Hello, everyone. In today's episode, we talk about cold therapy, saunas and how to fit them into your lifestyle. Please enjoy.

Welcome to the Perfect Workout podcast where fitness meets simplicity. I'm Kyle Recchia, CEO of The Perfect Workout. I'm joined by Jim Keen director of training. We hope you enjoyed today's episode.

Welcome back, everybody. We're back. We're back. Today we're gonna get into some of those. Let's call them Biohackers. We're going to talk about some really cool equipment.

We kind of talked about this a little bit in prior episodes, and we said we go deeper in a future episode. This is that episode. This is the one. We're going to go deeper. We're gonna do it. And we're gonna go deeper into two things that are really, really, actually awesome and effective. There was a good book and I can't ever remember the the author, but it was called antifragile.

It was talked about. There you go, Nicholas. Yeah. Which also wrote, Black Swan, which we talked about. And some fooled by randomness. Yeah. Black Swan, some prior episodes. So great books. Pick those up if you'd like. Anyways, this idea of antifragile really talks about, or misses, right? It's this idea that the dose makes the poison.

You know, we want to do certain things to the body that would be challenging, like cold therapy. We're going to talk about that today that if you did, too much of it would not be a good thing. Icicle. But the right amount of it can actually be sort of a miracle. So today we're going to over sauna and we're going to go over cold punching and the do's and don'ts.

So let's kick it off a sauna. Sauna is this really awesome subject because and again I'll butcher the study. Will try to remember to put this in the notes. But it's been really well-studied. It's been around for a long time. You probably actually can talk about it. This famous Finnish study of 25 years or something. Yeah, they eventually did finish okay, this study, but they were finished.

The village said, you see what I've done here? It's late, it's late. So the main umbrella term could be, something you may have heard before called photo bio modulation, photo light bio. Your biology modulation, changing. Changing your biology using light. So photo bio modulation or PBM is something that has been studied. It's, you know, like you said, thousands of years old.

There's there's records of people in PC, dates doing contrasted cold and then hot and then cold and then hot. And, you probably all seen the videos of in Finland, the guys skating on ice, and then they dig a hole and jump in and, and then get into the sauna. So sauna heat is light and it's like near infrared and mid and far infrared heat is light.

So we can use those interchangeably. It's just not visible light. So the visible light spectrum is, you know, Roy G. Biv. And then when you get past the yellows, oranges and reds the next step is infrared which is heat. So when you shine light at a human body, there's certain effects. And in no particular order, some of the beneficial effects are first, there's it provokes the release of nitric oxide, and nitric oxide is inside the cells in response to the light coming in.

That nitric oxide leaves the cell, goes into circulation, goes into the endothelium to your veins, and arteries. And it's a vasodilator. So it why it dilates, it widens out your veins and arteries, which reduces your blood pressure and allows for improved circulation, which helps most everything. So any chemical messenger that needs to go somewhere has to go in the blood.

And so it vaso dilates, your endothelium. So that's the first thing. It improves circulation, reduces blood pressure and helps with cardiovascular metrics. The next thing is that, red light in particular and near infrared, it sinks far deeper into the body than other wavelengths. So it goes to three four inches, sometimes pass the epidermis past the skin, whereas ultraviolet and blue light, it doesn't go very deep.

In fact, when you're in a tanning booth and it's UV light, you don't actually need the goggles because just your eyelids are thick enough to completely prevent any of the UV light from getting to your eyeball. So no one actually ever needed those extra eye protection little things, because just the skin of your eyelid is thick enough.

It doesn't penetrate so red and infrared that heat, it penetrates. And so vasodilation it's penetration. So you're getting this effect deep into the deep tissues, versus other modalities and other therapies. Also, it helps to build what's called, fourth phase water. So it's, as Gerald Pollack, the University of Washington researcher who discovered this, he called it, exclusion zone water or easy.

And the reason they called it that was because normally H2O, it's two hydrogens and an oxygen. Well, H2O joins with another H2O molecule to create a hexagon, and these hexagons are stacked on top of each other so tightly that it excludes any particles and viruses. Bacteria, anything else in the water is pushed out to the side. It has a repelling effect.

So it's excluding. So exclusion zone water. If you put a filament into it you'll notice it has a negative net charge. The bulk water in your cells that is not stacked up the hexagons has a positive charge. So what do you have when you have a negative and a positive charge? Charge it. That's a battery. So the red light builds your battery.

You have your mitochondria which make adenosine triphosphate the ATP from the electron transport chain. However, this battery is responsible for the other part of the energy needed to run a human body. Gilbert, living in the 70s, won a Nobel Prize for doing the math and going fellas, the ATP story doesn't account for all the energy we use in our brain and our heart.

And everywhere there's got to be something else. And then it wasn't until later that we realized, yes, ATP is energy. It's currency for for, cells to use for energy. But this negative positive battery of exclusion zone to bulk water in the cells, that's the other part that makes human life possible. So red light improves your battery. It gives you more energy.

So it vaso dilates the cells. It gives you more energy and some lesser known effects. So like you've seen the red laser. You know, on people's faces to get rid of wrinkles. That's because red light provokes the production of elastin and collagen in the skin wherever it is. So people do the red like face masks for that purpose.

And it's highly effective because it does help build collagen and elastin in the skin, makes you look younger, gives you more energy, lowers your blood pressure, and builds your battery inside every one of your cells. So red light is awesome. So when you stack this stuff up in the red light and sun, it it answers a few questions.

One you have the heat element. And with the detox, I forgot because you have a sweating effect. So now you're detoxifying as well. The largest organ in your body, your skin. So yeah, the light, the photo bio modulation has that effect. But the heat itself does have a sauna effect, a spritzing effect, a sweating effect. Right. To help you, offload, toxic things that you've stored.

Yeah. So when people talk about red light, when they talk about saunas, we were like, hey, first of all, you can have a sauna that doesn't have red light. You can have red light that doesn't have so much of the heat. Right? So we highly recommend doing an infrared sauna that has light. And you could do red light therapy in an infrared sauna.

And the heat element because then you're stacking these benefits. The second piece of that is just like you said, there was a cool study. I think it was on firemen where, I think this is one of the cohorts that we know has the highest levels, parts per million of forever chemicals in their body. Oh, right. Oh, is the 911 fireman.

Yep. Who breathed in all the chemicals from the. Yeah. Yeah. So they had you know, you hear all over the media right now forever chemicals microplastics these sorts of things. And they're, they're pretty scary stuff. And we don't want to have these in the body. Well, they took this cohort who had the highest levels of, forever chemicals.

And of course they did. And half the firemen had the high levels. The other half had the high levels. This group sauna, this group didn't at the end, it was something like the the firemen who did saunas had a lower level forever chemicals than the standard population. Right. Did even that weren't firemen who didn't get exposed. So not only did they decrease their levels of that toxicity, but they decreased them even further than the levels that the standard population who were not exposed to those chemicals had.

So super cool. I think this is a reason that we see that study again on, there was like a 25 year study. And so essentially the people that did heat sauna, over in Finland, if they if they did it one

time a week, two times a week, up to 5 or 7 times a week. Yeah, it was it was kind of a linear result.

Was a dose response. Yes. The more you saw it, the more you decreased all cause mortality. Even when they adjusted for healthy habits, even they would adjust it out for well, maybe if people sauna, they're less likely to smoke. Or the type of person who saunas is also the type of person to avoid the destructive behaviors. They just so those out and the outcome was essentially this is as potent when it comes to decreasing all cause mortality of of certain things that we know of in addition to strength training.

Right. And then here's some of the reasons why what you got into. Yeah. So you have that piece. So if you're in a sauna, Hassan, you should. Yeah. If you're going to sauna, infrared sauna with red light therapy. Absolutely double whammy there. And then a lot of people like to get in this sauna. Plus cold therapy actually, before we jump to that, we didn't really get into the don'ts.

I think from my perspective, when it comes to the sauna, the thing to be most careful of because it helps with building muscle, helps with recovery is just hydration. When you say, yeah, yeah, you're releasing your dangerous place. It's like how the ads for Gatorade say you don't just lose water, you lose all these minerals. If you're going to be signing on a regular basis, be sure to have some sort of replacement.

Whether it's sport, drink, Gatorade, whatever it is. Just replace the potassium, the magnesium, the phosphorus, the sodium, because you're going to be losing a lot of water and and your circulation is going to be picking up, and you'd be surprised at how much you can lose. That's why wrestlers, when they have to make weight, they get in the sauna in a big trash bag.

And you'd be shocked that you get them with a sauna. You're 2 pounds lighter, that's 2 pounds of water. So just be sure that you're rehydrating and re mineralized with electrolytes. Yeah, we haven't done an episode. Yeah, we'll do it another time on hydration, but it's really, really important. And I think that's why sometimes people will get in Tucson is and they'll be like, man, it's not I'm not feeling as good as I thought I would.

Yeah, I kind of feel rundown. Yeah. On this side, you're getting a lot of great results. And on this side you're just not hydrating enough. So pretty simple. Get the electrolytes and get some water and you'll be fine. Yeah okay. So when you talk about sauna on the other side of the coin, that's hot. You have cold. Yeah.

And like you said, a lot of people put these together. Let's just before putting them together, let's just talk about cold therapy. What do we know about it? How is it beneficial and what should we look out for? So when the human body is exposed to the cold, it provokes several different adaptations from the body, and many of them are very productive and desirable.

So, I guess the basics center around our mitochondria, which are a little electromagnets inside our body that produce the ATP. So for those of you who don't know it, there's going to be a little technical, but, the mitochondria has something called the electron transport chain. And you might remember high school biology, the Krebs cycle, the citric acid cycle inside the mitochondria is your powerhouse of the cell.

And what happens is there's five stops along the way five cytochrome crome color. That will come in handy later. So the cytochrome an electron has a destiny and the electron visits the first cytochrome, and then something changes and there's enzymes at each stop, kill Q10 and there's cytochrome 12345. And by the end oxygen molecules paramagnetic. It's sucking the electron through the chain.

And and then as a result, the final step is it's turned into adenosine triphosphate. So that's how electrons are passed through the cycle. So think about this. This happens in the inner mitochondrial membrane. And the inner mitochondrial membrane is sitting inside of liquid. So the cytochrome ones that have come to sort of come through every stop along the chain, it's sitting in liquid.

Now water's kind of weird. Most things when they're heated they expand. And when they're cooled they contract metal, wood, what have you. For anybody who's ever left a beer in the freezer too long and forgot about it, you know that water is different. It's the opposite. What happens to water when it gets cooled? It expands and beer is mostly water.

That's why it exploded. So when water is heated, it contracts. And when it's cooled, it expands. So you get into the cold. Let's say I cold dumb your mitochondria. I need to create heat now so that you don't die. And then they create heat. And in response, the water in which the cytochrome said it shrinks. Because that's what happens to water when it's heated, it shrinks.

So now they're closer together. It's measured in angstroms, and now they're closer together. And a little bit goes a long way when we're talking about the tunneling of the electrons. So now every single mitochondria is able to tunnel more efficiently because the stops along the way are closer, because heat is being produced in the presence of water, which shrinks the water.

And that heat also heat infrared. It's light. We just talked about what happens when light it's water when this red light infrared near infrared. So your own mitochondria producing this are also building up that exclusion zone water building up the battery. And also your mitochondria produce ultraviolet light in the cold, which is weird. And it turns out that helps with leptin control and appetite control and all sorts of things were designed to do.

Summer is red light and heat. Winter. We have to produce our own light in the cold. So in winter, when light cycles are low, you better get into the cold so you can produce your own light to have that same effect where a little sun's inside us in the mitochondria, but they only produce when you're cold. So anyhow, so being in the cold, the main thing it does is it scoops up your mitochondria, makes them produce more energy more quickly in a, in a cleaner way.

And it also produces light to which we also have an adaptive response. So you're energized. It, spikes your testosterone, it spikes your dopamine signaling. You know, cocaine lasts for 15 minutes, has a big spike, comes back down a cold plunge of three minutes, has a higher spike and sustains for up to two hours afterwards. So this can help with addiction.

This can help you get what normally you get from scrolling, from the processed food, from coffee, from drugs. It's just a dopamine hit. Well, this can help you regulate your unit. So the cold is fantastic for depression, for anxiety, for mental health, for serotonin and dopamine balance. For all these brain things, the cold is fantastic. Your immune system is souped up by the cold in response to the cold, the body will create more white blood cells, higher T-cell counts, these types of things.

And then it's just the basic mitochondrial energy production that is souped up in response to being exposed to the cold. And, it turns out that, air is, like, you know, like heat conduction metals. The best, ER's the basically the worst, but in water. So just walking outside in the cold and as they say, a man in the cold is not necessarily a cold man.

So when you're heating up and your pilot lights on, you could be in the cold and you're just fine because you're heating up. And that's a healthy thing. But when you're in that so the cold tub is better than just walking out in the air, it's something like 24 times more conductive of the heat. And so the, the idea is spend 3 or 4 minutes in cold water, colder is better, but enough is enough.

Like half other things. Better than twice or nothing. You don't need to be it. Like with ice hitting you. It doesn't need to be miserable. Yeah, you just need even. Even because you're 98.6, even 70 degrees still has some effect, right? And some is better than nothing at all. Yeah. I mean, so there was a cool episode. I plug our podcast a lot on gabber lines and, she had somebody on that was really kind of a deep knowledge person on this stuff she gets into.

I wonder if I can speak to brown fat at all. Sure. Some of that activation. So we'll go to that in a second. But like you just said, there's actually kind of a curve there like for most people. In fact, she talks about her recommendation for for females is you don't want to jump right in to 40 degrees because the shock like the what happens to your hormones, things like that.

It's like you haven't really eased into it enough. So there can be a little bit of downside before you get all the upside. So she kind of talks about a tapering effect in that most of the the 8020, the 20% that produces 80% of results kind of comes around 50 degrees. So yes, if you can get colder over time, fantastic.

But if you're new to cold exposure, you don't have to go to somebody's house. My wife did this the other day. It was a really funny result, filling up with ice. Yeah. You don't think so? Jump into 33 degrees and then jump out as she did 15 seconds later and lose all the benefits she would have gained. Having done that, that's also maybe a little bit of brown fat.

And then, let's talk about the don'ts, because, when it comes to strength training and, you know, building muscle and inflammation, you know, it's important that we touch on that. Yeah. So, the brown fat story is that there's two types of adipose tissue or fat tissue in the body generally. Others white fat and brown fat. White fat is the stuff you squeeze on your stomach.

You know, cut someone open and look at it's like a liposuction. It's white. It's, it's just like fat that you would see marbling on a steak or, end cap of a of a tri tip or some sort of ribeye. So that's what we got mostly. And then there's brown fat. It's fat still. It's fatty acids, but it also has mitochondria inside the fat.

Now that's bizarre because, of course muscle and heart and brain, that's a lot of mitochondria because that's a lot of energy production. You might think, well, fat's just a storage organ. Why would it need to produce energy to burn energy? Isn't that the opposite? So there's this type of fat, very prevalent in newborns and young children.

Then you lose it over time. It's basically a way to heat you up without you having to do stuff. And the mitochondria inside are very high in what they call uncoupling proteins. So remember I mentioned the electron transport chain. There are proteins that can interact with the electron transport chain to uncouple the chain. So when the electrons come through they just spit out heat.

It just waste it as heat. So the electrons don't go through and create ATP. The electrons get uncoupled by this protein, and just spit out free heat. So it's very inefficient for the purpose of producing heat. So you're in the cold and your body's reaction, how are we going to how are we going to heat this person up?

We're going to die at some point if we stay in the cold. And so it makes you shiver. So that's muscular contraction, which is great for burning glucose. And that's, a little workout. So that's produces heat. But what else can we do in the body is very novel. So it can increase the amount of brown fat which increases the uncoupling protein.

It gets upregulated, increases in number and effect. And so that can help you heat up. And that also the presence of brown fat increases your resting metabolic rate, which then increases your total daily energy expenditure. Yeah. So you do this, you do it, you know, 2 or 3 times a week, maybe 2 to 3 minutes, 50 degrees.

So we're talking this is another one of those perfect workout things right. It's like 11 minutes maybe gives you a lot of the benefits. Right. You're doing this and we'll get into the don'ts in a moment. It's activating all those different elements that you just talked about. You're adding brown fat to the body. So just like babies who cannot regulate their temperature and they don't have muscles to move around a bunch of things, they're babies.

So I can't share a ton of the brown fat to heat them up. Yeah. So we lose it over time with the way evolution has it. But we can gain that back through being exposed to cold, which then, like

you said, ultimately, why would we do that? The outcome higher, burn calories throughout the day, higher resting metabolic rate, more need more movement.

So just more efficient. Fat burning. Yep. From being cold. Okay, so the domes on cold, they're being, other than simply being, you know, being there for 30 minutes, hypothermia for. I mean, this stuff is real. Don't turn into a Batman villain. Don't get a sound. On average, Mr. Freeze. Yeah, yeah, I say, Mr. Freeze. Yeah.

It's not like longer people will go out, you know, they haven't been exposed. Well, there's a few things here. One, haven't been exposed to this before. So now you're on this trip with a bunch of friends. You're like, I'm going to go jump in that lake. First of all, it's just the dangers of jumping into a lake when you have a lake.

Yeah, we were having to swim and your muscles aren't going to work right now because you're in shock is a good recipe for drowning. Yep. And then of course, the other more is better. I'm going to do this now for 15 minutes, right? That that dose and poison this one. So when I was first experimenting this, with this, it was, fall of 2013, I was, I had just moved to Chicago.

I got off the road, move to Chicago, and I was first learning about all this, you know, cold thermogenesis and cold snap. And, I was about a 15 minute bike ride from Lake Michigan to Chicago. And so I would ride a bike over there and I would swim in Lake Michigan. I started in August. Twits. The temperature was it was cold because it's Lake Michigan.

Yeah, but but it wasn't super bad. But I would do this probably 3 or 4 times a week. I'd go over there so I could acclimate. And by December and January it was in the teens and the 20s, and the ice had gone out past the beach to the point where you'd walk out on the ice. And I was in, boxers and wetsuit gloves and wetsuit boots and then a big floppy eared hat.

Yeah, with, Chicago Bears. See on it. Worse, I had it. There's, praise be to Ditka. Deep dish pizza used to keep me warm. The point is, I would go out there, and by the time I jumped in the water, I was like, neck deep in this, and there's ice hitting me. And honestly, like, when I climbed out, I was cherry red and just steaming.

And again, a man in the cold is not necessarily cold. Man, I felt incredible, I felt fantastic, this is so good. I didn't get sick all winter. But there was a time in February where, I noticed while I was in there that there was no one else on the beach because it's February, it's Montrose Beach, you know, in the in Chicago.

And, what I would do to avoid hypothermia, I, knew that the first thing that happens, to your point about be careful, is that you're fine. Motor control starts to fail. So when you join your thumb to all your fingers right now, you can go really fast, right? So the trick was, every couple of moments, you'd raise your wetsuit hand and you'd see how fast you can do this.

And there would come a point where this is as fast as you could do it, and and you're like, oh, it's time to get out. Standing out. And then I tried, but my muscles weren't working right. Everything was numb pretty quickly because it was very cold. But your gross motor control also starts to fail, so I couldn't pull myself apart.

So now I'm kind of. And there's no one else at the beach. And I'm looking, trying to figure out if I can find somewhere to put my foot. Man. And I was, I was like, oh, I can't die like this. How embarrassing. I can't some guy with a bears hat there. Yeah. And so I was able to clamber out and the adrenaline and I was able to do it.
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And I got home and as I was, undressing to take a shower, I noticed blood all over my, shins because I was completely numb. I didn't feel it, but I had scraped my legs up on the ice trying to climb out, and I think that was the end of the season for me. Yeah. So the benefits you're getting from cold therapy were.

Yeah, it's like, that was cool, but, not at the expense of, you know, the what could have gone wrong. So when you're doing this, one of the don'ts is don't be foolish and don't try to go too quickly. Start just ice in your bathtub or something. Like something, very basic. And another don't. Is that a lot of people like to combine the sauna or the cold with their workouts.

The sauna you can put before or after before. It's a great warm up, improves circulation after it improves. Recovery. So either one great. It can improve performance at the workout. It could also help you recover faster from the workout. The cold. Don't ever put the cold after the workout because the cold reduces inflammation drastically. And a workout, you need the inflammation so you have empty fuel.

Your adrenaline's up, you've torn up some muscle fibers. You've done a lot. And there is an inflammatory cascade that is highly desirable because that's a signal to the body. We need more glycogen in that muscle. We need to build new muscle fibers. We need to build hypertrophy. We need to build strength. We have all the stuff to do.

Let's go. So when you mute that signal with the cold, the adaptation is never produced because the signal's gone. So you don't want to short circuit it. However, putting it before the workout if you have that available to you, is highly effective because one the energy production I mentioned before about shrinking the water. So the electron transport chain transports faster, so you have better energy production and you take longer to fatigue in the workout.

One of the main mechanisms of fatigue is not actually the contractile properties of the protein in the muscle. You just overheat it. So when you overheat, that's the point at which the muscle can no longer forcefully contract. And you you hit failure and you tend to fatigue a lot. So if I start out cold, then the first part of my set actually just goes towards getting me back up to zero.

Then I start heating up. So you hit that point of I'm overheated, I need to stop a lot later. Ever. So starting cold increases your energy, reduces the likelihood and rapidity of the overheating.

Part of the fatigue. And it's fantastic before the workout, but certainly not after. After. Because you'll short circuit the very desirable and necessary inflammatory process.

That's acute. That comes from the workout. So cool. Yeah. People have written books on the stuff they've done for our podcast on this stuff. We won't do that today. Thank you. There are a lot of resources out there. I bring my notes. Yeah, but two of the hacks that we'll talk about, you know, in addition to your strength training, when it comes this idea of being antifragile again, the dose makes the poison and you don't need a lot here.

So get hot, get cold. You can do this free. You can. There are many ways to go get really hot in a free way. Get uncomfortable. Yep. You can take a cold shower with uncomfortable fun. Comfortable as well. Be careful of those pieces. Put them together in a way that's going to stack in those systems that you're creating to best meet your goals.

And have some fun with it. Yeah. Come in hot and cold. Hot and cold. Get into it. All right.