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*Recorded Voice:* Prepare to experience the strongest radio allowable by law. Secrets will be revealed, myths dispelled. From the studio gym where excuses never apply it's Super Human Radio with your host, Carl Lanore.

*Carl Lanore:* Hey, hey welcome back to another episode of Super Human Radio. We have a great show planned for you today. We're going to be covering quite a few really important subjects. We're going to be joined by Dr. Jim Stray-Gundersen to talk about Kaatsu training. There's a lot of discussion about Kaatsu, a lot of misinformation out there. There isn't a single person on the planet that knows more about it, even above and beyond the Japanese scientist that discovered it than Dr. Jim Stray-Gundersen, so we'll have some good questions and answers for him.

We started talking about Kaatsu training in early 2006 I did my first discussion with a Japanese scientist and ever since then it has really intrigued me and everybody else out there. We're going to get to the bottom of Kaatsu training today with Dr. James Stray-Gundersen. How you doing Dr. Gundersen?

*Dr. Stray-Gundersen:* Very good, thanks Carl.

*Carl Lanore:* Let me just give a brief highlight of your CV here because it's very impressive.

*Dr. Stray-Gundersen:* *[Chuckles]* Sure.

*Carl Lanore:* Well you're a general surgeon, which qualifies by the way to run for president now.

*Dr. Stray-Gundersen:* *[Laughs]*

*Carl Lanore:* University of Southwestern Medical School, Associate Professor in Exercise Science and Human Performance for the past 18 years; four Olympic games as physician or physiologist; twenty world championships at various sports physician, physiologist; altitude expert. We were just talking about the role of hypoxia and remodeling of fat cells in leptin sensitivity. World renowned anti-doping expert and involved in many sports to advance performance legally and ethically, NFL, ABA, FIFA, I mean your list goes on-and-on.

Why did you look at – what made you interested in Kaatsu training first of all?

*Dr. Stray-Gundersen:* Well it kind of goes back away. As you pointed out my initial education was as a general surgeon, but after I finished my general surgery residency I ended up doing some post-doctorate fellowships in cardiovascular physiology and another one in human nutrition. I kind of or I did fall in love with the idea of using the medicines of exercise and nutrition to promote health and fitness. And that wasn't really aligned with taking out gallbladders. So I ended up having a career as you pointed out in academic medicine and doing various research projects. But the key thing to all of these things is looking forward to how to optimize human health and fitness.

About four years ago I got introduced to Kaatsu. It just struck me as one of those things that is a real paradigm shifter in terms of how we can safely and effectively improve health and fitness in humans.

*Carl Lanore:* So Kaatsu was first written about in a paper from some Japanese scientists who were looking at Kaatsu. Correct me if I'm wrong because it's been awhile, but they were looking at Kaatsu not necessarily for performance, but as a therapeutic aid to recovering from an injury and avoiding the muscle loss generally seen from an injured limb, right?

*Dr. Stray-Gundersen:* Right. Right here is the essence of Kaatsu. So basically what we do is with very light weights that can be done by anybody whether they have an injury or not, we end up being able to do maximal strength training exercise. So that exercise then mitigates any atrophy that might be happening, but it also sets up a kind of hormonal situation where you end up adapting to the exercises that you've done, but you've tricked the brain. Normally to get this kind of hormonal release you have to be lifting really heavy loads and exhausting yourself and with Kaatsu you can do it with very light loads and in a short period of time. So it ends up being a very efficient way of doing this. Then there's applications for whether it's seniors who can't lift very heavy weights in the first place or someone who's injured, say someone who's torn their ACL and they're coming back from an ACL tear, but this is a way to exercise their quads to get that muscle mass back.

*Carl Lanore:* So and you know I've often thought what I'm about to say but I've never said it on the show, there's always this discussion about what builds bigger muscles?

*Dr. Stray-Gundersen:* Yeah.

*Carl Lanore:* And there's the group out there that says you know heavier loads and the group that says higher reps and the reality is that it can be either if you stimulate a phenomenon which I can only use the word "muscular congestion." Depending on when you were able – where in that dynamic of exercise that your performing whether it's heavy weight or higher reps, you know lower reps with heavy weights or higher reps with lighter weight, if the muscles getting congested that is where it appears that the intramuscular growth factors and switches that seem to be exploited by Kaatsu really say, "Look this is what builds muscle. It doesn't matter if you're using heavy weight with low reps, it doesn't matter if you're using light weight with high reps, what matters is that this condition is occurring in the muscle." Am I off base on that?

*Dr. Stray-Gundersen:* No. I would just kind of phrase it a little differently. I would say that what Kaatsu does is it impedes the blood flow out of the muscle such that the muscle when it's exercising it can't get its normal recovery that blood flow allows. And because it can't recover a profound disturbance of homeostasis is induced in this muscle. This disturbance of homeostasis and I know that's a little bit of a mouthful, but this disturbance of homeostasis is when for example the oxygen levels in the muscles go down or the pH does down, which means that the environment is becoming more acidic or various electrolyte gradients are coming out of spec if you will and there is a variety of these things that happen when a muscle is exercising and it can't get recovered.

This contraction becomes unsustainable and then that unsustainable contraction sends a signal up into the brain saying, "Holy mackerel guys you got to help me out here." We're aware of that feeling cortically by a hard effort or a feelings of fatigue or feelings of congestion and a variety of these things such that we end up sending the brain this signal. It's usually only in both cases like you know 20-miles out on a long run or by lifting 300-pounds squats and doing that kind of thing where you'd get to these situations where the disturbance of the homeostasis in the muscle has been so profound that these kind of messages to the brain are screaming out for help.

Then the brain responds by an outpouring of a hormonal milieu that maybe milieu that may be best illustrated by increases in growth hormone or profound increases in growth hormone from this exercise. Then that healing anabolic hormonal response out of the brain is then responsible for all this rebuilding process and healing process and then we go from there. Under normal circumstances whether it's with the marathon or whether it's Olympic weightlifting that muscle has been damaged by this stuff. But in the case of Kaatsu we haven't damaged the muscle, we've just fooled the brain into thinking all hell was breaking loose.

*Carl Lanore:* Aaaaah interesting.

*Dr. Stray-Gundersen:* Okay? And so then you adapt – instead of having to dig yourself out of this hole you just can start increasing strength and fitness right off the bat.

*Carl Lanore:* Oh man okay so two things that jump out of me big time here that I did not understand and this is really great stuff. You're right because we talk about the net synthetic response of exercise in building muscle and we know that if damage is negative 10 and growth is positive 12, you have a net influence of 2 on the growth of muscle. What you're saying is damage is zero, so whatever the growth impetus is that is a positive X whatever that is.

*Dr. Stray-Gundersen:* Right.

*Carl Lanore:* So you're really building on a foundation of already ready to grow muscle as opposed to previously damaged muscle.

*Dr. Stray-Gundersen:* Exactly. So we've altered the balance. We've really decreased those negative stimuli to a minimum and we've maximized because this is a maximal signal, we've maximized adaption healing response. And so you know you just tilted the teeter-totter and all of a sudden you know off you go getting stronger and fitter right off the bat and you've done it with really low weights.

*Carl Lanore:* Okay.

*Dr. Stray-Gundersen:* So anybody can do it.

*Carl Lanore:* Okay now wait a minute because we're going to get into the weight loads in a second. Now the other misunderstanding I've been under is that the increase in growth factors, mechano growth factor which I think is IGFE or 1E or something like that, all these things

happen in the muscle exclusively than systemically. Am I incorrect? Is it just being what's the word I'm looking for, trapped and concentrated in the muscle, but it's actually produced systemically?

*Dr. Stray-Gundersen:* Well there's a couple of things, there's both local effects and systemic effects.

*Carl Lanore:* Okay.

*Dr. Stray-Gundersen:* So imagine we have a muscle exercising and it's blood flow is not a happy camper, it can't recover the muscle as well as it would like too. So then there are various sort of near-term hormones that are in the tissue itself or in the surrounding tissue that end up sending signals that do a variety of things. Like they essentially try to repair this damage that's being done. There's various cytokines that are locally released that do things like turn on protein metabolism, they prepare cell-surface receptors such that they will be responsive to any systemic hormones that are coming along. Those sorts of things are all done at a local level.

Then because this signal of this disturbance of homeostasis has been sent up into the brain it has caused among other things the pituitary to release a lot of growth hormone. This growth hormone then goes among other places to the liver where it stimulates the production of IGF-1. Then IGF-1 then goes out throughout the whole the whole circulation. It then where there are cell receptors that have been up-regulated or turned-on such that they will be receptive to these anabolic stimuli, then those tissues that have been exercised end up further amplifying their production of proteins and trying to repair what damage was done. The nice little thing about this is that the damage wasn't done, we just fooled the brain into thinking it was.

*Carl Lanore:* This is brilliant. Then obviously the brain gets – the body gets to work in super compensating and preparing for the possibility of another one of these muscular onslaughts and it increases the muscle size and we're going to talk about obviously it influences hypertrophy, but we're going to talk about strength in a second.

I want to take a break.

*Dr. Stray-Gundersen:* Okay.

*[Music]*

*Carl Lanore:* You know everybody talked about work smarter not harder. Lee Haney used to say, "Stimulate, don't annihilate."

*Dr. Stray-Gundersen:* There you go.

*Carl Lanore:* It sounds to me like Kaatsu is the gold standard for those who want to work smarter not harder. But let's talk about two things when we come out of the break. Let's talk about the load, because what I see people doing with Kaatsu is instead of using a light weight they use heavier and heavier weights and try to bridge the strength and muscle hypertrophy gap.

*Dr. Stray-Gundersen:* Yeah, don't need too. [*Chuckles*]

*Carl Lanore:* But also I want to talk about what Kaatsu is not good for, if there is anything and then we will talk more about training styles.

In the meantime if you're anxious to get information you can go to the website [kaatsu-global.com](http://kaatsu-global.com). I'm going to spell it for you, it's: K-A-A-T-S-U hyphen or dash depending on what part of the country you're from, [global.com](http://global.com). They're giving away a free four megabyte report on lots of the things that we're talking about here. You need to go there and get that.

We talk about advanced training techniques like statics and negatives. There may not be anything more advanced than Kaatsu, but you have to understand how to use it, because like all things that really work it can backfire on you too and we'll talk about that in the show too.

We're talking about Kaatsu training right now with Dr. James Stray-Gundersen. I have to thank a listener from Budapest, Hungary for putting this show together today and that's Peter Lakatos.

A lot of the things that we're talking about here today if you want to get a little deeper into it you can go to the website, [kaatsu-global](http://kaatsu-global.com): K-A-A-T-S-U hyphen G-L-O-B-A-L.com and download their report and obviously communicate with them there if you want to try to adapt this to your own training.

So first things first the weights that people use must it be light weight or is there an advantage to doing some sort of progressive loading when you're doing Kaatsu?

*Dr. Stray-Gundersen:* Yeah Carl this is really an important point. We're paradigm shifting here. We're thinking about using impeded blood flow or modified blood flow plus low weights, light weights, easy weights to send this signal to the brain. So we're using the muscles that are you know normally when we think about training we think about we're training the muscles that we're exercising. This is we're using the muscles that are being exercised in **contute** to send this signal that causes the whole body to adapt.

So one of the things about in terms of the loads we absolutely don't want to use heavy loads because that ends-up becoming a combination of modifying the blood flow and using heavy weights can produce damage to the muscle fibers. So we always want to stay on the side where we're doing really light weights like you know two-pounds arm curls or we can do things with partial body weight like push-ups or –

*Carl Lanore:* Yeah I was just going to say that. It sounds to me like if you want to do Kaatsu look a lot of us going to the gym with our training buddy, his name is Ego and the last thing we want to do is grab a pair of two-pound dumbbells and have 19-inch arms and people go, "What's that about?"

You know when I was a kid there were guys in the neighborhood that would buy a Camaro, put a Phase 3 hood on it, put Mickey Thompson 50-Series tires on the back, put you know traction bars on it and they had a four cylinder or a six cylinder and we used to call that a "pig."

*Dr. Stray-Gundersen:* [Laughs]

*Carl Lanore:* So you know a lot of us guys we have an ego, we're going to go in and lift heavy. It sounds to me that Kaatsu would best suited for bodyweight training.

*Dr. Stray-Gundersen:* Yes it is. So you can do all the Kaatsu exercises and you can get a really good Kaatsu effect without any additional weights or devices or anything. Now that's not to say that we're going to have to throw out all the weight racks we have at home. The idea is that particularly for strength-oriented sports, let's say alpine skiing or Olympic lifting or football or these sorts of things where strength is critical and let's say standard weight training has always been part and parcel of getting fit for those sports.

What we do or what we recommend at the U.S. Ski Team where I'm working is that we have the athletes do 90 percent of their normal weight workout. So to induce a little fatigue but they save the riskier lifts to trying for Kaatsu. So we don't want anybody doing maximal squats or these bench presses where they might drop the weight, where they might hurt their back or that kind of thing, but we do all the other stuff.

Then after that workout then they come in and they do a Kaatsu session. That really polishes it off, because now the muscles are already fatigued, it's already giving them a little bit of a signal and then we hammer it with this Kaatsu program that really takes it over the edge, but does so safely. There's no heavy weights involved. We're able to get people where they just can't do one more pushup. So then what we're doing is we're getting the traditional training plus we're getting what I think of as frosting on the cake by doing that Kaatsu session.

*Carl Lanore:* Okay so the traditional training is going to influence neuromuscular adaptation which gives us strength and instead of doing some you know other type of 20-rep scheme thing just do a Kaatsu movement at the end to kind of influence hypertrophy.

*Dr. Stray-Gundersen:* Yeah. One of the things to think about is you know in various forms of training whether it's strength training or endurance training or all of these things you know there's not that many times in a week where you can really take it to max.

*Carl Lanore:* Right.

*Dr. Stray-Gundersen:* And what Kaatsu does is again frosting on the cake of all of the other training that's been going on and you just back-off that training just a little bit and you let the Kaatsu session end up being those maximal workouts. And because you're not getting the damage that's normally associated with it then for one thing you recover a lot quicker and you're ready to go the next day. You can actually add on more maximal sessions a week than you otherwise could.

All this stuff going back to that initial thing you were talking about where we're shifting the balance between the negative effects of training and the positive effects of training. And so what we're doing is we're cutting down on the negative effects, adding onto the positive effects, getting a more robust adaptation and fitter and stronger and faster and everything.



*Carl Lanore:* Okay. So real quick we just got this in from Kaatsu Global Headquarters.

*Dr. Stray-Gundersen:* Oh.

*Carl Lanore:* Those of you listening to the show if you want to take advantage of any of the offerings that kaatsu-global.com, which is: K-A-A-T-S-U hyphen global.com, you can take advantage of all of those things and get a ten percent discount by using, by mentioning "Super Human Radio" when you go there and order and/or checkout you'll save ten percent. This is only good for 30 days. So today is October 12th, so if you're listening to this and it's way longer than that the offer is probably gone but check that out.

I want to take a quick commercial break. When we come back I want to talk a little bit about, I just lost my train of thought I'm sorry about that. I want to talk a little bit about the way that you occlude and how critical this is. I know the original studies they were using blood pressure cuffs so they could actually measure in milligrams of mercury just how much pressure was being applied.

Today guys go into gym and literally tie ropes around their upper arms that have no give whatsoever and are choking the muscle up. There's a big difference between doing this right and doing this wrong. Can we talk about that when we come back from the break?

*Dr. Stray-Gundersen:* Absolutely.

*Carl Lanore:* We're talking with Dr. James Stray-Gundersen. We're talking about Kaatsu training. This is the definitive interview on Kaatsu training because there's lot of misinformation out there.

*Dr. Stray-Gundersen:* Absolutely.

*Carl Lanore:* Yeah there is and it's not one of those things that if you get bad information you just won't grow, you can actually hurt yourself. One of the things that people need to be careful about is the level of occlusion or restriction and there's differences in that terminology in the science. Then what they consider vascular occlusion and vascular restriction are vastly different. One seems to still have some compensatory blood flow in-and-out of the muscle. The other seems to stop it completely. How do people

determine how far to go or is that something that you offer at the website? Do you offer the actual cuffs and how to use them?

*Dr. Stray-Gundersen:* Yeah Carl these are great questions. Let me take a moment and kind of describe some of the history here. Dr. Sato really invented Kaatsu training in 1966 or that was when he had a little epiphany about how to do this. He then took about 30 years of tying bicycle tires around his arms, judo belts, what have you and kind of learned the hard way and from experience how to do this stuff right.

At the same time kind of little bits of these secrets were leaking out of Japan and into primarily the bodybuilding world and a number of other things. While Dr. Sato really didn't explain himself well a lot of these other people saw what he was doing or at least at the time. Then they had big ideas about what they thought he was doing and went and tried a bunch of stuff for themselves.

So if you think of this area of blood flow restriction as one big thing around the world and there's our whole variety of things that kind of come into that circle, Kaatsu is a subset of that. It's really only safe and only really effective when it's done the way Dr. Sato says. So there's a variety of protocols that are very important in terms of how you get these things done right and done safely.

So for example that is the primary reason why we have basically these instruments that allow us to very carefully judge what the right amount of impediment of blood flow is or the right amount of modification.

There's another aspect to this. So the way that we use these bands or the stuff that goes around the arms and the legs is that there's an air bladder in there and this air bladder we can very finely change what the pressure is in there. And what we do then is we kind of go through a set of pressures where we then check to see whether we're seeing the right kind of physical signs that we have not occluded, but that we have impeded blood flow such that the exercises that will be done will produce problems or not problems but failure, fatigue, send a signal up into the brain.

*Carl Lanore:* Okay.

*Dr. Stray-Gundersen:* So it's very critical the two big things and this is one of the things that the Kaatsu protocols are very good for is that we absolutely don't want to occlude. If we do occlude that's the thing that can

lead to severe muscle damage or sometimes blood clots or a variety of other complications. Usually pretty much everywhere where we've seen these kind of complications it's because people are either not even doing Kaatsu at all or they're doing it incorrectly. So what is critical is getting the right equipment, getting the right education, and then doing this and applying it in the right way.

*Carl Lanore:* Now there are people out there who are going to try it obviously and they're not going to want to buy things to try it.

*Dr. Stray-Gundersen:* Right.

*Carl Lanore:* Is there kind of a rule of thumb that look if the muscle is occluded and you're going to feel this severe pump, you're going to feel this accumulation of lactate build up rather quickly, is it kind of like something that we say, "Look if you're starting to fail and feel these things in the first couple reps you're too tight. You're shooting for a 10 to 15 rep where you start to experience this." Is there anything that we can give some safe advice on that or is it something that they must follow exactly what you offer at the website?

*Dr. Stray-Gundersen:* Yeah it's very difficult –

*Carl Lanore:* I know you're probably reluctant, I know you're reluctant to give that kind of broad scope statement being within the medical but you know.

*Dr. Stray-Gundersen:* No, no I think I can address it to some extent. What I would say is that it's not easy to get to the right level of blood flow modification without using the devices.

*Carl Lanore:* Yeah.

*Dr. Stray-Gundersen:* So what happens and believe me Dr. Sato has tried over the years to do this in a way where it's just a matter of throwing on some belts and he's come to the conclusion that you need to have this education and you need to have the equipment to make it work right.

*Carl Lanore:* Right.

*Dr. Stray-Gundersen:* Now so and most of the time or I should say all of the time when we're figuring out where it is that somebody needs to have these

pressures we're taking it a step at a time, we're undershooting in the first place and then we're checking things and then sometimes you have to do sets of exercises to see if you get this fatigue or failure in the proper number of reps. So standard Kaatsu exercises end-up being usually three sets of the same exercise and usually we go about 25-to-30 reps in the first set, 20-to-30 second pause, then usually it ends-up producing failure in 20-to-25 reps on the second set, again a 30-second pause and then usually failure comes pretty quick in the 15-to-20 rep range. That's when you know you have it just right. It means that you put the bands on in such a way and the pressures are set in such a way that you get failure in the period of those sets with very light weights or something like pushups or just getting up and out of a chair.

*Carl Lanore:* Okay, okay. Now are there any muscles that are not good candidates because of where they are, because of kinesiology, because of where the blood flow comes from, that are not good candidates for Kaatsu?

*Dr. Stray-Gundersen:* Well this is one of the unique things about Kaatsu. So one of the things it is a critical step so you know if there is one thing to say never occlude. The next thing to say is always put the bands in the correct places, which is kind of just below the deltoid and just above the bicep on the arms and pretty much high up on the legs as far as you can go. That then produces this impediment of blood flow for all of the muscles that are distal to these bands.

So when that happens then were using as many muscles as possible to get that signal up into the brain to produce that systemic effect. However, all muscles that are getting exercise those muscles their cell-service receptors get turned on and everything else and so they're receptive to this systemic hormonal anabolic response that's coming down the line. So what happens is we make a point of we want to exercise the muscles so that we get that fatigue signal that had their blood flow impeded, but we also want to exercise other muscles that are involved in any of these exercises.

So for example like if we want to get glutes firing their blood flow is just perfectly fine, but the hamstrings and the guads they're blood flow is impeded. So we want to setup a situation where we're getting exercise in all these muscles and even though the glutes don't have their blood flow impeded they're still getting the benefit. Same with also –

*Carl Lanore:* But wait a minute, but wait a minute, but technically they do and just stay with me because I'm obviously not up on this, but when I used to use some form of Kaatsu for my upper arms what I also found was that while the blood flow is being restricted in my biceps and triceps predominately and obviously the forearms because they're downstream.

*Dr. Stray-Gundersen:* Right.

*Carl Lanore:* But the muscles upstream are also experiencing some form of occlusion in the way that the blood that normally passes through them is kind of being trapped backed-up. It's kind of like look when you clog a drain nothing on either side of the clog works very well, so my pecs used to get a really good pump and my shoulders used to get a really good pump when I was focusing on my biceps and triceps.

*Dr. Stray-Gundersen:* Yeah. You're absolutely right, your pecs and your deltoids and your shoulder muscles are all getting a really good influence, but their blood flow is just fine thank you very much.

*Carl Lanore:* Okay.

*Dr. Stray-Gundersen:* And so here's one of the things. So let's say that we're going to do a bench press or let's say we're going to try to do a pushup. Let's say it's a pushup, you're using your forearm muscles, you're using your biceps, mainly you're using your triceps, but you're also using your pecs. So the pecs their blood flows happy camper, but the triceps they're the weak spot because they're blood flow impeded and they're starting to fail and they're sending a signal to the brain saying, "Hey guys I'm failing. I need to have a better percentage of my maximal ability to go forward." And the brain then says, "Okay well we got to really whip that horse and get those pushups going so we'll send out a signal to all of the muscles involved in the activity to work harder." And so those pecs are getting the same kind of whip if you will that the triceps are and even though they don't really need it. So then you end up getting this exercise benefit for the pecs as well as the triceps and everything else.

*Carl Lanore:* So the reality is in order to achieve the proper what's the word I'm looking for, not occlusion but, ah, um, isn't this funny I just forgot my own – I got lost. But the bottom line is that in order to get the proper affects from this you really to just be able to get high up on the thighs where they attach into the groin area and between the tri and the upper arms below the shoulder muscles, that's it, that's

everything. So you don't have to worry about occluding pectoral muscles or anything else.

*Dr. Stray-Gundersen:* Right. So point number one, get the bands in the right place. Point number two, modify the pressure and do little tests so that you have the proper amount of blood flow impediment and never occlude. Then point number three is use simple, easy weights, simple movements to get those muscles to fatigue and send that signal up into the brain that then releases the hormonal response.

*Carl Lanore:* Okay.

*Dr. Stray-Gundersen:* And it's really that safe and that simple if you do it that way and you know so you know there's tons of people that think that one's good, ten is better, well all that stuff is not the way to do Kaatsu.

*Carl Lanore:* Okay. So now we're going to take a commercial break and I have some questions I've always wanted to ask about certain supplements and their influence on the results of Kaatsu and hopefully you'll have some opinions and perspectives on this.

We're talking right now with Dr. James, I'm sorry, Stray-Gundersen and the website is kaatsu-global: K-A-A-T-S-U hyphen global.com. If you go there and you place an order, well first of all you get a free report there, number one, so go and get that, but if you do want to buy some of the bands and items they offer if you mention this radio show, Super Human Radio, you'll get a ten percent discount. This is good through for 30 days, so it's October 12th today if you're listening to this show late, if it's 30 days after that that coupon code is no longer available.

We're talking with Dr. James Stray-Gundersen. We're talking about Kaatsu training. If you are a personal trainer and you want to add the certification and the equipment to your repertoire of offerings you need to go to kaatsu-global.com: K-A-A-T-S-U hyphen global.com. This is a very, very serious science here. This is not where you put some ropes or bands around your client's arm.

The equipment gives read-back, it gives feedback and it explains what you're doing right, what you're doing wrong. It allows you to guide – you know and this is something really not just for the average person, but for those professionals out there who are bodybuilders who want to try to take their body to a different level that they just can't get with the type of training they're doing now. I

have a feeling that Kaatsu will open amazing opportunities for growth in those individuals.

So real quick two topics I want to cover and then we can wrap it up with whatever else you want to talk about. Certain supplements seem to influence this phenomenon either in a positive or negative aspect I'm thinking. I don't know if this is true that's why I'm asking you.

Beta-alanine has been shown to quench hydrogen ions, allowing endurance athletes to train longer without the burn so to speak, the lactate buildup. Would that be a non-starter, a not a good supplement to use if you're looking to use Kaatsu?

*Dr. Stray-Gundersen:* No, I think beta-alanine would be great. You know let's take nutrition as a kind of general topic. I know there's lot more here. But I think the way that nutrition, whatever nutrition the person is applying that Kaatsu just amplifies the effect of this. So if the nutrition is intended to build big muscle then that's what's going to happen with the combination of the nutrition that's going in and the other training that's going on, as well as that Kaatsu frosting if you will.

If it's an endurance thing then that connotes a certain kind of diet and then also a certain kind of other training and then Kaatsu can amplify those sorts of things. So for example it's been shown that muscle that gets built with kind of endurance-type training ends up having the characteristics of that kind of muscle all the time. You know the athletes don't necessarily gain any weight. In sports where you don't want to gain weight you can use Kaatsu in a way that combined with your nutrition and your exercise such that you don't, you don't gain weight. Where on the other hand bodybuilders or other strength kind of athletes they want to gain weight, so then their nutrition dictates kind of the way that this goes.

Now one of the things back to beta-alanine specifically just the idea that you have good intracellular buffers is still a good thing, it's just mean that the degree of impeding of blood flow needs to be a little bit greater than it otherwise would be. This is where we see these kind of things. So after you get done with your Kaatsu session and you've done let's say three to five different exercises and you've gotten that failure signal at least in the third set of each one of those exercises, then in retrospect you know you did a good job. Whether you have beta-alanine onboard, whether you don't, whether you are using creatinine or all those sorts of things they

just set the stage for the muscle to adapt in a better way to a stronger stimulus.

*Carl Lanore:* Okay good because then you answered the question about a nitric oxide donor as well like you know L-arginine or something like that.

*Dr. Stray-Gundersen:* Yeah right.

*Carl Lanore:* Okay. What about strength? Is there any evidence that Kaatsu training actually effects neuromuscular adaptation in the same way that handling heavy weight does?

*Dr. Stray-Gundersen:* Well I'd kind of answer it this way, you know one of the things is you get increases in strength with Kaatsu within two weeks. I would say that most people think that that's just because we've gotten better motor activation, better coordination and we really haven't done anything to the muscle itself. But that's not the case. We do get those enhancements of the motor coordination and all that kind of stuff, but we're still getting protein building going on in the muscle and as I was kind of alluding to earlier that because we haven't done the damage we don't have to dig ourselves out of this hole that takes you know four-to-six weeks.

*Carl Lanore:* Right.

*Dr. Stray-Gundersen:* We can just start going right from get-go. So I would say that the degree of skill acquisition and all those sort of things is the same with Kaatsu as it is with other sorts of sports or other sorts of weightlifting.

Now let me illustrate one thing is one of the things that I love doing with all of my athletes is I ask them to put the Kaatsu bands on and then they have to try to do some skill activity that they may have been doing. For example juggling a soccer ball or throwing a baseball or hitting a baseball, all these things that are highly technically oriented and with the Kaatsu bands on at the right pressures they're just horrible at it.

That does a couple of things. One is these are already well accomplished people and they don't like not being good at what they're sport is and so it forces them to focus on the very specific motor tasks that are involved. Then because they renewed their focus on these activities, plus their muscles are getting more fatigued than they otherwise would they get a really robust



response. And very shortly they're on one hand juggling soccer balls really well again with the Kaatsu bands on and then on the pitch they're even better than they were before.

*Carl Lanore:* And so then when they take the bands off since they've had to focus more and get more neuromuscular inroads and control with the bands on when they take them off they're actually even better than they were before.

*Dr. Stray-Gundersen:* Exactly. So here's the thing, one of the things that is a critical component of all sports is when fatigue sets in you still have to do things and in exactly the right way whether that's catch that football or hit that jump shot or score that goal, all these things are very critical, technical things that are not done well when the individual is fatigued. Kaatsu teaches you to operate under those conditions of fatigue so that you then do those things better when you don't have the Kaatsu bands on.

*Carl Lanore:* We only have a few minutes. Are there any contraindications that someone should not get into Kaatsu? Like let's say they've been diagnosed with peripheral artery disease and they don't want to put bands on their lower legs am I right about that or no?

*Dr. Stray-Gundersen:* The short answer is there's pretty much no contraindications to Kaatsu. There's a couple of situations where we take extra care. One example for example is a woman who's had breast cancer and has had the lymph nodes in her armpit removed or the lymph nodes have been radiated, which produces a situation where generally they're advised not to put blood pressure cuffs on their arms or get blood drawn on that side. We similarly with an abundance of caution try not to put the bands on that arm. But the other three extremities they're still good to go for Kaatsu.

*Carl Lanore:* Right.

*Dr. Stray-Gundersen:* That ends up being just fine.

*Carl Lanore:* Oh yeah because there's actually a cross-education. We know that if you train one leg, the other leg gets something out of it anyway, so there's probably some real benefits to that.

*Dr. Stray-Gundersen:* Exactly.

*Carl Lanore:* Yeah, yeah.

*Dr. Stray-Gundersen:* Exactly. So you know there are things and this is part of the educational process, there are things where we have to modify exactly what we do and we don't do, but suffice it to say that there's a way to Kaatsu everybody in a safe manner.

So for example you were talking about the peripheral artery disease in let's say a senior for example. There we're not going to use very high pressures, but we don't need too because we can end-up getting that Kaatsu effect with a combination of low pressures and easy exercises that work for them and doing so such that we don't damage any arteries that are already diseased.

*Carl Lanore:* I have to believe that the hemodynamic changes would actually be beneficial to arteries because we know that heavy load-bearing exercise over long periods of time actually makes arteries and veins more resilient, more elastic, and improves intima, thickness, and function. So I got to believe that allowing them to achieve that level of let's say almost what occurs in a Valsalva-type of a maneuver, achieve that kind of blood vascular pressure changes, but without doing a lot of strenuous work has to be beneficial to them.

*Dr. Stray-Gundersen:* Absolutely. Again this gets back to that key to Kaatsu which is when it's done properly there's low loads involved. You don't have to go to the extremes that you normally have to go to to get the effects to happen.

*Carl Lanore:* Yeah. Listen we've run out of time. This is a fantastic interview. We're happy to have Dr. Gundersen back on the air. If you have questions that we didn't cover please e-mail them to [onair@superhumanradio.com](mailto:onair@superhumanradio.com) and I promise we'll have him back on and cover it at a later time.

This is brilliant and the website is fantastic,  
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It's K-A-A-T-S-U dash global.com.

Whether you are an end user or you are a personal trainer you must go to that website. Download the free report, but more importantly checkout the equipment, get certified and offer Kaatsu training to your clients, it's a great idea.

Listen, thanks for being on the show today Dr. Gundersen.

*Dr. Stray-Gundersen:* Oh, you're more than welcome.

*Carl Lanore:* Take care.

*[End of Audio]*