How Red and Near-Infrared Light Support Healing and Recovery Transcript

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Webinar Introduction

What happens when the mitochondrial gets excited like that? We get reactive oxygen species temporarily that cause this reaction of a local anti-inflammatory signaling.

So we get an anti inflammatory localized response. We got more energy and then we got this vasodilation through nitric oxide. So imagine now these scenarios all coming together.

Hi, welcome to the Maps webinar series, Healing Tomorrow's Future.

Light Therapy Basics and Mechanism

We are thrilled to be bringing you this series packed with valuable information and education within our community. My name is Honey Rinusella and I'm the Executive Director of MAPS, the Medical Academy of Pediatrics and Special Needs.

Within these webinars, we're able to empower clinicians on the knowledge and tools to support patients facing a variety of health challenges. For more information on MAPS or to register for a conference, please visit us at www.medmaps.org.

Thanks for joining us on this journey towards a brighter, healthier future. All right. So tell me a little bit about what you do. What does Ellis do? Oh, well, I'm a naturopathic doctor and basically right now I am doing the LS Pro Systems Low Level Light Therapy.

It's targeted light therapy to different parts of the body for general circulatory benefits and targeted regions for quicker healing. Okay. And so what are the populations that you're working with primarily?

It's okay. So in terms of light therapy, basic understanding is you have photons, light energy. Energy can't be created or destroyed, so we're transferring light into the body.

When we take light therapy and transfer it into the body, we have these chromophores. They're light absorbing molecules. One of them is called cytochrome C oxidase.

And that is a heart of our mitochondrial. That's where the energy production is made. inside the cell and that's where oxygen is its acceptor. That's why we need oxygen to generate cellular energy, that is the combustion in there.

Red vs. Infrared Light Therapy

So what happens is when light therapy targets into a local region, it excites the chromophore and cytochrome C oxidase hydrogen protons come out, we start getting cellular energy.

So we're energizing local areas for injury, repair, just extra cellular. What happens when the mitochondrial gets excited like that? We get reactive oxygen species temporarily that cause this reaction of a local anti-inflammatory signaling.

So we get an anti-inflammatory localized response. We get more energy. And then we got this vasodilation through nitric oxide. Imagine now these scenarios all coming together.

You take light therapy, put it over a body part, let's say my wrist. And now what I'm doing is I am targeting all those photons of energy into the body beneath the skin, exciting these chromophores, creating this cellular energy.

All of a sudden there's a lot of the energy and we get a reaction of anti-inflammatory blood flow. So we're targeting an area to get more energy circulation, nutrients going in.

And so that's the simplicity of light therapy. It's just a targeted approach to generally help accelerate more energy. Another one of my fields of expertise is in hyperbaric medicine, which is whole body energy, right?

So the combination, we use that a lot so we can actually get a target response. Okay. So I know that a number of families that I work with, they're familiar with red light therapy.

Yes. Okay, so tell me the differences, the similarities about… Great question. Now, when you take wavelengths, we talk about wavelengths. and they're in nanometers.

So 600 to 900 is about the therapeutic level that we see beneath the skin for musculoskeletal, okay? And the 600 wavelengths, 630, let's say to 670 is red.

We visually see that as red, the higher the wavelength, like in the 800s, It's called infrared. We can't see it. And what happens, it's not linear, but you can generally say that greater the wavelength, the deeper it can get into the body.

So what happened is with red light therapy, we excite that cytochrome C oxidase, and now we're looking at tissue wound healing. and the ability of local skin and below that.

So a lot of times if we're looking at musculoskeletal, we are working with kids, let's say, and we working on muscles, gait with a physical therapist.

We'll use the red light therapy as a primary means of targeting with exercise therapy. Okay. Right? As we get deeper in the near-infrared, now we deeper into joints, deeper muscle tissue, and that's the generalization.

And I say it's not linear because there are certain wavelengths that will absorb with hemoglobin and water.

Clinical Uses for Kids and Families

But generally speaking, that's where you get it. Now a lot of times, so with LS-Pro systems, a of our pads are the combination of red and infrared in the pad.

So we're getting the benefit of both in that localized area. And the key things, like back in the day, we used to have the laser probes and our staff used push the skin down.

And what that happens is it causes this balloon-like effect of targeting right to that area, right? And so with technology, what we do is just wrap with Velcro, nice and tight, and each diode sticks out so it pushes the skin down.

So I can now dose an area very well for each one of those diodes. And the session for light therapy is only about 20 minutes. And anytime that we have an area that want to affect outcome measures, we can use light therapy.

Now people will say, well, what about the brain? Absolutely. Light can cross the skin and the skull and cause that same energy cycle. So the cerebral blood flow can rise.

Now you get more energy through the blood flow, but then the targeted effects. So a lot of times we'll do frontal lobe right over here and target light therapy to help in effectiveness for therapeutic gains.

Then again, reduce inflammation. What happens with a injured grains, we have neuroinflammation. We want to really reduce that neuro inflammation and really help start that energy process, right?

And a very simple procedure is light therapy. Okay, now a lot of those that will be listening are parents, and they

have kids with autism, maybe Lyme, exposure to Lyne pans, Pandas.

So how can this help their child? First thing is any area that we're trying to target with inflammation. So GI inflammation, neuroinflammation, we are trying reduce the impedance of those local areas, right?

You do have areas that we're working on. Okay, so let's talk the brain first because that's the primary area we like to target. So a lot of times in our protocols, we'll do either a full head cap or a frontal lobe.

And the full-head cap is nice, easy to apply with the kids. A lot of times enjoy that you know but what's happening is during that time we have a protocol that we just want to help that reorganization right so might be a couple of weeks of just not doing anything, putting the head cap on.

And then what we start doing is transitioning to exercise. I don't mean physical exercise, we'll put the the cap cap and then during the 20 minute session we will do cognitive exercises.

So maybe on Monday they might do arithmetic, Tuesday reading. We'll try to do different areas and tracks of the brain while we have more energy. And so you're targeting inactivity levels to those areas, right?

At the same time, we'll look at where is the focus. We might have a one-month focus that we're working with physical therapists, and we might be targeting the areas of fine or gross motor control.

alongside with that. We might be doing speech, vision therapy, a vision, therapy at the same time. So there's different, and that's what we mean by targeting areas.

And again, we can also do musculoskeletal joints, inflammation, pain. One of the strongest therapeutic gains that we see is, especially if it's applied correctly, is that inflammatory, if you apply the light therapy correctly with that dosage, it's such a strong anti-inflammatory and a lot of times that immediately is with inflammatory pain, right?

So any areas where there's pain, injury is a primary means that will focus. Muscle relaxation, spasticity, right? So as we're looking at what is the, where are we looking to target the areas?

Treatment Setup, Dosage, and Recovery

Does that make sense? Well, we do have an eye mask as well. A lot of times it's used for more circadian rhythm sleep. OK. And that's a popular one, especially in the northern areas.

But yeah, so that a nutshell on the light therapy. So clinical uses, you can say injuries, pain, inflammation. Now that getting back to your first question, but going through the mechanism of action.

Yeah. and then a neurocognitive, the brain, right? Great. No, I think all of this, you can just see how it's complementary to a lot of the other things you mentioned, actual rehabilitation, like physical therapy and speech therapy.

But then also I would imagine things like what you also do, which is the hyperbarics and really making this holistic yet individual Yeah, in my experience, 26, 27 years now with hyperbarics and with light therapy, both are very strong at energizing the body.

And what I learned is the human body, if you cut your skin, skin heals. We're oxygen energy dependent. That mitochondria is so important. And that's your energy cycle.

You can heal. And not only when you do light therapy, do you get quicker repair shown in our research data, but the actual tissue repair, the type one to four polygen ratio is more tensile, so stronger repair.

So stronger collagen tissue. And I guess I forgot to mention when you asked red light therapy, what do a lot of people use it for? And collagen, of course.

And that’s that tightening. Yeah, yeah. So this is really for anybody with an injury, neuroinflammation in general. You know, a lot of times, you know you asked me about parents with children, we’ll actually be working on parents as well.

And because when you’re a parent, and in my practice, going from this appointment to this, appointment, to disappointment, you know, and getting a chance to just do a 20 minute siesta.

And so we have a three pad system, the eye mask, a neck pad, one over the chest and on a zero gravity chair. It’s like a total reset during the day. It’s like a vacation.

We love doing that for parents while we’re working on therapies with the kids. But the actual taking care of the parents are so important because that then gives more energy to give back to doing the parenting.

Exactly. Is there anything else that’s important that I haven’t asked you in terms of what you do and what I think, you know what, light therapy, it’s a very simple procedure.

There’s lot of light-therapy devices. With ours, we’re very specific on dosaging and really… The thing is, the further away that you are, It’s dose-responsive light inverse relationship that your losing your dosage like a quarter of the dosage, even to the skin, you lose 80% of those.

And so if we apply right to skin and that’s why that Velcro is nice. So we don’t need a staff member for 20 minutes holding on. I think with the procedure, it’s making sure that it is applied correctly and then targeted.

with all that energy, what is the body going to do? And one thing we didn’t talk about is that mitochondrial biogenesis. So what happens is when you get this energy level with that reactive organism species, we started getting these signaling molecules and saying, hey, let’s start creating more mitochondria.

more powerhouses, more energy production, because more of a long-term combination intervention. That’s great. Thank you so much. I really appreciate it.

Learned a lot. So thank you. Thanks so for joining us today.