked into the possibilities and into what was on the market at that moment, I didn't believe that those very low intensity devices could do a good job.

It possibly did a good job for wellness, superficial treatment. It does have some advantages for capillaries, for blood treatment, but getting through into the body, deep into the body, that's not possible.

When I looked into the available documentation studies that was on the market, I saw an article about two Japanese scientists, and a day long ago, in the 50s, they discovered a piezoelectric effect of bone.

There are electric fields and there are magnetic fields. Electric fields are produced by a voltage, and a voltage exists when there is an electrical cable connected somewhere, but it's not carrying any current inside the cable.

And the electrical field can be measured by the volts per meter, that's the distance over from the cable. Now, then you switch on the lamp.

How Magnetic Fields Penetrate the Body

actually then the electrons are starting going through the cable towards the lamp and then around the cable there is an electromagnetic field which is measured in gauss or in tesla and that's that's actually what we are talking about about magnetic fields right now going to the next slide I was talking about the two Japanese scientists and they discovered when they took a piece of bone and they put it somewhere fixed it at one side and put a weight on it and the other side and they started moving it by one centimeter that's almost let's say a third of an inch and then they could measure on both sides a plus minus sign an electrical excitation voltage of one and a half millivolts And this was in sync with the movement of the weight on the other side of the bone.

And they said, okay, right. We have here a piezoelectric effect of the movement of the bone. If you compare this, for instance, with your alarm clock, your alarm clock when it does beep, beep, beep, how does it beep, beep, beep?

There's a crystalline sign and the crystalline sign is agitated by an electrical pulsating current. Now then it starts a very tiny movement of the picture electric element itself which gives the movement into the free air and that is being translated into sound and that's the basis of how you hear your alarm clock in the morning when it goes off because you have set your alarm at a certain time and at that certain time an electrical pulsating current is being applied to both sides of the piezoelectric element.

Now, you can do the other way around as well. You can say, listen, if I apply a electromagnetic induction into a certain element, I will create in the element or in bone in the body, I will create a very, very small, tiny electrical current going through bones, going through cells.

So what you actually obtain, what you get is microcurrents inducted or created inside the body of a human being because of induction of pulsing electromagnetic fields.

Which I think is called Faraday's law, Faraday's law of induction, right? Right. Now, if for instance, if you have a coil, this is a flat coil on this, you can see when I move my mouse there, right?

Yes. Okay. Now, this is the coil. You see the electromagnetic force go out within the coil. And here, you see it spreads out, and it closes again in the same coil, this electromagnetic field.

Now, this electromagnetic field extends beyond, of course, beyond the coil itself. And it spreads out into the air. Now, I will get back to this in a moment.

Because some people say, all right, the electric, the magnetic field is actually attached to a coil and a like a bubble of a of a soap bubble, you say, which is in my eye, in my opinion, is nonsense because, of course, there is a field around it, but it's not attached to the field.

It's going through the rim, through the coil itself, and it spreads out much more than inside this bubble. but it decreases in intensity, of course, when you get away from it.

Now, this slide shows you here is a corn, for instance. Now, the most intense field is the darkest color, is the red color. But this doesn't mean that when you get away from the corn and the color gets lighter, you still have an electromagnetic field.

It's less in intensity, but the electromagnetic field exists over there. So you should not limit yourself only where the coil itself is, but also around the coil itself.

Now, and this brings us to what actually happens in the electromagnetic field. The white lines are an electromagnetic field going through a free space over here.

It's called magnetic permeability, the possibility of the magnetic field going through the space itself and creates inside an internal field. Now, if you compare this to the human body, the human body has a very low magnetic permeability.

It's similar as air. So the electromagnetic fields go through the body quite easily, not 100%, but quite easily. But if you, for instance, take a metal iron, it will absorb the magnetic field lines because it has a very high magnetic permeability, the iron, and it will block off a major part of the electromagnetic fields.

That's why I also say, if you treat a person on a mat and you put it on a bed, make sure you don't have metal or too many metal parts inside the bed, because they will disturb the electromagnetic field lines of what you try to apply.

So it's better to use a wooden table, for instance. Or air mattress, or other material, but not metal. Not metal, right. Now, this system shows you that the mu for, and in free space, the mu naught is UR, which is similar for air, and for the human body.

So this shows that electromagnetic fields will penetrate the body of a human being. Now, how do we explain this? That's a problem because there are, and we will get to that in a second, there are very complicated calculations for measuring and for establishing the electromagnetic field at a specific distance So as an example, and I repeat as an example, I use the only one point source.

In this case, it's a lamp. And everybody knows, it's very easy to understand. If I go away from the light, the light diminishes the further you go away from the light.

So if you are at the distance of one, let's say one inch from a light source, And you go up to a distance of, for instance, 10 inch or it could be feet or it could be meters or whatever, the intensity of the light drops dramatically.

And it's easy to understand. And that's also the example you use. it drops by the square, the inverse square of the distance. Now, this is correct for point light source, which is used for x-ray devices, for instance.

It's being used for gravitational measurements. But for electromagnetic fields, it's not the correct way to measure. But again, then we get… It can be an approximation.

It's a good approximation. Yes. You can use it as a comparison for explanations how electromagnetic fields diminishes in intensity over distance. Yes.

In fact, this is called, if I recall, this is Newton's law. I don't want to go into all kinds of laws like Coulomb, Newton, Faraday, Lenz. Exactly. It's complicated.

It's too complicated. And you know, if people are interested in this, everything is on the internet. They find it in Wikipedia with explanations, whatever.

But I don't want to go into it. But I want to just to outline the basics of electromagnetic measurements and how it's being developed. Now, this, for instance, is a very complicated formal line.

You see it here in another form. And this is true for a wire. What is being measured? There are two, there were two French scientists, one is by the name of Beal and the other Zavar, and it's called the Beal-Zavar law.

And this allows us to calculate at a certain point in space, the strengths of the electromagnetic fields. And there is another formula. Here's another example in a wire, and you get a certain distance.

How strong is the electromagnetic field still at that specific point? Let's concentrate one second on a circular coin. This is a coin, or electromagnetic coin.

We see the electromagnetic fields around the coin, and we wanna know what's going on over here, because we are not, we are laying on the flat surface of the coin when we are on the mat, but our body is, let's say, is a feet thick So I want to know what, if it penetrates still my bones and my cells completely.

So there are, again, here is the expression of the magnitude of the magnetic field of the biosavarlo. Looks very complicated. It is complicated. So this is not the time and the moment to go into this, because as I said before, people should Google the biosafarlow and they will understand that it's almost not understandable only when you are really into physics very deep.

And I just want to point out, we are interested in the field strength on this point P. Well, that's exactly at the axis of the coin or certain distance.

But I'm also interested, I want to know if the field is still here. and if the filter is still here. So what this number gives me, I'm not impressed with that.

But if you want to know it definitely, yes, there are calculations and you can fill in the current of the loop, you can fill out the radius of your loop, of your core, you get the b factor, the b is the electromagnetic field strength, also called h, when measured in human body, because it doesn't make a difference, or not much.

If you get it in Tesla, you get it in Gauss. You can also add what is the distance from the center of the loop, and then you get the strengths at that specific distance.

But I want to make life much easier by comparing what's the difference between high intensity versus low intensity electromagnetic fields. Here is the MRI.

Well, I read in one of your articles, you also refer to the MRI systems. And what is an MRI? An MRI needs a very, very strong electromagnetic field or a magnetic field, actually, to align the protons, which are actually tiny magnets inside the body of the, of a healthy, of every person, um, which is the center of hydrogen atoms.

And in those protons that are like tiny magnets and those tiny magnets can be aligned. So if we put the patients under a MRI in an MRI machine, we are going to align the protons under the electromagnetic fields of that specific person.

If there is no magnetic field, the protons are pointing in all kinds of directions. But as I said before, protons are tiny magnets. So as soon as I put them in a very, very strong electromagnetic field, and mind you, this is not a field which is, or it's a field which is much stronger than you have in a low intensity or medium intensity or possibly even high intensity PMF device.

These are strengths of the way you can have an MRI machine of half a Tesla, but if you want to get the good picture, the quality of the picture, you need one and a half tests going up to three Tesla.

So what happens actually is when a person live in an MRI machine and you start to hear bing, bong, bong, bong, all kinds of sounds, very loud sounds. That's the reason why a person in the machine gets a headphone and to with music, for instance, so it doesn't disturb too much.

And those noises are being caused by very strong electronic pulses going into gradient coils inside the MRI machines, which actually, with very much force, tilt the protons out of sync of the magnetic field.

Pulse Shape, Duty Cycle, and Energy Delivery

at the moment that the gradient is this, or that the radiofrequency field is being disrupted, the protons jump back into the straight direction and they emit a form of energy.

This energy is being measured in a very special way with cause and site device, and is the basis of being forming for the images of an MRI machine. You can get slices of pictures, And it's different results compared to CT machines.

CT machines are X-ray machines. But the MRI machines show, for instance, soft tissue. It shows cancers. And it has a different application. But again, I don't need the technical stuff behind it.

So that's the proof that you need very strong mechanism in order to penetrate the complete body. So why, if it's possible to have very low intensity devices, PMF devices, to penetrate the forebody, Why don't they make those very low intensity devices, also MRI machines, because it's not possible.

You need to completely penetrate through the body. So that's the reason why you need high intensities. Now, as I said before, electromagnetic fields are being inducted into the body of a human being.

And they create very small, very tiny currents, as I explained before, in the pH electric effect. the tiny currents they need to penetrate inside the blood, inside bone marrow, cerebellum, in the heart, in the kidney.

And this is a table which I created for pulsing frequencies of 10 hertz, which are popular for PMF devices, and showed the electric properties for the penetration of the different areas of the different tissues.

Here you can see, for instance, this number is a low number. So blood is easy. Blood has a certain contents of oxygen. It is partly paramagnetic. Diamagnetic depends on the saturation of oxygen and on the influence inside the blood of the magnetic particles.

But now look at the other end, the cerebellum, the head. It's five, six, seven times more difficult to penetrate with electrical currents than it is with blood.

Or look at the kidneys. It's very, very difficult to penetrate through the heart and through the kidney. So you can't just say, okay, use a low intensity PMF device for treatment of the brain or the kidneys.

But you might be able to use a very low intensity device, for instance, for blood treatments, because blood streams are very superficial in the capillaries under your skin.

So it's very easy to get there. So you don't need a lot of power, a lot of intensity to reach inside the blood. Here's another table. It's all kinds of difficult explanations.

Electromagnetic skin best, permittivity again, conductivity and wavelength, but you see differences. in the different, for fat, for muscle, for bulk, etc.

etc. And the different numbers in this table behind. Now, also the skin. Their skin and fat and muscle have different

propagation for waves. So if I want to penetrate deep inside the body, or if I…

Let me give another example. Modern implanted devices like pacemakers, or like other device pumps, insulin pumps, which are implanted into the body of a patient.

Well, the surgeons like to implant those devices in fatty tissue, not in the skin, that's too superficial, but not in the muscle as well. And why do they want to implant the effect?

Because those devices can be charged like you charge your smartphone on a pad by placing your smartphone on the charging pad. The same can be done over here because the wave propagation effect is much lower than for muscles.

So to charge a battery inside an implantive device inside the body of the patient is much easier because the wave propagation inside fit is lower than a surrounding muscle or bones even or whatever.

Now you're talking about electrical or wave transmission or what what is the wave that's transmitting through fat versus muscle? It's electromagnetic waves actually which you are going to induct into the body of the patient.

So you want to do that as easy as possible. Although the magnetic field penetrates through all the tissues in the body equally. Yes, yes and no, this way.

The body, and that's this picture actually, because your question was expected, sorry. This is a picture for light, but the skin has sweat the skin is not flat for electromagnetic degrees.

It has a different superficial adhesion of strange materials and not all the electromagnetic intensity you want to induct into the body of the patient gets through.

And this is not critical for high intensity devices, but it might be critical for low intensity devices because anyhow they have a problem already to penetrate deep inside the body if at all.

So they will suffer also like if this is for instance non-transparent glass which you have in the shower for instance. A part of light is being reflected, a part is being absorbed inside the glass, a part is being scattered around in another direction and only part is being transmitted through the skin inside the body of the patient.

I don't say this is a major issue but it might have influence and it possibly does have influence on very low intensity electromagnetic field devices.

Now, let's talk a little bit about magnetic flux density. I don't need to explain what you are seeing over here. If I open my faucet very, very far, I get a lot of stuff, a lot of water going through.

If I open it just a little bit, that's all I get is a couple of drops. Now, let's continue to the next slide. And look at this. If you have a coil over here, and my field strengths go through it, through this area, or I have a larger coil with a larger magnetic flux, a larger magnetic flux density, then I get much more magnetic intensity inside the body of the patient.

And I will get back to this in a minute, because this is very important for the size of the coil. and this has a lot of implications for other possible information I will address a little bit later.

Let's first look at some basic stuff. Your body was designed to heal, but illness, chronic disease, stress, injury, and time can slow that process down.

What if you could restore your body's natural ability to recover, recharge, and feel its best? The key to healing is giving your body the energy to repair itself.

PEMF therapy does exactly that. Recharging your cells, improving circulation, reducing inflammation and helping

you function at your best. For decades, I've studied this technology, worked with hundreds of medical professionals and helped thousands of people reduce pain, regain energy and take control of their health.

However, not all PMF devices are created equal. No one size fits all. We offer personalized consultations so you can find the right device for your needs, backed by real science and trusted results.

If you're ready for a real solution, let's talk. Schedule a consultation at drpauluk.com. That's P-R-P-A-W-L-U-K.com because real healing starts at the cellular level.

Sinus waves, the red one or a square wave or a triangle wave or a sawtooth wave. A lot of information is going on the internet from which one is the most important one.

Talking about NASA studies and all kinds of different publications, which is the right form of a wave for electromagnetic therapy. And, well, I won't, let's put it this way, Fourier, oh, sorry, I apologize using the name Fourier, but he said that all the other forms of waves are part of a sine wave, and this can be proven also actually by using the right formulas.

But let's take a look at, for instance, the square wave, or look at a kind of triangle wave, because if I induct into the body a square wave, I don't get inside the body exactly this wave.

It is more being bent off because of the transition time, because of the obstructions it meets although the body is transparent for electromagnetic waves, it's also being influenced by all kinds of external reasons.

But I just wanted to show that this area is a critical area and you don't get the very fast time of what you call also dVdT. I will get back to that in a second.

because db dt is the rate of change of the magnetic field over time, and it's being expressed in Tesla per seconds. Now, this whole discussion about the form of what's good or not good for PMF, I think is exaggerated and possibly even wrong.

What is correct is we have to look at the duty cycle. The duty cycle is when a signal is being inducted into the body and when it's switched off. The duty cycle, this is not a frequency, this is one frequency distance, but this is the during one pulse, how much time actually the energy is going into the body.

If it's a 50% duty cycle, 75% duty cycle and 25% duty cycle, these are just a couple of examples. Now, it's often not addressed, for instance, by very low intensity or possibly medium intensity battery devices.

Battery devices need to get their energy from the battery. Rechargeable or not rechargeable doesn't matter. All the energy they take from the battery, almost all the energy goes into the pulse itself.

So if you have a duty cycle of 50% or more, that battery will be exhausted very, very fast. So the manufacturers of those devices look probably more at a very short duty cycle.

And why is it important to extend the battery life? But on the other hand, PMF is energy medicine. I want to put into the body of a patient energy. And if I have a very short duty cycle, The amount of energy is very, very low.

I get back to that later on as well. Oh, here it is already. Okay. If I have a very short pulse, and this is an example of a 4,000 Gauss energy pulse by high intensity devices, like a spark-up systems or like flash devices, which give a very, very short 200 microseconds, so less than a millisecond a second pulse, the intensity is very, very high.

But the pulse is so short that inside the pulse, there's hardly any energy. But if you look at the different systems, like the true oscillating or what they are called, a And you look here at the 500 gauss, for instance, for the 3D Ultra, you get, when you have a duty cycle, more than 50%, you get an enormous amount of energy, which you induct into the body of the patients.

And that's what's called energy. Really, energy medicine. This, I can hardly call energy medicine. I just wanted to differentiate and point out, it's nice to have very high intensity pulses, but the application for very high intensity, pulses is more for, yeah, I'd like to call it numbing up issue or numbing up nerves.

And this is more for treatment, the underlying reason why somebody needs sufficient PMF energy to get in depth within the body.

Coil Design and Field Distribution

Now, I talked about DBDT and that's what you did also in your article. That's the speed of a how fast the energy is being inducted into the body of the patient.

And the faster the intensity is being changed, or it's called the speed of induction or the slew rate. It's also called slew rate. That's actually DBDT.

It's the change of the electromagnetic energy over time. and if you can keep it as short as possible to inject as much as possible energy. In the shortest possible time, I inject, I penetrate completely inside cells, inside tissue.

I might even get the electroporation effect in cells, which makes them more transparent for other influences, detoxification, or inducting in possible other medications inside cells, energy inside cells.

Or nutrients? Or nutrients, of course, yes. And to energy yourselves, ATP, what was being called. And that's why it's so important to have a short DDT or to have a fast speed of induction inside the body of the patient.

And why do I say this? Because using a triangle pulse, or a sinus pulse, which is very slow, you don't get the very deep effect which you want to obtain inside bone and inside difficult to penetrate like the brain most effectively.

So that's why it's important to have a pulse which goes fast inside the body as possible. Now, so this looks ideal, right? We have here, let's say three hertz, three pulses per in a second, if this is a second.

and I use a square wave, but it doesn't work that way because I want to induct energy inside the pulse as well. So I go to my next slide and that's what we do.

We have a basic sinus wave as basis for our devices. Now, what we do is inside that orange square we saw here before are a series of those pulses. Now, as I said before, a sinus wave starts very slowly, so I don't get the effect as fast as possible inside the body.

But when we can detect, when the signal is at its height, the highest point of the sinus signal, and then switch it on in the body, I get a very, very fast rise time, inside the block which I showed before, the orange block before, and this is all energy inducted, the blue area, inducted into the body of the patient inside each individual pulse in that window, that orange window I showed you before.

So how can I influence the amount of energy that goes into the body? So first of all I established that the fast rise time, the dVdT, yes, we have over here, because it extremely sharpens.

Then we have a couple of these inside each block itself. Even if it's three pulses per second, we have inside each one, a couple of those. These are all energy inducted into each, into the body of the patient.

But I don't always need the highest intensities. So what do I do? I cut off the sine wave and I use only this part, but I still get a very, very, very fast rise time over here.

So I don't trade off. I always get inside the orange window I showed before. Even if I use lower intensities, I get the same amount at the same speed of rise time.

inside the body of the patient. Now let's talk a little bit about meds. There are different mattresses or meds if you

want to call it. You probably recognize this one.

This is a very funny way of manufacturing a whole body meds. First of all, if this is the head sign, why are there so, this coil has many, many less turns or many less copper turns than this one and these ones?

I don't quite understand it. If the brain is much more difficult to penetrate and the kidneys are much more difficult to penetrate, why would I put all the energy on my legs?

I don't quite understand this. I also don't understand why they have a large surface. Some people say, yeah, because the surface is large, you get a lot of intensity, but it's not true.

Because also this device, specific device, has a very low current. So the amount of intensity of energy being generated by these calls is very, very low.

Now look at another way of doing it. There's another device which has an experimental map which consists of a many, many, many, four, eight, five, 32 cores are over here.

But they're all very small cores. And the series more cause they overlap over here. And, but that's a different issue. I might get that later back to that as well.

These are very, very low intensity imaging coils. And I have my strong doubts, although they are spread out if they are covering the complete range, because inside over here is possibly not so much intensity as here.

And I know that this device is a battery powered device. And I told, said already before, a battery powered device, well, it needs to get its energy somewhere.

It might even be a square wave pulse. But again, I am not into saying which one is better than the other one. I'm just trying to elaborate a little bit on the different a wave and matrices and applicators are being manufactured.

What we do is different. We have eight chords spread out through the matrix evenly as much as possible. Scientifically, it's impossible to get an even field over here.

That's impossible. because of the bias survival of what we talked before. But the electromagnetic field is not only here, but it spreads out over here as well.

And it spreads out over here as well. So we get more or less even an electromagnetic field, whereas all these curves are pulsed at the same time. Whereas in this one, I'm not quite sure if they are pulsed at the same time, possibly even one after the other.

Well, you probably know better than I do, right? So part of the concept is that if the energy is flowing from the left to the right, it takes time. And as it takes time and distance, you have a loss of energy.

So the presumption would be that the bigger coils at the end are compensating for the time and distance factors. I don't know what the theory is behind it, but OK, let's go back.

OK, but it's not perfect. So what we try to do, we have a very different configuration of two very large, heavy, thick coils into the 3D ultra system.

And I'm going and getting over here some more explanations in my a little bit further on. Let me see if it's already there already because I might have skipped.

Yes, I might have skipped. Let me go back to a different screen and I want to share this screen with you. Let me see how I'm going to share this screen with you.

My screen sharing is a new share. I'm going to share this one with you. All right. I have here an active

demonstration where you can see inside you see the small yellow coil inside over here yes okay now if you have a electromagnetic field over here the concentration is close to the coil itself but the field lines they spread out but the intensity when you have a very small coil is not very big what i can do i can increase the current going through the coil over here and i'm going to do that over here I'm going to increase the current.

Now, you will see the field has extended somewhat more, but the highest concentration of the field is still close to the coil. It doesn't spread out as much as you would like to, even if I increase the current of the coil even more, it's still concentrated very close to the coil itself.

Now I'm going back and I'm going to increase the size of the coil. Look what's happening over here. The field density is being spread out over a larger area, more evenly.

Well, the current is still low, but I have a large coil. I'm going to increase the current even more in the coil. You see what happens over here? Also the far fields, farther away from the coil itself, the intensity increases.

So I have a very nice spread. Now, I said before the two large coils of the 3D auto system, two in the matrix. Let's go there. Let's go to the very large coil, but the main field is still around concentrated the coil, which is not bad at all.

And now I'm going to increase my current. Look at this. You get a nicely evenly spread electromagnetic field. And so the bigger the coils, the better the spread, but this requires a high current.

And I will get back to that later on when I'm going to show you another slide. Let people see where the body would be. I beg your pardon? Where would the body be on that coil?

Oh, the whole top part of your torso would be here. And then there's another coil over here then, and there's the rest of the body. So your whole body is being, as I like to call it, vast.

in electromagnetic fields. That coil is in a pad that is horizontal and flat. Yes. The body lays on top of it. Correct. You lay on top of it. You can have another patient laying under the pad.

I call that 3D treatment. All right. Okay. So this is a nice, I think it's a demonstration which shows more or less or exactly what's important and what's less important.

Okay, let's go to the next slide. Let's talk a little bit about the transcranial magnetic stimulation. TMS is called. TMS is something different. We overlap and maybe if you allow me to misuse a little bit the word of PMF for brain treatment.

Yes or no? I don't know. But what I do know is that TMS treatment works differently. TMS is transcranial magnetic stimulation. is using a coil which generates up to a Tesla, 10,000 Gauss of electromagnetic fields around the coil being held over the skull of the patient, of the person being treated, inducing so-called eddy currents, electromagnetic currents, electric currents, sorry, inside the brain of the patient.

And why is this important? because this is an important treatment for depression. That's the main applications, although they're also looking at Alzheimer's and Parkinson's.

Yeah, right. Basically any neurologic process. Absolutely, yes. By using a coil like this with a very high intensity, you can penetrate inside the brain and reach the dorsolateral prefrontal cortex, which is the part we want to treat for depression.

TMS, Brain Stimulation, and Depression

It's at the front side of the brain, but in order to locate the area, you have to do a couple of tricks, which is being done with a true RTMS, repetitive transcranial magnetic field therapy applications, which like brainwave or a Neurosoft or There are specialized companies who manufacture these kinds of devices.

But let's look now, why do I point out the size of the cores? They use handheld cores, for instance, a four-inch core, 10 centimeters, or a six-inch core, and you need two Tesla to penetrate three centimeters, a little bit over one inch inside the brain of a patient, if you use a 6-inch coil.

If you use a 4-inch coil, yes, you can get away with one Tesla to penetrate deep inside the brain. And why do I need to get deep inside the brain of a patient?

Because I want to have in the area, in the dorsal lateral prefrontal area, here I want to create electric currents. And that requires those kinds of applicators.

Now, having said this, applications are better done with a so-called figure eight coil, that's not difficult this name, or a butterfly. Why is this? A butterfly coil behaves differently.

If I compare a single coil or a butterfly coil, I see a 3D rendering of a single coil, which has a wide field over a larger area, which I can see over here.

The red area is where it works the strongest and it spreads out over here, but I'm interested in this area. So this was the area in the brain I actually wanted to treat for depression.

So when I use a double coil, a figure eight coil or a butterfly coil, I get a different spread, a deeper penetration between where the two coils, which are actually built in a very special way, meet each other.

Here, this area is more even area, more concentrated, of course, then you can see over here, it's more spread out. So this is the applicator of a preferred preference for treating with high intensity, for instance, Parkinson's or depression, which is FDA approved for depression.

And there are other areas which are being evaluated as well. So that's why I wanted to point out the applications of butterfly calls as well. Now, how does it work?

Because when we go back over here, and I want to treat this area, I don't know to find it exactly. So there are ways to find it. Because in this area of the brain, when I do stimulation, then I can see a visual movement of my fingers or thumb when I stimulate the area in the more or less in the middle of the brain.

And then I know the more or less the distance between this area and the area I want to treat actually. This is called a motor evoke potential, which I'm applying a one pulse And I want to see them that the patient actually moves his thumb or his finger as a response.

And then I know it's around five centimeters, a little bit more to the center of the brain, the area I need to treat. How does that happen? Because this area corresponds with the motor neurons who go through the peripheral nerves, fire the muscle inside the fingers or in the thumb.

And you can also see it. For instance, if you take our keratin flash device and you use the smaller pad or you fold the larger coil into a butterfly coil and you put it under your arm, you can actually see the movement because it's very high intensity movement in your hand.

All right, but I don't want to promote any specific machine at the moment, so let's go to the next one. This is, okay, these are the first way of how the FDA approved treatment of depressions with a 10 hertz intensity of 120 hertz of the effect of movement of my thumb when I did the MEP, the motor resolve movement.

Let me back up for one second. I think what you said about stimulating the muscle, you're stimulating with the flash, you're stimulating the muscle directly through the nerve fibers that control the muscle.

Yes. In the RTMS situation, they're stimulating the brain, the cortex that then sends, as you said, sends a signal down. So this is more indirect, whereas this is more direct.

Correct. When you put it on your arm, it's a direct firing of the motor neurons and which actually have the effect, the same effect as if you know it has the effect of stimulating simply directly the muscles inside the forearm.

Here you have a different reason why you want to find the area because we know more or less the distance we need between where we can stimulate the, when we can get the motor evolved potential for a movement of the thumb in the patient.

And then we know that again is an approximation. That approximation of stimulating the motor cortex. And you say, well, that means that probably we're going to produce enough energy in the brain.

If we move it to the front part of the brain, where we're going to stimulate the cortex, we know we have enough energy then. Absolutely. And we increase the energy then the TMS machines.

they set a certain level of obtaining the effect and the movement of the thumb, but then you can increase the intensity, the Tesla's, when you are going to treat the depression in a different area, which you cannot do when you are, because I attended a training course in TMS and I had my head stimulated and I saw light flashes actually, Okay, you stimulate more to the backside of that.

Yeah, right. It was interesting but also a little bit scary. Let me just interject for one second before you go to the next set of slides. RTMS was designed largely to replace ECT.

Yes. electroconvulsive therapy. That's why they're so interested in using charge and a specific amount of charge because you're trying to replicate what you do with ECT, which is more or less barbaric.

It's electrocuting somebody. This is not electrocution. This is magnetic induction. But that's the history behind it. But they've also shown significantly in many, many studies now that that stimulation to that motor cortex Even though it's electrical there, the magnetic field still goes through the rest of the brain, right?

And that means it's still going to produce all kinds of other changes downstream from the area from the main focus of electrical stimulation. That's another discussion.

Yeah, you put your finger exactly on a very sensitive point where you talk with experts in the field of TMS. Because when you ask them, how does it work?

Why should you use one hertz? Why should you use five hertz? Or why even 10 words for treatment of depression? Why do you use the left side of the brain and not the right side of the brain?

And when this question was put during this course to one of the lecturers over there, who is world famous expert in TMS, Professor Fitzgerald from Australia, he said, we don't know.

We simply, we don't know. And exactly what you said is true. He said maybe if you put it on the right side of our brain, it will have the same effect.

I'll tell you why. Yeah, it's it's a there's a law in Islam and a fable. Okay. All right. And the fable is somebody's walking down the street and looking at somebody who's looking under the light for something.

The guy who comes up to the person looking under the light says, why are you looking here? Why are you looking here? He said, well, I lost my key. Well, where'd you lose your key?

Well, over there. But why are you looking here? Because this is where the light is. So what we're doing is we have a theory and everybody based on that theory and then the science follows that.

Everybody based on that theory says, well, then that's all there is, which is clearly not true. You're a hundred percent right. Absolutely. And it's a very interesting application of photoelectromagnetic fields for brain treatment.

It's only a pity that nobody explains it or nobody can explain how it exactly works, but it works. And that's the interesting thing. So that's why it also takes a long time to get a VA approval for TMS because you have to show it works, but you cannot explain it to them.

And that sometimes is a problem. There are other reasons why aspirin works either. Why aspirin works? Yes. We have some theories about why aspirin works.

Okay. But we don't know for sure why aspirin works or how it works. But those theories are what causes it to be approved. We know it has more effects than just the one theory.

The 50% placebo effect. What does that do? How do we start to interrupt? No, no, no problem. Okay. I just wanted to point out there are also small battery devices which use very small cords, which have a diameter of two inch, five centimeters.

And the electromagnetic field is very, very much inside this area and not so much outside the area. For reasons I already elaborated before, but there is one problem.

If you have two cords and you use them too close together, and you don't know in what direction the electromagnetic field goes, you get opposing fields and you get the repulsion of the fields.

So sometimes that's not explained to people and it's not the manuals or whatever and you don't even know which side of the coil is the right side. So you need to be very, very careful.

Some call it Helmholtz cores, but that's wrong. These are Helmholtz cores. The Helmholtz cores, they create an even field inside two cores. Here are the two cores, horizontal, and this is a very nice, even electromagnetic field.

Correct, those are Helmholtz cores. But there are certain laws, and not to mention, Helmholtz was a German scientist, and these cores are called optimum, which means that the half of the diameter, half of the diameter must be exactly between those two coils in order to create this field.

And if they are not exactly at half the diameter, if I have a two inch coil and this distance is not exactly one coil, for instance, it's two inch, when you place it on the shoulder or three inch even, or on the knee, you don't get a nice even field.

And in bad luck, this might even happen, you get recalls of it. So that's why I wanted to point out that using two currents, one opposite the other, is not always a wise thing to do.

Okay, this is my last slide, because it shows what we are doing. This is the home therapy system, which you mentioned before, it's 7,000 microtesmas, 70 gauss on the whole body pad, and 20,000 microtesmas, 200 gauss on the smaller pad.

It's a universal system. It has very steep rise times dbdt and it's a high intensity. It's the basic high intensity machine we manufacture, which you sell as the pharma machines.

And it's also called the curatron system. Then we have the next in line. which you also like to recommend very often, which is the XPSC or the Pro device, which has higher power, also more applicator possibilities, even faster rise times, different energy possibilities, then we have the similar system like this.

the PC system, which you can hook up to a PC, create your own programs, your own protocols, including your own here, here it is, new neural programs are now available.

Your programs are available inside the PC software. And then we have these three systems have eight cores inside them, as I showed you on the on the metrics pictures.

And this is the 3D ultra system, which has the two very large cores inside them. and they create 500,000, 50,000

microtestors with large body mattress and on a very small butterfly coil, $1,600 even, 160,000 microtestors.

This is top of the line system. And those are true oscillating energy medicine devices.

Choosing the Right PEMF System

Then we have the high intensity impulse devices, which is similar to SPARCAP systems, only without the SPARCAP, but the solid-state technology, which is the flash-melting system, which creates up to 4,000 Gauss, very small pulses, not energy medicine, but high intensity impulse device and then the premium flash device, which can create over 7,000 doubts.

And with this one, for instance, you can see if you fold the loop into a coil or lose the smaller one, you can see the reaction when you stimulate under your arm and you can move your hands.

You see movement, you can hang the ring or the loop around the neck and you see the muscle movements in your shoulders. but that these are the two lines the manufacturer so there is a wide choice of different devices you can offer to your patients and this I don't throw your money away in the money pit but what's important and that's what we actually talked about in the beginning penetration depth the high intensity is required for PMS devices depends on a Core diameter, which I explained and I showed to you in the movement of the electromagnetic fields, a picture before where I increased and decreased the current inside the core and changed the sizes of the core itself.

Penetration that depends on the dPDT or the speed of induction of the electromagnetic fields in the shortest possible time, which is expressed in Tesla per second.

It depends on the field intensity, which is magnetic flux intensity, and the field density, how dense the magnetic flux inside the coil is. And the larger the coil, the more flux density you can contain, provided that you use coils with the diameter of each individual wire inside the coil is sufficient.

to carry the current. Oh, I wrote twice the same, sorry. The purity of the coil, the purity of the copper inside the coil itself is very, very important.

The amount of turns inside the coil, because each turn gives a certain amount of energy, of intensity. So the more turns you have in a coil, the more field intensity you get.

But the more turns you have, the higher the resistance of the coil. The higher the resistance of the coil, it becomes more difficult to have sufficient current running through the coil itself.

And that's why we need also sufficient electrical current. So you can't just say, OK, I need to take a thin wire. I make as many, many turns in the coil as I want to.

because then the current cannot carry sufficient current in order to generate sufficient magnetic flux, magnetic intensity. So it's not just one thing, it's a combination of many different electrotechnical electronics in order to be able to generate sufficient intensity to penetrate completely the body and to obtain the right penetration desks inside the tissue, inside the cells to obtain opening of the cells to penetrate the bones.

for treatment of osteoporosis to treat osteoarthritis. That was good. Very good. Thank you. It gives us your history, a good explanation about those factors that are important in designing a system.

And that's one of the key things that I want to make sure that people understand. Every magnetic system has value. Doesn't matter who makes it, doesn't matter what it is.

Even these very, very low intensity systems have some value. Yes. But it depends on one's goals and objectives. As you said, if you're trying to treat deep into the brain, then you're probably going to have to have a lot more intensity to deliver enough charge into the tissues to do the job that you're looking to do.

Same thing applies to the heart, or to the kidneys, or deeper into the body. So those are important factors. And what I'm trying to do basically is get people to understand, yes, you're going to make a choice about a system, but you have to understand the system to know what it's going to give you.

And unfortunately what I find too often is that people make their choice based on cost, right? I can only afford $700 for a system. Well, you're going to get $700 worth of value from your system.

If you're wanting a $700 system to do the work of a $10,000 system, You're not going to get it. But the problem is, Bill, that often when they buy a cheap system, they're disappointed in PMF.

And that's wrong. And that's why your advice is so important. So to make them understand that if they buy a $700 system, right, they get something. But they should not be disappointed if they don't get the effects they expect from a $700 system.

You can't color all PEMFs by a disappointment with one particular PEMF. You could even buy two or three different very high cost systems and still be disappointed because often it still depends on how you use it.

So there are many people who are advertising eight-minute treatments with your very low-intensity system. So how much change in the body is going to happen with treating for eight minutes with very low intensity?

Especially when you use a science signal only and not have a very steep DBDT. And one of the things that I do in my book, and I think you and I have had some of these discussions before, is I review the science not just the physics of it because that's less important to most people what they want to know is what will it do how will it help me and how do I use it so the key thing is to understand there is science and the science is all over the place if you look at 50 and in the book I have 50 different health conditions and I review the science that's available for those health conditions there is no one system that's used across all of these health conditions so you can't compare often from study to study, disease to disease, condition to condition.

That's why again you have to have an understanding and that's why we're doing this video is for you to teach people as well about some of the engineering aspects and the theoretical aspects of a system that you still have to know how to apply it and to use it properly.

The problem is that there are many many studies out there which use either a specific frequency or a specific intensity. and the people or your colleagues who don't understand what's involved, what is the speed of induction, what is the duty cycle, what is the DPDT, what is the intensity, they publish peer-reviewed studies whereas the data is incomplete because they use very limited electromagnetic field intensities.

And that's very, I find it disturbing because you don't know what conclusions lay people are going to get from these kinds of studies. And I think that's a pity.

So it's very important when you look at the study to know exactly the intensity of your magnetic field being used, the size of the cores and the penetration depth.

And if It's only fixed one frequency. or if they are using several different frequencies, which being applied one after the other, because to avoid adoption of the body, you mentioned the system which said, okay, eight minutes and use, and then your body gets adapted to the specific frequency.

You need to change the frequency during the treatment. And if you don't do that, you don't get the optimum results. And I don't know what your opinion is, but I've seen many tables of so-called scientific studies which say liver, this frequency, heart, this frequency.

You know, I have a problem with those studies because who knows? How can you prove this? Well, what happens is, unfortunately, those studies didn't compare all the parameters together, right?

They didn't have one system that varied the intensity, another system that varied the frequency, another system all

basically targeting the same objective.

So the number of variables that could have to be considered in designing a system, when you multiply all those variables out, you're talking about millions of combinations of possibilities.

And that's never going to happen in research. So we rarely know how one compares to another for the same problem or the same need. So we get close. What you do is you get a system, you use it, you find out what it's going to do for you.

And then you have to adjust. So I say that in an ideal world, if you had all the money that you could ever want, or even money that you don't need, you probably would end up only four or five different systems to cover the waterfront of the possibilities that could be needed.

Well, there are people out there who claim they have spent hundreds of thousands of dollars on the different systems and then sell one system and that should be then the only ultra system which is applicable for all different possibilities.

It doesn't exist. And again, if you read the book, can you read the 50 health conditions that I review with the science and research behind them? With all the flaws of the research and all the facts and the fact that most studies, as you said, don't give you an adequate description of the signal anyway.

So you're still left with some guesswork in terms of what you think. Actually, there's one technical question I have for you. We focused on the coil. and that we focus on basically the configuration of the field in the center of the coil.

But the coil, and disagree with me if I got this wrong, but at the coil itself is where the magnetic field is the strongest. According to my measurements, you're 100% right.

Like you showed that volcano slide, right? At the coil is where the field is the strongest. So right at the coil itself. Now, when you move away, but if you're laying on a coil with your body on it, a big area, you don't have one big coil.

You usually have, as you said, multiple coils. So I will often direct people to put a shoulder right over the ring of the coil if you want to get a higher intensity for that particular application.

where you're treating deeper into the body and you want to spread the field out, then you lay on top of a circular coil. So measurements at the edges of the coil and measurements above the surface of the coil are very different.

Ben, thank you so much. It was very, very educational. I really appreciate your slides. More education of people getting good science and not just selling a particular device.

We'll do our utmost and I'm happy that you are able to educate people because I think it's really necessary. and there are so many people out there in the field who are simply salespeople and have no clue what they are selling or they claim they know because they are whatever educated and they lack a lot of knowledge and they are biased towards the specific device they sell.

And that's the advantage you have. You have a lot of different devices. You have chosen to pick only those devices you think are the most useful and I completely support your efforts.

And I think you found the right way educating people and I highly appreciate the work. Well, thank you. And we appreciate your equipment as well. We know that it works.

And I'm glad that you broadened your line to include the higher intensity systems. There's still debate about whether high intensity heals, because you said the frequencies are energy medicine.

I'm going to disagree with you there. Even the high intensity is energy medicine. You know, you have this device

that you're treating the brain, motor cortex, and it's going to deliver energy, create charge production in the tissue, the induced electrical field.

But is that the only action of the magnetic field? It isn't. There's a lot more going on. It's not that simple. We have still a lot to learn. And most of it will be from applying it and using it and understanding.

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