

The Tim Ferriss Show Transcripts

Episode 85: Kelly Starrett

Show notes and links at tim.blog/podcast

Tim Ferriss: Hello, my wonderful lads and lasses, this is Tim Ferriss. Welcome to another episode of "The Tim Ferriss Show" where my job is to deconstruct excellence – to tease out the practices, the habits, etc. of world-class performers that you can borrow whether those people are investors, athletes, celebs like Arnold Schwarzenegger, anything in between, and everything in between. And this episode is by popular demand. We have Kelly Starrett making a reappearance. And, for those of you who don't know who he is, Kelly Starrett is cofounder of San Francisco CrossFit and he's been there ten years – 133,000 hours of training CrossFit athletes.

He was one of the first 50 affiliates in the world. Now there are more than 10,000. His clients include Olympic gold medalists, Tour de France cyclists, world record holders in Olympic lifting and powerlifting, professional ballet dancers, elite military – it goes on and on. And, when I break myself, Kelly is the guy that helps me fix myself and that produces some pretty hilarious encounters because he's very fond of tearing my hips apart, among other things. But, in this episode, you submitted questions – a lot of questions – and then voted them up or down. So there were 3,317 votes on different questions at last count. And he answers some really, really specific questions that are very tactical.

So, for instance, top three to five mobilizations that everyone should be doing, 15-minute mobility WOD that every company in America should enforce three times a week, applying 80/20 analysis to post-workout recovery, and much more than that. He busts my balls a bit which is always good fun. That's something that Kelly's also world-class at.

Takes the piss in the beginning – for you Brits and Commonwealth folks out there. In any case, I hope you enjoy it and I would be making a grave mistake if I didn't mention one other thing and that is my birthday's coming up shortly. It is my 38th and, every year, instead of getting gifts, I try to rally all of you to do something very cool and ground-breaking. And, in this case, I'm partnering with Kelly and his wife, Juliet, to create the first standing desk-only elementary school in the world. And this is intended to be a prototype – a proof of concept – that could do a lot of good around

the world and, basically, serve as a model for redesigning schools around the country since kids 8 to 18 spend 85 percent of their time sitting down. And the effects of extended sitting have been compared to smoking, for instance, by people at the Mayo Clinic and we think that is a big problem.

So if you go to fourhourworkweek.com/standing – S-T-A-N-D-I-N-G, all spelled out. So fourhourworkweek.com/standing you will see exactly what we're up to. It's very, very cool. I've put in \$10,000 of my own money to put my money where my mouth is. Kelly and Juliette have done the same and, if a lot of you are rallying, it could really be a ground-breaking high leverage Archimedes lever to do a lot in the educational system but we need this prototype and it's about halfway there. So please help us finish it off. Fourhourworkweek.com/standing. And now, please enjoy the Q&A with the very funny, and very talented, and very handsome Kelly Starrett.

Kelly Starrett:

Hey there, this is Kelly Starrett from Mobility WOD. I have to tell you, any time Tim Ferriss calls me up or has a hairy idea – some kind of crackup idea about, "Hey, why don't you come on or let's talk, or let's have some dinner," my red flags go up.

I'm not going to lie. My antenna goes up because Tim is a little smarter than me. He's a little faster than me. He's more wily than I am and he always ends up getting me to expose myself. And what was great about when he said, "Hey Kelly, will you come on and answer some questions?" And I was like, "Absolutely, my pleasure but you're not going to be there, right?" So I get a chance to speak my peace without having to be worried about, "What is Tim thinking of me?" and, "Tim's so pretty and he's such a good dancer. I'm so jealous." What we get to do is take the questions that you guys value as important and just riff on them. So I'm going to do my best. I have a cup of coffee over here. I'm spun up. I've done my breathing exercises. I'm ready to bring it. So, without further ado, here is the first question.

Ten questions with Kelly Starrett. This is from Chris Livingston in Ontario, Canada. And Chris says, "Kelly, how long did it take you to fix yourself once you started seriously self-mobilizing? Can you share any stories from your personal experience of becoming normal again?"

And I have to tell you, hell yes. I may be a guy who's out there, but I'm a user. I fight for the users. So much of my experience has

come out, originally, of solving the problems of the athletes – of my friends – right around me and my own experiences. People forget that I was a broken, broken athlete whose hand went numb, went down the sports medicine rabbit hole, had cortisone, prednisone, all the zones. I had MRIs. I've tried acupuncture, a massage therapist, or decompression and I really couldn't get to the bottom of what happened. What happened was I was moving like crap and I wasn't taking care of myself at all, and I lit myself up to a place where my body was giving me warnings for a long time. My hand would get weak, sometimes, and my form would pump out – I couldn't hold the paddle. And that was my nervous system telling me, "Hey, you've got a problem," but I just overrode it.

So rehabbing that nervous tissue injury or realizing that, boy, it's not about working harder – there has to be some other piece – that really put me on the pathway of thinking critically about my body in a very different way. My girlfriend, at the time in college, was a [inaudible] and we were together the entire time she was in school and I had been exposed to all the soft tissue work. And what was great was laying down on the table and having someone fix me. And we used to fight about it and she'd be like, "You have to stretch or take care of yourself," and I was like, "I'm pre-stretched and you're not the boss of me and why don't you just fix me?" What a terrible, terrible parent I would be and, of course, the relationship ended terribly because it was my fault because I didn't mobilize. My C2 partner, he would cramp up in the boat – his feet couldn't handle it – so he had to do these elaborate routine which took him all of seven minutes to get his feet and hips ready to be in the boat. And what's interesting is that he got feedback that his mechanics were off – as in he couldn't sit in the boat and it hurt him – and I didn't.

And I waited until I literally broke before I was like, "Oh, that's why Shane is doing the things he's doing." So my red flags were... Well, obviously I had that problem. I also had this problem where my quads were always tight and I had knee pain all the time. I got that knee pain when I ran and, of course, my biomechanist, he showed me I was running like a moron, heelstriking. So I fixed that. One of the things that was happening is that, in the early days when I was initiating this strength conditioning experience in 2001 and 2002, I was Olympic lifting with Jim Schmitz, and I was following what Pavel said, and I found CrossFit early on. What was happening was I was doing what guys like Mark Rippetoe were advocating – even Greg Glassman and Nicole Carrol – which was to crank my pelvis over as hard as I could which made my low back stable – it was functionally stable – but I was bone on bone in

those positions. And what would happen as I was trying to squat heavy, these 5 x 5s, and my back would ache for ten days afterwards. I literally couldn't squat heavy again for at least a week.

And my back would be thrashed and my quads were really tight. And I was always trying to work on my quads. I was doing these crappy low-grade static stretches and it didn't seem to really work. Now, of course, my quads were stiff and I really hadn't addressed the stiffness so I would do some cheap foam rolling and that wouldn't really work. And it wasn't until I realized that I think I was over extending and I couldn't do what these coaches were saying. And the coaches were trying to get us into a non-flexed position but they were not talking about a braced neutral position – which is a very different idea of sequencing and organizing the spine so that the abs and the nervous system do what they do. So I was in this extended position and my quads would get tight. And so that's one of the first times that I realized that I had to prioritize the motor control and the bracing sequencing in my nervous system organization if I was going to get ahead of some of the downstream muscular problems – the neuro muscular, the contractile feature problems.

So once I started organizing my spine differently and doing what I was supposed to be doing in gymnastics and the things that we were talking about and all the positions – not just cranking overhead as tight as I can, extending it to the belt – my musculature in my quads released and I stopped having knee pain almost immediately. I look like a professional kayaker – I used to boat 300 days a year, I surfed, sometimes I boated twice a day – and I basically had no inter-rotation in my shoulders, none. And I remember being an aide in physical therapy in 2000 and someone pointing out that I had no internal rotation and me being like, "Pssh. My shoulders don't hurt. I'm strong enough and I'm a kayaker, so what's the big deal?" And no one could really articulate why that was important – just that, "Hey, you should have this." And we never even went back to it. No one fixed it. It wasn't something we dealt with in the clinic I was in. And it wasn't until I started teaching a lot and seeing the ramifications of missing shoulder rotation that I really started to address my own.

And what's happening was that, when I would go from a hang position into an overhead position, my shoulder would translate forward. You could see it in my dips, you could see it in a lot of things. And my shoulder would crook out a little bit. And was this, again, early CrossFit and when I started really drilling down on it

and then correlating what's a normal range of motion was, it really cleaned up really quickly on the inter-rotation front. So that was a big deal.

If you take a look at the photos of me in "Becoming a Supple Leopard" – the old "Supple Leopard" edition – I'm pretty turtle-y. I have what looks like a hinge in my mid thoracic where I was hanging on the meat, basically and that was a function of sitting, and kayaking, and paddling all the time. And you could see it in my deadlift – literally, my head would be lower than my lumbar because of this hinge there. So I've spent a lot of time fixing that and that has really changed my ability to manage a brace neutral position without being stuck.

What I noticed in the practice, to get to your bottom line, is that I had to start noodling on this stuff within the context of still training and within the context of having a family, and working a job, and being busy physio-teaching. And I made a commitment to 15 minutes a day. I was like, "Okay. I can solve these things if I just work on a problem 15 minutes a day." And I started working around other people. The work I did in physio school to graduate, I really looked at investigating research barriers to adherence. And what I found was that there was a 15 minute, 20-minute magic window where I know I can get some people to do some work for 10, 15 minutes and I'd get really good at adherence. And if I extended that at all to 20, 30 minutes, it would drop off – it would lag. And so, with my own clinical practice, around the gym, trying to work the mobilization into it, we found that literally 10 or 15 minutes was a magical number to make some significant change in yourself if you were primed to do it and you did it regularly.

I started obsessing about some problem and I would just obsess about it for a couple weeks and then the problem would go away. I think I am lucky because my tissues are pretty healthy, I have pretty good indigenous range of motion, anyway – I'm not the stiffest guy - but I can tell you I had real stiffness in my quads, my shoulders were manky, my mid-back was totally a junk show. And I really noticed that, when I got consistent, I got ahead. And when I get behind on something, I start to see that it gets stiff. And I'm usually not a guy who experiences pain but I can tell you that, the more I optimize my mechanics, the less stiff I got. So if I went out and heelstrided, for example, it seemed to make my quads and calves very tight but, when I worked on learning good running mechanics, I had no problem. When I deadlifted in an overextended position, it tended that my lower back would get

really stiff, and my glutes and my piriformis would light up all the time, and I would always smash out.

When I stopped overextending on my deadlift, my piriformis stopped lighting up and that really was a key aspect of this, was, for me, figuring out that I had to put position mechanics first and then I had to do less maintenance. And I think that is a fair equation where, if you put more time into moving well, then your body has to compensate less and you get less stiffness patterns out of that. I'd just paddled the Molokai Challenge – Jim Foti's race from Molokai to Oahu, it's a 53 kilometer open ocean race – and I didn't have any mechanical problems. My left hip got a little stiff because I was sitting and paddling for my life in a very technical race and a very long race but nothing hurt. And nothing hurt because I move pretty well and I'm pretty grateful I've been cultivating that. As an indicator, unfortunately, the worst move, the stiffer you get and then that stiffness begets more poor movement patterns which makes you stiffer.

So really keeping in mind that I had a physical therapy instructor who taught pediatrics and she was talking about dealing with obesity in kids and tone. And she was like, "Hey, look, muscles and tissues are like obedient dogs. It comes down, in some kids, that we have to cast them to in-range and then, a week later, move them around, exercise them, put the cast back on. But, in two weeks, you can get a massive amount of tissue change in a kid who was so functionally short." They would just cast them into these in-ranges. And I know that sounds barbaric but the idea underneath that is it's about will. And I think, sometimes, some of us need to spend more time on a certain problem but it always comes around. And I think a good example in our gym is Roop Sihota – Dr. Roop, he does these mobility clinics in our gym with our staff and our great physio – but that guy was the stiffest, stiffest guy on the planet and the amount of change he's made, consistently, over a few years has been profound.

The guy can basically do the splits now – he can do the splits now – and I'm telling you, when I met him, he couldn't even squat down with his heels on the ground. So we know it takes time but, if it's 7 months to turn over all your fascia and 18 months to turn over your whole skeleton, then chances are you need to really drill down on that. And that means eliminating a lot of things that are causing you problems like high heel shoes or sitting. So that's the short end of the story which isn't short at all.

Next question comes from Connor McClure from North Carolina. "Generally speaking, what are the top three to five mobilizations that everyone should do, every single day?" Well, the problem, frankly, with that is that, if you end up creating a program, then you're going to create a lot of blind spots. And what we've done instead of saying, "These are the basic five," is we've said, "Here are the seven positions around your shoulders and hips that you should have cold." And that means that you should be able to do it cold out of bed.

You shouldn't have to warm up. You shouldn't have to work hard to reclaim your position. You should be able to go into the gym, grab a barbell, and start moving and getting physiologically hot. You shouldn't have to work on establishing overhead position in your jerk because you should have overhead position in your jerk when you go to jerk. And I think the problem is we've confused the training with, "Hey, I have normal range of motion." And baseline motions like I can actually put my arms over my head. I see so many people who literally are missing overhead range of motion and then wonder why their shoulders hurt when they do pullups. Well, it's because you're missing overhead range of motion and that pullup is forcing you to have a whole bunch of car accidents in your shoulders. So the problem with three to five mobilizations is that you end up prioritizing some areas and some tissues and completely deprioritizing other areas of your body. So the issue, as an athlete in a complete movement practice, you have to be able to do everything physiologically that a human can do.

That means you have to be able to pistol, even if you don't do pistols, you have to get into the pistol shape and that means you're probably going to have to talk to your feet, and your calves, and your hip, even if you're just a swimmer. Right? You're pushing off the wall, or running, or whatever. The point is I can say, unequivocally, that probably everyone can benefit from something that looks like the cow stretch. It's low level, it's a static stretch, but at least it gets you into this extension pattern out of the other pattern of sitting – of this rounded flexion position – and you could probably do that every day and spend as much time in a lunge every day as you could. You could probably hammer your t-spine a little every day, those of you who are on a computer or a phone which is, i.e., all of us. You could probably stand to do some gut smashing every day, particularly before you go to bed. You could roll on that ball. Around the shoulder, I would really hammer overhead positioning – it's just so crucial – and then missing shoulder inter-rotation. I think you can get away with missing some of the press. It doesn't have to be perfect.

I don't think that the front rack necessarily has to be perfect. They all have to be normal. And I think you bring up this point that, if there was just three to five things, that might be a problem list thing that I kept for a week. If I'm just going to do three to five things for three to five days in a row – ala Pavel three to five for three to five – but the idea here is I've got to make a problem list in my brain around a position and then I've got to go actively looking. And that's a conversation that you need to have with yourself around being generally physically prepared. And so I don't want to waffle but that three to five mobilizations a day won't cut it and has never cut it. So dynamic warmup is dynamic warmup – that can be the same. But your job is to freestyle around the other stuff. So, sorry, Connor, but you're going to have to be smarter than that.

This is from Marcus Wong in White Rock, Canada. "If you were in a program of 12 minute MWOD that every company in America enforced three times a week for their employees, what would that program be?"

Well, once again, we're back to a problem where we're saying, "Well, if sitting or standing is the issue, then we could program around that problem." So what am I saying? Well, I work with a lot of pilots in the Air Force, a lot of pilots in the Marines, and a lot of pilots in the Army – and even the Coast Guard, okay, I work with them all – and we see that all the pilots share similar mechanics. They're in a really bad position with a really heavy helmet and then the cockpit isn't set up for them. So what we do is we try to get them to prioritize their spine and sacrifice the shoulder whenever they can because once you've herniated discs in your neck, it's really hard to unring that bell but you can reclaim your crappy shoulder position once it's on the cycle. Right? So sitting at a desk is really a big deal and, if we were going to prioritize anything around that, I would say getting into the activities of daily living shapes...

So what happens is, when people sit a long time, you kick out two of the three stabilization practices – the systems that stabilize your spine. You can no longer create torsion through the hip, through the foot – because you're sitting – you can't squeeze your butt or use your glutes to control your pelvis/lumbar relationship and so you're left with just your abs. And so we say what the four horsemen get tight – the QL gets tight, the psoas gets tight, and the iliacus gets tight, and the rectus femorus gets tight. So, basically, your quads and your low quads, and then in your back – which is the hamstrings in the back, your quadratus lumborum. What ends

up happening is we see a pattern develop around the sitting and that should be no surprise. So we could program some soft tissue that would ameliorate some of the very symptoms of those static positions. And that really brings up an interesting question that, "Boy, if I'm a swim coach..."

And we've experienced this with Sage Hopkins, who's the head swim coach at San Jose State, is he knows what swimmers look like and there are a common group of symptoms around the swimmer that he can program to directly. And, if you're a runner, you'll see that there are very specific running related problems. Do you have to have good thoracic spine? Yes. Do you have to be organized? Yes. Does it matter what your shoulders do when you run? Absolutely. But I can say, unequivocally, that there are very specific running related issues that you could prioritize. So if we took that concept away from saying, "Hey, what's a 12-minute thing?" If we said, "Well, we see that people have a hard shutting down so we teach them to shut down – teach them to breathe, do some breathing exercises. Because all of a sudden, that would improve the mechanical efficiency of the breathing that we would see, decrease stress breathing patterns.

People would literally feel better when we got them out of a stress breathing/inefficient breathing pattern. They'd be able to stabilize. Instead of stabilize or breath, they'd stabilize and breathe. Then I would probably address, honestly, t-spine, the four horsemen, and maybe some crappy internal shoulder rotation. And, all of a sudden, you've created a little recipe... And the thing that I think has really helped that we see around program design is it helps to keep people interested with new things so they find a new mobilization – they're like, "Holy crap, I suck at this." One of the reasons people like bikram yoga, I think, is that they get to do the same series of poses over and over again, and then they know the steps, and they're not really uncomfortable. And what I think is a really valuable lesson is to go expose yourself to the same thing in a slightly different way.

And, if that sounds a lot like conjugate programming ala Louie Simmons, well, we like to do the same thing in programming mobilizations. If we make packages, even – or we do this for the universities that we work with – we'll put a packages together and then that package may be a neck package or a shoulder internal rotation package. And that's literally how we program a little bit. It usually takes about 10 or 15 minutes. And then we cycle through those so people use to learn the dance steps but the dances, themselves, are constantly changing. So that's the way to think

about this. It keeps it novel and it keeps my mind looking at different things. And, also, I've got to address this systems approach to tissues. I've got to adjust for the joint capsule. I've got to make sure I'm going after the sliding surfaces – how our tissues are sliding over one another – and I've got to address for the contractal features of the muscle – the trigger points in there that are gobbling that up. Hopefully, someone has a movement practice but, if I hit those three things right away, I could knock out a lot of the problem. Even if they kept moving like crap at home, at least we could start to program to those issues. So that is what I would say.

The real issue is we're going to adopt the positions we spend all our time in so let's constantly vary those positions a little bit. Let's create a movement-rich environment.

"How would you apply the 80/20 analysis to post workout recovery?" This is from Shay. "In other words, what selected 20 percent of recovery methods account for 80 percent of the majority of post-workout recovery?" Well, I'm not a sports scientist but I hang out with a lot of sports scientists and what I can tell you is that the best practices around post-workout recovery are simple. And these are the things that we lecture about to all our soldiers and all our professional teams. 1) Drink something right when you're done. If you're slightly dehydrated, you can't kick on any of the protein synthesis stuff that needs to happen. And so what we see is that people are blown out and then you get into your next window.

So you start getting onto the next thing. If you drank some water or absorbed some water, then you would set a stage for being able to recover a little bit. So slugging some water right afterwards with some sea salt makes a huge difference. And putting those electrolytes back in – massive, massive difference. If you can eat something within 20 to 40 minutes... I hate to say it – that's so old-school but it really does work pretty well in terms of not only recovering – because I think it probably only matters what you have in your system before you train more than what happens after you train – but you're looking ahead at the next thing. So I think it matters if you can eat a little bit afterwards. And if you're already well-fueled, then probably just eating some food afterwards is great instead of some manufactured thing. I think one of the biggest problems that we see is that people train really hard and they become immediately static and what ends up happening is that, if you think about your own practice, you train, train, train, train, and then you go to work. Or you train, train, train, train, and

then you come home and sit on the couch and go to dinner or have dinner.

And what I can tell you is that you're really good at bringing the engine up – getting it idling and then getting it revving – you're pretty good at that but you're not good at cooling down or bringing the heartrate down or giving yourself a chance to shift out of exercise mode. And what ends up happening we see adaptation in the tissues – tissues become poorly perfused. You get stiff, you get congested. If you can keep moving a little bit, that would be a difference. And we see that change even if you have a standing station – you can constantly be shifting and moving and putting your foot up and putting your foot down. And if you go sit down or jump on an airplane, you're going to really see the effect of cankles. Throwing some compression socks on is a game changing experience. I really have found, with all the athletes we work with... LeBron James jumps in a cold bath which is about resetting his nervous system – not about cooling him down – but he wears compression before he gets on the airplane.

And with our high-level athletes, we throw Mark Pro on them. We start getting them to clear that ugliness and then, in multiple events, we'll have athletes go for a walk in the evening, or ride a bike, or just get themselves moving – non-exercise activities. I think the biggest error is we don't get a lot of non-exercise activity. And what's happening is that most of us are exercising and then we're sedentary. We've got to break that cycle. I don't think people are sleeping enough. And someone tweeted the other day, they were like, "Look, if we just got enough Vitamin D – enough sunlight – and some sleep, a lot of the problems underlying our physiology would clean up because the system is pretty robust." So get some sunshine. Get your eight hours of sleep – whatever it takes. Fight for your sleep, especially if you're training hard. I think those are the big errors.

So you can go back through that list but I think being hydrated, well-hydrated, with the right dose. You don't have to drink gallons of water. I think that's ridiculous but I think you need to absorb the water you are drinking – thinking critically by putting a pinch of sea salt in there – really cleaning up your sleep, cleaning up what happens to you after your exercise – can you walk around, can you be in a constantly moving, can you wear some compression – get some Vitamin D. I think those are the biggies. Well, thanks Shay. I think that's a fantastic question. I think that we like to save all the soft tissue work – as an addendum – we save all soft tissue work for afterward because that's the perfect time to tell your body to

chill out and soft tissue work really kicks on your parasympathetic nervous system – gets you out of that sympathetic "fight or flight" hot and heavy and back down to, "It's cool. The animal is under no stress." You need to stress and destress. So we like that soft tissue work for afterward – even before you go to bed.

This is from Mike D. in Seattle. "What is the key to permanently improving mobility?"

I do my mobility work daily but, every day, it feels like I'm just as tight as Day 1. So underlying that is you can fix the problem but, if there's a hole in the tire, it doesn't matter how much air you put back in the tire – you're going to see an issue. So if you're running like a duck and moving poorly, again, that's going to reinforce movement patterns underneath that are going to trigger stiffness or inefficiency. So if you look at your calf – and the pination, the muscle striations in your calf – it's designed to work really in line. And if your foot is collapsed and calf is pulling obliquely, you're introducing a lot of strain and stiffness in the system that your body is going to appropriately deal with and accommodate for just by creating stiffness in the calf. And so you're going to see people who run really efficiently, their calves get stiff but not to the degree that the people who are moving less efficiently do. So you've got to go back to the movement mechanics. And that's why the name of our course is "Movement and Mobility" because that's what we found is that when we give people the solutions to their crappy problems, we didn't ever fix up their movement in the first place.

All we did was keep putting out fires. We've got to get beyond that which means we've got to move towards, "Do I have full range of motion? Am I moving well?" This doesn't mean I don't make errors from time to time and I don't challenge that. But, for example, if you squat or deadlift and you round or reverse and you know that your back is cooked, you can mobilize your back and deal with that piriformis but the best thing to do is not to be in it in the first place. So what we want to do is break that vicious cycle. The other issue we've got to look at is the environment load. As I'm sitting here and I say sitting with quotation marks – I've actually be squatting, I've been sitting in lotus, I've been sitting in middle splits – right now, I'm in a pistol position on my left foot – and what I've been doing is making sure that what's happening in my environment, my day-to-day, is not overcoming the background.

And so an example of this is that I saw someone in the hospital when I was a physio working at Kaiser and she was very, very sick, had a wound vac – this wasn't at Kaiser, it was at another hospital, Mills Peninsula – and she had a wound vac from a problem she'd had. And I was going up and doing physio with her for a half hour a day. That was what I was allotted as a physio. And I was a young student there. And what was happening was that she kept getting worse and worse. And what was happening was that she had orthostatic hypertension so that her blood pressure would drop out any time she stood up or sat up. And then we couldn't walk, and then the little walking that we were doing wasn't a big enough stimulus to overcome the amount of time sitting and laying in the bed. And what ended up happening is I ended up spending my breaks and I ended up spending my lunches going back in, getting her up, and squatting in this chair, and just getting enough to overcome the rest of her time because that half hour wasn't sufficiently robust to overcome the orthostatic hypertension that was setting in from her being so sedentary.

And I think that is one of the things that we've got to do is look at what's happening the rest of our lives. Because, if it's not making change, it may be making change but you're just changing faster than you can keep up with it. So you have two choices: you can either mobilize for an hour or make a better decision around your life and really try to clean up your mechanics. And I'm sorry – that's a tough question.

This is from David from New York. "What is the best position to sleep – i.e. on one's back or one's side?" The way to answer this question – because when you start messing with people's bed and their sleep postures... I had a guy on the internet once, he came onto the message board and he was like, "My spinal surgeon says I have to sleep..." and I was like, "Whoa. You've already had three spinal surgeries and you're trying to lecture us about the best position to sleep in?"

So the key here is that, if we look at what a good position is for your spine – an organized, braced position in standing, that active spinal shape, not forward, not rounded, not overextended, rib cage down – if I took away all the structures that were active to make that in place, then the thing would just have to stay in stasis or be organized in that position. And what ends up happening is we find that, when people go to sleep, they turn off. They can't brace anymore, they can't organize anymore – they don't have that structured support. And they default to the same people they are when they swim. They default to the same broken, overextended

people we see on the trampoline bouncing. And what we can start to say is, "I should be in a sleeping position that respects my spinal mechanics." And so, if you're jamming your hands underneath your neck, you need to get another pillow because you're using your hands as a pillow. That's a good indicator. "So how much pillow do I need?" You need enough pillow to support your neck so that your head is in the same position.

If you have a huge back, you're probably going to need thicker pillows. If you have a little tiny back, you probably need thinner pillows underneath your neck. You just need a neck roll or some pillow to support and to meet the anatomy to keep your spine aligned. So, suddenly, you can make any intelligent position about sleeping. Sleeping on your side is fantastic. Comma, if you drop that leg into that sleeping soldier and you're three-quarter turned and closing down the facets on your lower back, you're going to wake up stiff. So the idea here is, "Well, can I maintain or does my mattress facilitate a neutral position where I don't have to constantly burn out of a shape and move because my body's aching?" So the real issue is I have no problems with sleeping on your back. What we see a lot is the people that are sleeping on surfaces that are too hard for their structures can't lay on their backs. They have to flip one leg up and, if you always are flipping your right leg up when you're sleeping on your back underneath your left knee, guess what that's going to do to your hip? If you spend six hours in that position, you're going to really start to see that you get a weird capsular pattern that shows up.

The real problem I have is sleeping on your stomach. And I know, out there, you're like, "Oh, I sleep on my stomach. It's the only way I can go to sleep." Well, these are all trained positions, anyway. The only problem with sleeping on your stomach is how are you going to breathe? What you're going to see is that you're going to turn your head to the side and that means you're spending six to nine hours with your head cranked to the side, closing those facets down which is the position we test your neck in and your nervous system in when your body's pissed off and your neck is pissed off – clearing the neck by putting you into the sleep-on-your-stomach position. So as long as you have a hole in your mattress and you can maintain neutral and breathe through the hole, I am totally down with you sleeping on your stomach – I have no problem with that at all. Right? Just like you get a massage, you lay on your stomach – you've got to look through the hole. Otherwise, your neck is cranked to the side. That's the problem. So what we should be thinking is we can be more positioned diagnostic or we can be more spine-centric. "So am I sleeping in a position that facilitates a

neutral position? And, when I wake up in the morning, I should feel stinking great."

What I've found is that, as we move into more formal strength conditioning cycle – as athletes are sitting more and more being modern humans and walking less – I'm seeing and I'm feeling like people are becoming more extension sensitive. We're seeing Esther Gokhale just put out that piece on NPR – she's talked about this primitive posture versus... What we've seen is that people have ended up with exaggerated spinal curve – more forward in head and neck, more lumbar lordosis. And what ends up happening is that we see that people are sleeping on hard surfaces. And the reason we advocate it as an industry for much harder beds, people were herniated and, by sleeping on an extension, that ameliorated their herniation. What I see is that a lot of people are not sleeping well because they're extension sensitive, their mattresses are so hard, and they're extensional all night long. And when we put them into a little bit of flexion, they sleep a little bit better.

So I think the bottom line is you should wake up feeling great and you shouldn't have to be stiff on that first stretch. I've talked to a lot of people that it takes them a hot shower and 20 minutes before they start to feel like they could lift heavy. I think that's an issue for us. I think what we should be doing is we should be able to validate our sleeping position based on how I feel and I should be able to maintain the integrity of my spine. So that's all I have to say about that.

That's a big one. This is from Connor McClure of North Carolina. He says, "What supplements do you take on a daily basis and why?" So, for a long time, I was a big-time advocate of, "Eat food. Food's enough. Food, food, food," and what I found was, when I started getting really regular blood tests, was that I had some deficiencies. And when I had some genetic testing support that blood testing, I found out I wasn't getting some baseline things.

So I always feel better in the summer. I always feel better sunburnt. Well, it turns out I have chronically low Vitamin D. And I always take Vitamin D or else I nuke myself in the sun. It turns out that I don't process Omega-3s very well and I have doubled my Omega-3 dose to be able to see the needle move on the Omega-3s versus the Omega-6 ratio. So even though my ratios were within normal limits of good ratio of 3-6 – so I wasn't eating a lot of crappy Omega 6s – in order to bump up the fish oil, I had to up my fish oil a bunch. A little bit B12 low – I started taking some B12. Every once in a while, I get a B12 shot. That seems to really

upregulate the system a little bit. Let's see. Around other supplements, I think that a little cocktail for me of ZMA and 5-HTP – I don't have a neurotransmitter problem – but that 5-HTP and ZMA before I go to sleep really does make me sleep a whole lot better.

I take a great kick-ass multivitamin every day. I don't care where you get your – a food-based kick-ass multivitamin. I work with a company called Nutriforce. They make a really great multivitamin pack that I'm a fan of. And so I would say, on the surface, it looks like I don't take massive amounts of supplements but those are certainly supplements beyond food. And things come and go. Should I take some more Coq-10 when I see it? I take it and I think that's where to go. But the real issue is if you're supplementing a whole bunch of things just for the sake of it was didn't really respond with me. But when I got the blood tests and I found there were issues going on and there were some specific micronutrients that I could take that would change some of that, then I got on it and I seem to have much better blood testing as a result of it.

With my wife, Juliette, she has a faulty MTHFR gene so she doesn't process the folate is the way I understand it. And what we noticed was that she was always a little bit anemic because her B vitamins were super low – critically low – and when she got on the folate regularly, everything seemed to upregulate a little bit. And I think we're in a brave new world of actionable science and being able to handle some of those things. And I think that's the role of supplementation – very specific, very personalized supplementation. And companies like WellnessFX – Tim and a physician, Justin Mager, who's been on the show before – is really, really excellent, just for example. And he can steer us in the direction of saying, "Hey, here are very targeted things for your physiology." So that's a good question. I try to be obsessed about drinking enough water with salt. And I'm not saying it because I'm not a guys to overhydrate – if anything, I under hydrate. I think it's a problem.

This is from Coach McKenna in New York. She says, "What is the most important thing I need to do with my child to limit future mobility issues?" Well, what we like to think around kids are models saying, "Hey, kids have pretty rocking indigenous mechanics." Just watch any toddler squat and you'll know exactly what I'm talking about. So, at some point, we like to say that the tubes, or the conduits, are there through the wiring. Squatting is not a skill. It's just the way we move ourselves up and down. Right? That's the functional movement – primal movement pattern. The

idea is that we need to then reinforce that pattern with skill and repetition and so we need to pull the wires through the conduit. Around child health, there's a couple things. Getting your kids into some kind of formal movement practice – MMA, karate, jiu jitsu, dance, ballet, gymnastics, something like that. By the way, kids' yoga – we have a kickass kids' yoga program down the street.

Any way you're exposing your kids into full range motion and asking them to maintain those positions, I think that's a critical, critical way to think about that. We have to have... We give lip service to "Kids should exercise. Rah." And if they are playing – if they're jumping... I pick up my daughter, Caroline, from daycare and she parkours underneath three bars and jumps up onto the stairs and ends up in a big squat. A lot of the kids are playing in these indigenous positions, anyway. We can formalize that play by a little bit more or make sure we're touching those corners. And that should do it – that really should do it – but what we see is that kids... You've seen that, recently, we started a non-profit called "Standupkids.org." And what we've done is we've converted four classrooms – which is 100 desks – at our daughter's school to standing desks. And getting kids out of a rounded flexed spine sedentary position that they're adopting – what the research says – 12 to 14 hours a day, is profound.

So if you can limit the sitting, that is a gigantic game changer. And so our kids are standing. And when I say standing, they're leaning against the desk, they have a foot up on this bar that swings under the desk, their elbows are propped up on the desk. They're in these really, really great positions and staying there for about 14, 15 minutes before they move to the next task. They can sit on the ground. They can work on the ground. Basically, by getting kids out of the chairs, you're creating a movement-rich environment which, once again, doesn't violate the primary patterning system of the body which is short of being in constant motion. Getting your kids in flat shoes – gigantic deal. Don't systematically shorten your kid's heel chords. No wonder why they have crappy ankle range of motion one day. That's your fault. So get your kids Vans, get your kids Chuck Taylors. Get your kids into the flattest shoes you can find. Reebok is moving closer with their athletic shoes. They're at 4 mm of differential which is better.

Some of their kids' lines are flat. We've been killing them on it but they still haven't gone totally flat yet. But there are plenty of kick-ass kids shoes out there that are moving flat and they're going flatter. So I'd say flat shoes or barefoot as much as you can. And then, when you're at home, avoid postures that reflect the things

you're trying to kill. So if you're all hanging out, watching "60 Minutes" which is what we love to do on Sunday nights, we sit cross-legged on the couch or we sit on the floor leaning against the couch. But what we don't do is more sitting. Alright? Oh, here's a good one. This is from V in London. "What are your all-time favorite life-changing books? Explain how." Dude, when I moved to Germany in the beginning of second grade, I was an okay reader. I read a lot – my mom was psych professor. But, when I got there, I didn't have a TV and, to entertain myself, I started reading and I started reading voraciously.

And that, I think, was probably the single greatest thing that ever happened to me about moving to Europe with my parents was I lost TV. And my friends all had Atari's and VHS and I didn't. I just literally was a luddite again. And I read so much and I got so much into reading that my parents actually took me, at one time, to see if I needed glasses because I was getting eye strain from reading at night in the dark. So I discovered reading and I discovered that I was good at seeing messages – hidden messages. I was good at seeing patterns and concepts that affected my life. And I started reading, of course, you fall down the rabbit hole of anything that smells like the hero's journey. I think "Island of the Blue Dolphin" is a good example of a first hero's journey book I read. There's a book in middle school I read called, "Wyvern" that blew my mind about this young kid coming of age.

That sort of thing. And no wonder that when I read "Doon," which is a really classic hero story – "The sleeper must awaken" – that resonated with me. As I got on, I read a lot of nonfiction and I think, a lot of times, we read, sometimes, in our niche really heavily and we don't go out. So we end up siloing some of the information that we're seeing instead of seeing that people have already solved these problems somewhere else. Like "The Power of Habit" is an extraordinary book. "The Sports Gene" is an extraordinary book. "The Talent Code," an amazing book. Some of the sci-fi I read has really been informative. I'd say one of my favorite concepts of this – and I talked about this once – was "The Diamond Age," Neil Stevenson. And, in there, there's this technology in this book that grows with this guy's granddaughters.

And the idea is that the book teaches the girls allegory so that they simultaneously have to be perfect products of the system and they have to work to subvert and burn the system down while they're creating a new system. So it's those kinds of things that I'm like, "Hey, that matters to me." So I read widely, and variedly, and in a lot of different disciplines because it's amazing to see what

happens and how you're influenced by that. I was reading "Wired" magazine article a few years ago talking about breaking the speed record on sailboating because they get this wild cavitation – that happens at speed. And I was like, "Whoa. We see the same things happen to adults when they go too fast." So I think it's important to read widely and variedly, especially around the problems that are collateral problems because you can see and solve the problems you're doing because someone has solved them in another genre or another idea. Alright?

This is from Cinema. "What are the top three things I can do to maintain a functional mobility into my 80s and beyond?" Oh, easy. 1) Have a physical practice – that means a breathing practice. A bunch of people are discovering Wim Hof – Brian McKenzie brought me to that – really exaggerating breathing and down regulation practice. But, really, the yogis have been talking about that for a billion years. My friend, Joe Miller, all over me about mobilizing my diaphragm and the soft tissues in my gut. I'd say some kind of breathing practice that's part of my physical practice. You can't eat like an asshole – you just can't. Our good friend, John Welborn noticed that, when he ate clean, he felt like he didn't have to exercise as much. And I was like, "Well, that's probably true." You've got to sleep. Sleep, sleep, sleep, sleep, sleep, and then sleep some more.

I think you don't realize the impact it plays. People like to point out the outliers like, "Well so and so – Bill Clinton – only slept four hours a night," and I'm like, "Yeah, and Bill Clinton died of a heart attack." And so it's crucial that you just put the base things in place. There's a British cycling meeting – I forget who the coach was – and we had this concept called "Aggregation of Marginal Gains." And the idea was that they would take care of the tires, and take care of this, and all these little microperecents would aggregate into a two percent gain or a three percent gain. Well, the guy who used to be the director of performance for Garmin, his name is Allen Lim – he's a buddy of ours out of Boulder – and he's just a badass physiologist and has worked with the Finnies for ever and ever. He actually doesn't like that idea and I don't like it, either. He's thinks that there are just roadblocks to people's performance and the idea is just to undam that.

So your roadblock may be your sedentariness from your job, or your roadblock may be you're stressed out and don't know how to deal with that, or your roadblock – or dam, or bottleneck – is your nutrition, or your bottleneck is your breathing mechanics. So, by the time you just get to the bottom of whatever your bottlenecks

are, I think you find that we're all engaged in practices that are above 100 percent necessary. How much do you need to deadlift? "Strength is never a weakness." Well, that's true but if you can deadlift 500 pounds, you're probably strong enough to do almost everything except win a deadlifting competition or a powerlifting competition. That's a really big deadlift. So I think the idea is what we need to be doing is working towards economy and refinement of everything we're doing instead of just making the engine bigger and bigger which is what we're doing. Let's see. Oh, next set of questions.

"When you can't go barefoot," – this is from Mike Vinson in Memphis – "If you can't go barefoot, are minimalist shoes a good option? If so, what do you prefer?" So I think barefoot is king although it's creepy to be that barefoot guy all the time. And sometimes I go pick up my daughters at school and I'm barefoot and I'm like, "I am that guy right now." And the teachers know me, and everyone knows me, and they're like, "Hey, you're barefoot on campus," and I'm like, "Yeah, I came over from the house." No, I think the bottom line is the reason anti-fatigue mats work when we're standing on them is that we see that, in the anti-fatigue mat world, what's happening is, when you're standing there, you're making constant movements and you're bringing garbage out and groceries in because you're getting constant little small probations in your balance. Okay, that makes sense. If I'm standing static all the time, a cushy shoe is amazing but make it a flat cushy shoe. Right?

Because I'm a cashier and I just need to be balancing and wobbling. So the Nike Air flat shoe – 2 inches – go for it. But I think you should be in a constant state of movement so whatever shoe you're in should be just enough shoe to protect you from the environment. You should still feel what's going on with your feet so you don't bruise your toes, you don't bruise the ball of your foot but you still can cruise around. And, if you're running a long distance or in heavy duty trail, you probably need some more protection. And I think the idea is that there's not one perfect shoe. If I'm cruising around, be as flat as you can, be as thin as you can. Around my house, I rip out the insoles of all the shoes because I don't need it for padding. I maybe keep them in my running shoes but I don't keep that little liner in because I don't need it. So, as long as it's flat, as long as your feet are moving in the shoe a ton – there's a lot of flexibility in the shoes – I think you're golden until you can get barefoot again.

And our model is to be barefoot as much as you can. And if you need to ramp up and give yourself a little extra cushion or extra heel to compensate for patterns or bad mechanics, then that probably makes more sense. Let's see. We're at 50 minutes now. I'll take one more. "How did you approach educating your kids about correct movement practices? How old were they when you started and what difficulties did you encounter or overcome?" This is from Chris from Hong Kong. Well, at some point as parents, you teach your kids how to sleep and how to eat – why don't you teach your kids to walk with their feet straight? And you risk nagging your kids but you just have to make it about, "This is what we do." And showing your kids how to squat is what you do. So, if we watch TV... A long time ago, I used to be like, "Alright. We're going to watch it in a squat or you have to couch stretch."

And I think what ends up happening is that, certainly, your kids are going to mimic your behaviors but we teach positions that scale up infinitely so that positions that can go from a kid squatting with feet straight, to cutting, and jumping, and landing, to lifting heavier weights, and we don't keep going around the problem. We keep coming back to basics. And those positions also inoculate our kids from danger. So, if you jump down from a high step and your feet are straight or your feet are together when you land, the chances of you blowing a knee out are very low because you've blocked that position into a position to where you can handle the mechanics. Everything works right and your tissues function well. So the real issue is that, if you move like crap... Someone posted this great picture on crossfit.com of a guy carrying a bag and this kid carrying a bag – they're doing a sandbag carry – and they're both walking the same.

And the dad has got his foot turned out a ton and the kid has got his foot turned out a ton. I think we end up mimicking, unconsciously, a lot of our movement patterns and practices because that's what we see around us. And so cultivating that makes a difference – and just saying, "Hey, this is how we move." And what we're seeing is our kids need to get some form of movement training. CrossFit Kids does a great job. Again, gymnastics does a great job. Any formal movement practice is really teaching the mechanics because that's how we get safety and performance out of it. So getting kids into some formal thing like that really does well. But you can take your formal thing and teach kids pullups and plank and doing all that stuff. It's great. The problem is thinking it's A) going to get done somewhere else – I think you've got to take a little bit of responsibility for that and also show your kids what doing daily mobility looks like. Kids respond

so fast. If you teach your kids a couple things – how to smash out their calves on the roller, how to couch surf – they'll sort it out.

It's a little tricky, sometimes, because it's your kids and I think it's a fine line between, "Do as I say, not as I do," – and you can definitely be a movement Nazi – but your kids get it. They totally get it. And if they can see it – if my daughter can tell you if you overextend or stand with your manbelly hanging out, then I know you can do it, too.

So I think that's all we got. Oh, there's so many good questions here. Lots of them. Maybe Tim will have me back on. The bottom line is thank you guys very much. There is so much to talk about in the world of sports and performance and self-actualization and taking the lessons we're learning at the highest level of sports and performance and spinning it backwards. We say that it's got to be observable, measurable, repeatable, phenomenal. We have to see change within the visit and see lasting change between visits.

So we see intercession change and intrasession change. So I see change within the visit – intrasession – and between episodes – intercession. So that guides a lot of our thinking. And then, also, it's got to be inter and intra radar reliable. So it's not just me. I think people forget that we can apply real scientific rigor on top of our daily practice around clinician practice which is you – that's the N of 1. So if you're onto something that works, is it observable, measurable, repeatable? Does it work every time? Does it work when your friends do it? Does it scale if 40 plus people do it? What happens when you apply it to 10,000 people? So I think that's where we are right now is really demystifying, one-on-one, personal experience – really blowing it up into practices and best practices that sustain us as we, literally, are punching into the brave new horizon of human self-actualization.

And speaking of which, that is the heart and soul of this show and I think guys like Tim Ferriss have opened the door. My wife was able to quit her little... Personal anecdote, Juliette read "Four Hour Work Week" and was able to leave her job as an attorney and become CEO. And that's one of the reasons that I do these things for Tim – because he holds that over me because he got my wife out of the corporate law environment. Anyway, Tim Ferriss, thanks very much. You guys, thanks very much. We're in San Francisco – come visit us. We'll talk to you guys soon. Cheers.