Live Q&A with Dr. Doug McGuff – Peptides, Training Clients with Heart and Other Health Issues, and More (JULY 2024)

Lawrence Neal: All Right. excellent. Look, thanks for making the time, Doug. Really appreciate it.

Welcome to everyone today for the Membership Q&A or the monthly Masterclass for July 2024. We do this every single month. At least we try to, and we tend to alternate between HIT business topics and personal training to make sure we're tackling both sides of the business.

Previous guests include Luke Carlson, who most of you will know Jeff Tomaszewski, Pete Cerqua, Hannah Johnson from Discover Strength, Dr. James Fisher, and many more.

Today's expert is the co-author of Body by Science, ER physician, and owner of Ultimate Exercise, **Dr. Doug McGuff**, who really needs no introduction, but there you go anyway.

Doug, welcome, thanks for being here, really appreciate it.

Dr Doug McGuff: Yeah, thank you. Fun to be here.

Lawrence Neal: Yeah, it's been a while since we've spoken, so it's always good to talk to you. And we're just going to really do Q&A, so I've got questions like the guys submitted, but I think it's better if attendees actually ask you questions live because there's always nuance and they can follow up with another question, right?

If it's a client or something like that. Does that sound good?

Dr Doug McGuff: Yeah, let's go. We've wasted enough time with technical issues.

Lawrence Neal: Yeah, it sounds good. And my wasteful introduction. If anyone wants to raise a hand and ask a question and I will unmute you. Nice one, Bryce. Here we go. So, there you go, Bryce. So, unmute yourself and the floor is yours.

You're on mute, Bryce, so I wanna check your audio.

Bryce Lee: Hey, how's that?

Lawrence Neal: There you go. Perfect.

Bryce Lee: Hey Doug, great to talk to you. I'm wondering if you've gone down the peptide rabbit hole at all, people take peptides to accelerate recovery, injury, healing, all that kind of stuff.

Is that something that you know, to your mind seems like, mostly BS and hype? Or do you think there's anything to that? Have you looked at that at all?

Dr Doug McGuff: I've not looked at it in depth. I do think there probably is something to it. But like any medication that has a therapeutic effect, the side effects from that are going to be proportionate to the therapeutic effects.

I cannot comment on specific ones, but in particular, the ones that tend to augment growth hormone.

You also, as a consequence of the benefit of the therapeutic effect, might experience some of the side effects of growth hormone augmentation, and that can be disruptions in sleep architecture. It can be development of carpal tunnel syndrome. It can be development of some hypertension.

In any of these agents, to the extent that they have a therapeutic effect, there have to be side effects that have to be weighed against, and there are plenty of clinics that will prescribe you and give you whatever you want.

But I think if you're going to do it, I would really try to seek out a reputable practitioner that really considers the risks and benefits to do it.

Bryce Lee: Yeah, that's helpful. Thanks, Doug. It's a good heuristic to think about it, too.

Lawrence Neal: Great. Bryce, let me know if you've got any follow ups. Guys you're welcome to raise a hand if you've got a question, and I can unmute you.

If no one raises a hand, I will go through some of the questions that have been submitted, or you can type your question as well. James Brown.

James Brown: Hi. Can you hear me?

Lawrence Neal: Yeah.

James Brown: Oh, hi, Doug. Great to meet you online. Thanks for doing this. Yeah, I submitted this question, but I guess I'll try and ask you in person.

I'm very my clientele are older 65, average, so plenty are older than that. And of course they have some heart conditions. So, I just wonder, if you can speak from your experience of training people with the most common heart conditions, what allowances do you – should you – or do you need to make for the way that we train them?

Dr Doug McGuff: Yeah, there are a whole myriad of different heart conditions that might need to be taken into consideration. And again, it's going to depend on the specific heart condition and the limitations imposed by their position.

But just off the top of my head, there are plenty of clients that you're going to have that have chronic atrial fibrillation. As a consequence, most of them are going to be on blood thinning medications, which doesn't really have much bearing. But also, they're usually on rate-controlling medications, something that does not allow every beat coming from the top of the heart to transmit down to the bottom of the heart so that their heart rate is controlled.

But the flip side of that is that also blunts their tachycardic response to exercise. So, they cannot augment their cardiac output as much by elevating heart rate. They have to rely on stroke volume as a consequence. The only thing that really needs to change in that circumstance is the pace of their workout. And I would just allow for them to have a rest interval between sets to allow them to recover in a respiratory fashion adequately. And that's the only adjustment you need to make.

For most people that have hypertension, I don't concern myself too much with that, unless that it's really unstable or really uncontrolled. But people on medication to control hypertension, generally the literature tends to support that both during training and the period of time after training systemic vascular resistance, the arterial tone that the heart has to pump against is actually decreased because the augmentation and cardiac output during exercise, there is a very modest increase in blood pressure.

But post-exercise, there's actually a decrease, and the long-term effect of training is actually to decrease blood pressure to the extent that you'll find a lot of your clients that are on blood pressure medications over time require a decreased dosage of that medication or sometimes discontinuation of it.

There are other clients that have cardiac valvular issues like mitral regurgitation or aortic regurgitation. Those are usually well compensated for by the heart spontaneously. So, unless they have specific restrictions to not exercise, I think you can just do them to the limits of their tolerance.

The only thing I would say are real cautions are people that have aortic stenosis, which is a narrowing of the aortic outflow tract. Those people may have a hard time meeting the demands of exercise, and that should be cleared by a physician.

People with thoracic aortic aneurysms above a certain threshold of size need clearance from their physician. Usually that's in the realm of around 5-centimeters.

So, there's, lots of different considerations and you have to sometimes just bite the bullet and be in contact with their physician to get clearance. But the vast majority of cardiovascular conditions only benefit from resistance exercise and really just require some adjustment on the fly, which is relatively minor.

James Brown: Fab. Great answer, Doug. Thanks for that. And just to clarify the first answer on the atrial fibrillation, is it the medication which tones down the tachycardic response?

Dr Doug McGuff: Yes. What medication fibrillation is you normally have one pacemaker up in the top chamber of your heart that kind of runs the show.

But in atrial fibrillation, usually because the atria has gotten a little big and floppy, you'll have multiple little areas that try to pretend like they're the pacemaker and the bottom chambers of the heart don't know which one to listen to. So, they listen to them all, so heart rate elevates too high sometimes in the 130-150 range, so they're put on medication to blunt how much gets transmitted from above to control heart rate.

And that works well, but the issue is that under normal circumstances under demands for cardiac output, a client's going to raise their heart rate from 80-140 during the course of the workout, but this medication may blunt their ability to go that high — they may be able to only elevate their heart rate to 100 or 110. So that may have some effects on their recovery between bouts. It may have to be paced just a little bit slower. But you can adjust that on the fly. Sometimes it's not an issue at all. But it's just something to think about.

James Brown: Yeah, brilliant. Thank you.

Lawrence Neal: Anyone else got a question? James, I know you have more. Unless someone else has a question or wants to raise a hand… I'll give you three seconds.

James Brown: I'm ready with another one.

Lawrence Neal: Yeah, I let Bryce go because he just got there in time. All right, here we go.

James Brown: All right.

Bryce Lee: Yeah. If you guys can hear me, just a follow up on that discussion is, how much of the heart rate elevation that we're seeing during this kind of exercise that we do is really more of a sympathetic stress response versus actually being driven by a demand for oxygen, a surplus of CO2? That kind of thing. What do you think about that?

Dr Doug McGuff: Yeah, I think that high intensity resistance exercise, as you're have that closing window between your ever decreasing strength and the weight that you selected. I think that the majority of the tachycardic response probably is sympathetic-driven, because in order to meet the demand of that kind of muscular recruitment and the cleavage of glycogen to drive that process.

That is a very adrenergic process. You're just generally generating a lot of effort and noradrenaline to drive that process. So, I think in a *chicken-or-the-egg* fashion, I think it's the sympathetic drive that is necessary for that degree of muscular work to occur, which drives the tachycardia then somewhat contributes to the augmentation of cardiac output, but also the intense muscular contractions, milking venous blood back for the heart is really augmenting the stroke volume disproportionately.

So, the reliance on tachycardia as opposed to lower intensity or more aerobic type exercise is less dramatic. From both sides of the equation, the tachycardia is more related to the sympathetic drive than the necessary demands for increasing cardiac output.

Lawrence Neal: Awesome. Thank you, Doug. And thank you, Bryce, for the question. We're going to switch back over to James, unless you got a follow up on that, Bryce, if you want clarity.

Bryce Lee: I guess the way I think about it is, for a long time, I thought that just getting really winded and out of breath from high-intensity training was serving as an adequate sort of cardiovascular stimulus.

In addition to strengthening stimulus – and since then I've started to wonder – is a lot of that hyperventilation and elevated heart rate more due to that sympathetic drive? And if so, is it not actually giving me all of the benefits that more traditional cardiovascular conditioning would, obviously, there's specific adaptation?

That's a thought. That's all.

Dr Doug McGuff: Yeah, I would agree with that in that… so the offloading of CO_2 is a result of the sympathetic drive ramping glycolysis really fast.

So, you're metabolizing glucose down the pyruvate at a really rapid rate, right? Or shuttling pyruvate into the mitochondria at a maximal rate, which is going to generate CO_2 and water, which you're blowing off with the hyperventilation that is all sympathetically driven.

The interesting thing is more with all the praise lately about Zone 2 training and aerobic-based exercise. That is a form of exercise that has a much higher vagal tone to it. So, it's a different approach to get at augmenting mitochondrial function and respiration.

I would say that the cardiovascular conditioning that you're looking for or that we're talking about in this circumstance really is not happening during the bout of exercise, during the bout of high-intensity exercise.

But I do believe that the effect that you're looking for over the course of the next few hours as you're paying back that debt and reshuttling pyruvate a reshuttling lactate and paying back that debt actually is on that arm of the cardiovascular adaptation.

I think the cardiovascular adaptation that is more vagal and more what we think of when we think traditionally of aerobic-based training is what is occurring during the payback period, but not during the exercise period.

The question that everyone's going to have to struggle with is, “Do we need to have some sort of background of lower intensity exercise?” in order to address the side of the exercise adaptation that this really does not do?

My general inclination is *probably,* but it does not have to be a regimented sort of thing that if you're otherwise physically active in your life if you're hitting close to that 10,000 steps a day and accumulated activity.

The other thing that tends to rise with muscular conditioning is non-exercise activity thermogenesis, just simply being more active. My gut is that probably fits the bill, and you don't have to invoke a secondary exercise program from a regimented standpoint to address that, unless the person is otherwise just completely sedentary.

And we do have some clients like that are like busy, desk-bound professionals. And the only thing that they do is get up out of their chair and come to our studio once or twice a week and then nothing else. Those people may need some sort of outside augmentation, but they're otherwise physically active.

Probably not is my assessment.

Bryce Lee: Thanks, Doug.

Lawrence Neal: Thank you both. All right. So, James, going to hop back over to you. Obviously, anyone else got a question, please raise your hand and we'll allow you to speak.

James Brown: Thanks Lawrence. So, I've got some clients with osteopenia and osteoporosis, and I'm obviously the main thing I observe is not giving them an ab crunch. Don't do spinal flexion. But I was wondering, is it safe to train them to train the front of the torso, the anterior of the torso in a static fashion, or does that present the same risk and any other thoughts you have on training people with osteoporosis?

Greatly appreciated.

Dr Doug McGuff: Yeah, I think it's probably safe to train them even in some degree of spinal flexion as long as it's not overdone. Now, if you got them on a MedX lumbar extension, I would probably set them up more around 54-60 degrees as your starting point, as opposed to cranking

them down to where their belly is sitting on top of their thighs and then loading them. That might be an issue for just about anyone.

But the weird thing with osteoporosis is that it does tend to happen with age, but if musculature is strong enough, it's almost not really of critical concern. And if you're loading the musculature in a way, that's gradual, then gradual upload and nice control movements and everything, the amount of force that's actually transmitted to the spine, even in loaded flexion is not that great and not that dangerous.

In the emergency room, we have people that come in and car wrecks and they have a broken neck, and it's very critical. We always assume a broken neck in a car wreck. And sometimes we need to take over their airway and put a breathing tube in.

So, there's all this emphasis on just not moving anything because the fracture fragments might injure the spine and all these precautions we take around it.

But there's actually been studies done that show it's not movement that poses the danger; it's *the suddenness of movement* that poses a danger of converting a spinal fracture into a spinal cord injury. As long as you're not, you can reposition your head. You can move around the fracture fragments. But as long as you do it slowly and gradually, you're very low risk for causing injury. I think the same thing is true with loading in people with osteoporosis.

People think of the skeleton as a scaffolding on which everything hangs, and it's not — it's actually a bio-tensegrity structure that the skeletal muscle acts on. So, it's more that the skeleton is suspended in the skeletal muscle rather than a scaffolding on which everything hangs and holds.

So, I think as long as you're observing good form with your clients, even with some degree of loaded spinal flexion, you probably have a margin of safety that's really, wide.

Now, that doesn't mean load them in flexion with their belly all the way to their lap, but it also means you probably don't need to be just so overly cautious that all you're going to do is timed static contractions and, “I'm afraid to load them” kind of scenario.

James Brown: Fab. Yeah. Thanks for that.

Lawrence Neal: Any follow up James? Are you good?

James Brown: So, I have a MedX low back and a pullover.

So, it's the timed static contraction in the pullover that I started doing, but I'm reassured by Doug's words. I'm happy to program in there and that obviously only very minorly flexed in that position. But I choose to set it for them.

Dr Doug McGuff: Yeah, this is a good time to pause just to say to everyone that what you guys are doing is really amazing because you are providing benefit and training people that no-one else will touch. It is scary to deal with these people that have medical issues and that are older, but it is such an invaluable service that no-one else is going to do.

And I understand that it is stressful. I really appreciate you guys, going into the deep woods with a machete and taking care of these people because no-one else will, no-one will touch them — even their own doctors won't!

So, the fact that you guys got the grit to do this is super impressive to me.

And I really appreciate the work that everyone does out there to be fearless. And to train the people that stand to benefit the most, even though they're not the most fun and glamorous to train.

James Brown: Yeah. Thanks. I couldn't agree more.

Like your video, and just to name some, just to describe the clients that I'm thinking about, they've been with me long enough, 30-40 percent stronger. And it's huge to them to be coming out of that frailty, to getting off a walker.

It's really huge impact. So, I love it. Yeah. It's life changing.

Lawrence Neal: Awesome. All right. Thank you, James. Okay. All right, Jack, over to you. Jack Dreznik.

Dr Doug McGuff: Hey, there's a name I know.

Jack Dreznik: Doug, Lawrence, good morning. Can you hear me?

So, my question for Doug is if he's familiar with Keith Barr's work out of the University of UC Davis here in California, and just a quick background: Dr. Barr is the guy who grows human ligaments out of donor ACLs in his lab, and then he injects them through various protocols, and he seems to have elaborated a protocol that will regenerate connective tissue, muscle ligaments specifically. And I've just come across his work, and it seems really far-reaching.

Yeah, just putting out putting that out there to Doug — is that a name you've come across?

Dr Doug McGuff: Yeah, I'm vaguely familiar with it and I think I've listened to a lecture that he gave or someone referencing him gave at the IHMC down in Florida, where I've given some lectures. So, I'm it's not something that I've reviewed real approximately in time, so it's not super familiar to me.

But I do believe that there are some of his training protocols that if you are looking for stiffness and power transfer, you train more explosively. If you're looking for resiliency and energy prevention, you train more slowly.

That, invoking the training protocol, in the context of supplementation with vitamin C and lysine and certain things are mechanisms of repairing and regenerating. Am I barking up the right tree here?

Jack Dreznik: Yeah, absolutely. And he works on all that. The really interesting thing that he says, though, is that to regenerate connective tissue – we'll just say tendons – you need to load them.

In the normal course of things, the healthy component of the tendon takes up all the load and it shields the pathological tissue – what he calls the scars – so that those scars effectively never get any load in the same way that if you were to immobilize a limb — it'll never get any load; it'll just stay in that state.

Now he claims that if you perform an isometric for 30 seconds or longer, there's a stress that he calls the *stress shielding*, where the healthy component of the tissue shields the unhealthy

component. That shielding 30 seconds, you are now getting load into the scarred or the damaged portion of the tissue.

And with a 4-x-30-second protocol that you could do twice a day, that's sufficient stimulus to regrow the pathological components of the tendon.

And he's got a case study with an NBA player, who essentially, had a like a hole in his patellar tendon, and five months later, it's completely resolved.

So anyway, that's the protocol I'm playing with now.

Dr Doug McGuff: Yeah, so, a few thoughts on that. One is as we age – and particularly, as athletes accumulate damage from their career – we develop, not an inflammation, not a tendonitis, but a tendinopathy.

So, the elastin molecule that is the backbone of tendons is composed of amino acids and proteins that result in a very springy beta pleat, 3-dimensional structure, which gives it its elasticity and that particular shape, is very much dependent upon the insertion of a proline amino acid at a certain juncture in the chemical sequence.

But as we age, for reasons not fully understood, we begin to lose the proline insertion at those sites and insert different amino acids in their place, which causes that beta pleat structure to go away. So, you lose elasticity.

The idea behind the long tendon loading is that you actually create a damage that creates an open spot at that proline site that you can then, through the stimulus of the exercise to expose that site and the supplementation with vitamin C and proline and College and peptides, things of that nature can reinsert the proline at the appropriate site to restore that elastic structure.

That's the idea behind it.

And when I hear you describe this protocol to me, I think one thing that is contributing to the shielding of that pathological tendon is not just the other areas of the tendon. You've got to remember that the entire process is a musculotendinous unit. And I think that what is shielding the pathological tendon is probably 80 percent in the muscle belly, and maybe 10-20 percent in the tendon portion of the musculotendinous unit itself.

And I think that prolonged deep stretch negative is not just the prolonged loading, but the fact that you are accumulating fatigue in the muscle belly so that the tendon can no longer be shielded.

And I think that if… I would be very interested to see his protocol be measured against slow cadence resistance training that results in significant fatiguing of the muscle belly, because I think that is the key to unshielding that diseased portion of the tendinopathy.

And sometimes the tendinopathy and athletes with an acute with a specific injury, it's at a specific location, but in older adults, the tendinopathy is spread throughout the tendon. It's like a certain percentage of the tendon has deranged elastin, and the whole tendon is protected by the muscle.

So, it's not just the loading of the tendon, but the fatiguing of the muscle so it can't allow the tendon to hide. And I think that can be achieved by protocols that are more similar to what we do, and I think that we do offer that benefit.

He's also shown that plyometric or explosive training builds a stiffness into the tendon that allows more transfer of force to the ground or whatever is the force is being applied to, but at the risk of increased injury.

And slower movements actually build resiliency into the tendon. And what you exchange for that is a little bit of explosiveness off the ground or off the implied off the applied object.

But I've heard it said by many professional athletes that in the first two years of their career in the weight room, they're trying to improve performance, but for every year thereafter and every veteran in the weight room, what they're trying to do is prevent injury.

And I really think that high-level athletes' performance is taken care of by their genetics and their practicing, and really, what resistance exercise needs to do is protect them from injury, not necessarily to improve their performance,

Jack Dreznik: Doug, I appreciate that. And yeah, he does elaborate how isometrics and just being the slowest version of loading is going to be useful for connective tissue, but that any slow challenging loading, such as that we do is going to be useful as well. I appreciate that answer. I got to run and get on the floor, but I'll be listening. Thanks guys.

Dr Doug McGuff: Great question. Fascinating topic.

Lawrence Neal: Yeah. Thank you, Jack. All right. So, just a question here on the Q&A pad – you'll like this one, Doug – Steve asks: what do you think is most important thing to add to a program after the Big Five?

Dr Doug McGuff: A second round of leg press!

No, I think the most important thing to add to the program is to free your mind from Body by Science and the Big 5.

That really was chosen just because, for simplicity's sake, because we're using big compound movements to cover multiple muscle groups, and we're letting motor unit recruitment and the Henneman Size Principle to take care of the issue of hitting all the different muscle groups.

But it doesn't have to be that way. Bring your mind, make up different programs for your clients. If you have other equipment that can more directly address body parts, making yourself a mix and match of big compound remove movements and isolation movements so that you are playing the long game with your clients.

In the beginning, you can use a Big Five type of approach, or just a handful of compound movements and really hammer it and enjoy being on the steep slope of that improvement curve. But that is going to plateau, and I think just wipe the Big Five out of your brain, use all the tools that you have at your disposal to play the long game with your client.

You've got to think of this as your client, you are going to be a Sherpa that takes them on a never-ending mountain climb that goes on for the rest of their life. And I think that's the way you need to approach it with your clients going forward. Big, multiple, a handful of compound movements. It is a great way to start.

But you may need to be a little freer in your thinking and a little bit more creative as you go.

Lawrence Neal: All right. Thank you, Doug. And Skyler, I'll let you talk in a second. Just one more question here from one that was submitted. What are your thoughts on TRT use, Doug? Obviously, that's becoming more popular.

What are your thoughts on long term use? Is it safe? This person, this is a friend who uses it. It almost seems addictive for certain individuals. What's your thoughts there?

Dr Doug McGuff: First, it's going to be addictive because you've got to, number one, look at how much it's going to cost. Number two, acknowledge that once you start, you are going to contribute to the feedback loop that's going to shut down your own production.

It's going to shut down the latent cells in your testes. You're not going to make your own testosterone from it anymore, and you're therefore going to be dependent upon it. So, addiction is built-in, baked into the cake. It's part of it. Do I think it's unsafe or dangerous? No, but I would make certain that you're not just going to a TRT clinic run by a doctor that's just wanted to get out of clinical medicine because it's such a beat down, because then you're just going to someone that's going to write you a testosterone prescription the same way.

If you walked into the gym and got some bro to hand it to you under the table, what makes certain that you really do have some criteria for needing to be supplemented and to not ignore the degree to which proper training, proper diet, proper stress control and proper sleep can massively improve your testosterone profile.

I've seen people go from the 400 into the low thousands just by improving those lifestyle elements.

Secondly is, if you're doing testosterone replacement in a physiologic range, completely safe. And it may be life-changing for someone that truly is deficient, but you got to ask… it depends on what you're doing.

Some people are doing TRT, which is really just a backdoor to taking steroids. You're getting it prescribed. The DEA Is not going to bust you if you're taking super physiologic doses.

You're taking steroids and then you're getting into a dose range where the therapeutic effect of it is pronounced that the side effects have to come along for the ride. You're going to have to monitor your hemoglobin to make certain that your blood's not getting too thick. You're going to have to watch your blood pressure closely.

It may start to have emotional and cognitive effects that transition from the beneficial into the less beneficial. You may be more morose, angry, so it just depends upon the context.

I think it's a perfectly legitimate thing to do under the correct circumstances, but it's also a huge backdoor to, “I just want to take steroids”.

Lawrence Neal: Thank you. Just… sorry, one more, Skyler, and then we'll move on.

Is there a benefit in performing a second push or pull exercise and a workout?

Just to give this question some context: I've seen this individual does a Big Five system. So, they're thinking, “Oh, should I do an additional pull or push exercise? What's the point with the client?”

Dr Doug McGuff: Depends on the client. And the other thing is although Henneman’s Size Principle takes care of a lot of things, the plane in which you're pushing or pulling determines the order of recruitment of certain muscle groups.

If you're doing a vertical push, more motor units in the primary load-bearing musculature are going to be recruited earlier and then things in your pectoralis and other muscle groups are going to be recruited later, whereas in a horizontal pushing movement, motor units are going to be recruited sooner in the predominant musculature in the chest and even the deltoids kick in later.

So, there is some benefit in that, yes, you can rely on Henneman’s Size Principle for a lot, but what is in the primary line of fire, so to speak, does change the movement somewhat.

Yes, there is some benefit, and it's up to the trainer looking at that client, what their goals are, and what their recovery abilities are to decide how to parse that in.

But is it a bad thing to do them in the same workout? No, I do it all the time.

So, it's context dependent. It is not that important of an issue. As long as you're doing what you're doing, delivering a meaningful stimulus within constraints of recovery of the schedule you set up for them. it all works out.

Lawrence Neal: Yeah. Murray, I think it's your question, isn't it? So, if you've got a follow up, let me know. I will follow up on your behalf though, if it's okay.

Just to maybe clarify, Doug, I think what he means is if there's, like, a chest press in the workout, add a push-up in the same workout or another horizontal push.

So, two horizontal pushes or two vertical pulls in the same workout — is that redundant?

My thinking is if the client isn't producing a lot of effort on the single set on the first push or pull, then having a second might help in terms of eliciting more fatigue.

But what's your thoughts on that?

Dr Doug McGuff: Yeah, it's very, it's context dependent, first of all.

Second is it doesn't matter that much; we don't have to get religious about this shit.

Okay, if it's a different movement, if it's a different vertical pull, there may be something to that. It may have a completely different sticking point than the primary movement, which allows a recruitment pattern to allow them to accumulate a deeper level of inroad.

People are working out in gyms all over the country doing multiple sets of the same movement. And working their way up to a level of fatigue more gradually than the way we approach it. There's lots of ways to skin the cat.

You don't have to be religious about it — it's fine.

I do in my work when I do chest, I'm doing, a MedX chest press. And then I'll do an abdominal flexion, and then I'll move into the SuperSlow Systems ventral torso, which is another chest press-type movement, but it's in a different plane. But I can come back and do a 2nd set of the MedX chest press. It's fine. It's okay.

Lawrence Neal: Good stuff. All right, Skyler, here we go. I'm going to hit *allow to talk*. It's over to you. Are you still in the sauna? Have you finished?

Skyler Tanner: No. No, I'm back at the facility. Polar opposite here.

Hey, Doug, I don't want to come in sounding like Darden saving Jones' ass at Duke all those years ago. But I want to actually add some color to James's question and Jack's questions around osteoporosis and loading because I'm writing a book. So, this is all fresh of mind.

So, one of the things I do want to point out being so scared as your phrase of these people are not made of porcelain, but the system treats them that way is that since we have no data, we have to take it on Ken's word about the super slow osteoporosis study that if we look at other studies, that resistance training actually meaningfully improved bone mineral density in osteoporotic women, they are using weights no lighter than an eight rep max.

If they could do nine repetitions, the weight was made heavier. And that's a substantial load, right?

So, these women are typically women are using heavy-ish loads, and they're doing it for years at a time to see this improvement.

Maria Fioroni spearheaded one of these studies back in the 90s, and it's just been replicated again and again.

So, James, these women are not made of porcelain, or this person is not made of porcelain and you said osteopenia, then they're really not made of porcelain. So, your job is to get the strength back because strength was lost, before muscle, before bone. That is the order of loss, assuming no pathology to get to bone mineral density decreases, number one.

Number two, with the tendon stuff, here's a little nice thing: Keith Barr was a grad student of Mike Gittleson at Michigan. So, he actually has this HIT lineage that traces back to us.

And it was not a basketball player, it was a javelin thrower in New Zealand who had an MRI-confirmed hole in his patella tendon. And it was daily 30-second isometrics on a leg extension in the full flexion position, ramping up to the highest tolerable perception of effort without pain.

And then some number of weeks later, as you said, you get to another MRI and there's no more hole in the tendon.

But very interestingly, to your point, there's another protocol. The *Isos* tend to be really useful in that it validates everything Nautilus said through a backdoor kind of path, something called

heavy slow contractions or heavy slow resistance for managing tendinous injuries. And these individuals are using a fixed rep max at a 3-3 cadence.

And what it gets demonstrated again and again is drastic improvements in the symptoms and return to play in tendinitis, patella tendinitis, Achilles tendinitis, high hamstring injuries. And gosh, that sounds a lot like something that many of us have done for a really, long time, doesn't it?

But it comes out of the rehab literature, so you won't find it in strength and conditioning; you find it in the PT journals.

And so, this idea that inadvertently what we're doing with controlled cadence resistance training, if it's sufficiently loaded, if it's not, you ain't going to get there on three minutes sets of super slow kids. Like it's, gotta be, it's gotta be heavier.

When I take all this in, I want a client within the boundary conditions of their ability, because that's a whole separate discussion to be as controlled and, relatively speaking, loaded as possible, given all of this, and it's gonna improve the bone, it's gonna improve everything from bone to tissue to nervous system, you're doing the right thing, but just to tie those two questions together, it's all linked up and it works really well.

That range is really important.

Dr Doug McGuff: Yeah, the one question I have in all that, Skyler, is I don't know that we have proved that it has to be that heavily loaded. I don't know that there's any studies or data that have looked at lighter loading that have looked at actually going to complete muscular fatigue.

Let's say it took 2-and-a-half to 3 minutes, that if you still got there, I think one of the key issues is that there is some degree of load and that can be moderate, and that load has to find its way to the tendinous portion of the musculotendinous unit by virtue of fatiguing the muscle belly. That's what uncovers and exposes the tendon to the load, which results in this basically elastin popping and exposure of the proline sites and things like that.

And I think it's just an assumption that it has to be that heavy. I don't think it's been proven yet. I would like to see them try it more. It doesn't have to be ridiculously light loads, but at least moderate loads to see if we might have a better margin of safety because, in my job, at work, I'm subspecializing in Advanced Emergency Medicine Ultrasound.

When we ultrasound, right…? People with suspected Achilles tendon ruptures, a lot of times, it's just ruptured; but a lot of times, it's like a fraying rope that I think that, if you were able to apply this protocol with a more moderate weight and a larger, a wider margin of safety, that might be rescued.

Skyler Tanner: To your point, a lot of these… you remember John Christie from the, sort of like, Cyberpump kind of stuff?

When you look at the way in which the heavy, slow resistance is actually progressed, they don't start at 6 RM, they're starting at 15 RM and working down to that 6 RM… based on symptoms.

So, in some ways it's almost, my point is, very interestingly, that in a totally different silo inadvertently, something that very much resembles HIT is being used to improve the quality that they care about. And yet in this space, once we come into this silo, a lot of people will say that's only going to work for muscle.

It won't work for the…

Dr Doug McGuff: …discovery in different silos because…

Skyler Tanner: Exactly!

Dr Doug McGuff: …what works?

Skyler Tanner: Yeah, yeah.

And so, that is the progression they start with. Typically like a 15-rep, and find the 15-rep max, work it down to a 12, almost like linear periodization from power lifting, but it's maintaining the controlled cadence throughout.

And once they get into a stable 6-rep max, which is probably not a true… it's not like a power lifter 6-rep max, because they're controlling the loading, the control, the rate of loading on the tendon. That's one of the things they really care about — not trying to elicit the elastic nature as much as possible.

And then that's where they see the big benefits, but they're starting... So, to your point, it may be just table-setting to get to those heavier loads, but it's making an improvement.

Lawrence Neal: Yeah, awesome. Skyler. Thank you so much for that. And thanks for the great answers, Doug. I want to be respectful of your time.

We're right at the end here, and thanks again. This was great. enjoyed it. We can do it again soon. And to learn all about obviously your services, Doug, people can go to **drmcguff.com**. So and all about your consulting. Is there anything else you want to mention related to that?

Dr Doug McGuff: Nah, that kind of connects to everything else you can find off there.

Lawrence Neal: And if you're not familiar with That option guys, I'd highly recommend you go check it out.

So, it's **drmcguff.com**, and you get some great consultancy services from Doug.

Again, this is obviously going to be published inside the Membership for future reference, so please watch or listen back, and have a great rest of your day guys.

And obviously we'll do this again in August. We do it every month. Doug. So good to see you. Really appreciate it. And we'll talk soon. Awesome, all right. Take care. Bye!

Dr Doug McGuff: Thank you!