Introduction and Guest Background

Welcome back to the conversation at the Restore Your Mitochondrial Matrix Summit. I'm your host, Laura, for Ontario. I'm bringing you experts to help you boost your energy and fix your health so you can build the life you love.

Today, my special guest is also a friend of mine, Kevin Ellis. Hi, Kevin, welcome to the summit. Laura, thanks so much for having. It's great to be here.

I am so glad you're here. This is really special for me for a huge reason. And for those of you who don't know this about me. You know that I'm a nurse practitioner, and I worked in the western allopathic medicine world since 1997, last 25 years.

I have spent over a decade in the osteoporosis field. And this is your specialty as well? I worked in an osteoporosis clinic, in fact, one of the largest osteoporosis clinics in the country, in the United States, and have treated a lot of osteoporosis in my career.

So it's really special for me to have you here because you literally, like, represent my roots, but you represent it in a way that's very different than what we do in the allopathic world.

So you are better known as the bone coach, and you're a certified integrative nutrition health coach, podcaster, YouTuber, bone health advocate, and founder of Bone coach.com.

And you have an interesting story. I want to hear a little bit about that. But you had a diagnosis of osteoporosis in your 30s, which is really rare because you've usually reached your peak bone mass.

At that point, you're as strong as you will ever be, and you actually healed your body and made it your mission to share how you did it. And you're dedicated to helping women with osteopenia and osteoporosis.

So welcome, welcome. Thank you so much for sharing your expertise and wisdom here. Thanks for having me, and I'm glad this is a topic that is getting some attention because really, it's it's a silent condition.

Osteoporosis is something that most people don't know about a lot of times until later in life when they may have a fracture, or maybe they saw their mother or their grandmother, or somebody else have a fracture, and that's really the extent of what they know about it until maybe that happens to them. Right.

So, it's really important and I'm glad we're going to talk about oh, yeah, the statistics are outstanding. One, 50% of women will have an osteoporotic fracture in their lifetime.

1 in 6 will break her hip. A quarter of those will die from the hip fracture. I mean, it's terrible statistics. Osteoporosis is a problem. And the Western medicine offers medications for this.

But there's some other things that you can do to support your bone health. So we're going to get into that today. We're going to get into what mitochondria have to do with this.

You know, everyone on this summit has heard me talk. And all the experts talk about how mitochondria are in every cell in our body. And your bone cells are no exception.

So we'll get into that and we'll really talk about what people can do. Will have you share some of your tips, and strategies so they can walk away from this talk today, really having some foundational ideas of how they can support themselves.

But you have quite an outstanding story of your own osteoporosis. Like I mentioned, it's unheard of for a 30 year old man. And, and a, a very physically fit man, a marine, to have osteoporosis.

So tell us what happened there and how you how you discovered it, what caused it and how you fixed it. Yeah. And I would just say I would start with my health journey, way before I was actually told that osteoporosis, it actually started before I was even born, when my mother was five months pregnant with me.

My father, was told he had cancer. Two months after I was born, he passed away. He was a marine as well. He did 22 months to Vietnam, survive combat.

Kevin's Osteoporosis Diagnosis and Recovery

And he made it home. But he got cancer from Agent Orange, and he passed away at a really, really young age of 35. So as I was growing up, obviously I knew I was going to be a marine.

But as I was growing up, I always had this fear in the back of my mind that, you know, from a health issues perspective that most likely I was going to pass away early.

I couldn't override that. And most likely it was going to be from some health issue that I didn't feel like I had control over. And as I got into my late 20s and I started having all these different health issues kind of coming to fruition, I wasn't sleeping well.

I had poor energy, you know, high stress. Some days I could barely even get out of bed. And then I, I was told I had celiac disease. So that's an autoimmune condition where, the ingestion of gluten damage is the villi.

Your nutrient absorption centers in the small intestine to the point where you can't actually absorb your nutrients or you do very poorly. And that was the situation that was taking place with me.

And as you're going about your daily life, you still need all those minerals and nutrients that you're not absorbing. So my body was essentially going to the bones to get those minerals from their greatest reserves.

And that's how I ended up developing osteoporosis in my early 30s. This is a super important concept, and I always teach this in my osteoporosis clinic.

Your body will rob Peter to pay Paul. And so your body literally stole nutrients. Your bones are a bank account of nutrients, and your body stole the nutrients from your bones to support all other cellular functions.

Absolutely. I mean, yeah, for calcium count, calcium is the primary mineral constituent of your bones. You need that for, muscle contraction. Nerve impulses, all these other things aren't muscle contractions.

I know. Right? Like every single day. But I wasn't absorbing them. And a lot of times, people that have digestive issues and they're not absorbing those nutrients, that could be something that leads to osteoporosis early on.

Yeah. So you figured out you had it. And then what did you do to resolve this problem? Yeah. So I you know, at this point in time when I was told I had osteoporosis, I also had young, young kids on the way too.

And I was I was living this nightmare that I never wanted to live. Right. I was I felt like I was in this situation that my father was in where he passed away really young.

Yeah. So I had this really strong motivation, which was to be the father minded, get the chance to be for me. And I went and I started doing all this reading and research and consulting with a lot of different people and spending a lot of money trying to figure all this stuff out.

And I almost became obsessed with it. And I finally started getting the right plan in place to improve my body, to improve my health, to restore my energy.

I was sleeping better. I was actually able to get out of bed in the morning and have a little bit of energy with me. And then I actually was getting to the point where I was resolving all my digestive issues and then the kind of the lagging indicators were improving my health and improving my bones.

And when I was going through this entire process, I realize that it is not the average 30 year old male that is told they have osteoporosis. It's usually the woman 40, 50, 65 plus that gets diagnosed unexpectedly in a lot of situations.

And they're given four different options take some calcium, take some vitamin D, go for a walk, and here's your bone drug. And that is woefully inadequate.

And that's really the reason why I went down this path of, becoming a coach in this area, bringing in a team of highly credentialed experts, building out and developing a program, you know, based on, on research and now having help people in over 1500 cities around the world.

That's so incredible. And I, I want to, I want to go into some quick, little simple, easy science about what's happening in the bone, and then, and then let's unpack for people some of the things they can do beyond those four things you just recommended.

Take calcium exercise, take a drug, take vitamin D, you know, walk. So tell us a little bit about what's happening in the body. What is osteoporosis or osteopenia.

And what's happening at the cellular level in the body. Yeah. So osteoporosis literally means porous bone.

Understanding Osteoporosis and Bone Quality

And it's a condition characterized by either not enough bone formation, excessive bone loss, or it's a combination of the two of those things. And in osteoporosis, both your bone density and your bone quality are reduced.

And that's going to increase your risk of fracture. And the way you find out you have osteoporosis is through what's called a Dexa scan, dual energy X-ray absorption geometry.

It's painless. It's kind of like an X ray. Very low levels of radiation. You lay down, there's a scan, and it tells you your bone mineral density, the actual mineral content of your bone.

And then, it generates a score. And that score is called a T score. Right. And the T score is comparing your bone mass to that of a healthy, approximately 30 year old adult.

And if you have a score of plus one, 0 or -1, that's considered normal and healthy, right? If you've got a score of -1 to -2.5, that's considered osteopenia.

Also low bone mass, which is like a precursor to osteoporosis. And then -2.5 and lower. So -2.6 -2.7. So on and so forth. That's considered osteoporosis.

And the greater that negative number becomes the more severe the osteoporosis. Now most people who are getting these tests, they're they're going to be women, 50s, 60s, you know.

But in my opinion, that's that's too late to be getting that test right. I would always encourage people, especially if you're listening to this and you yourself have not had a bone density scan or you've got you know, a young daughter or someone else in your life that has not had one yet.

I would encourage you to go get one of those, so you at least have a baseline from which to monitor future changes. So that's really understanding how you may have that osteoporosis diagnosis.

Come with me. Now what's actually going on inside the cell. So you have different types of cells within your bone.

Just focus on the major ones right.

You have osteocytes which are cells that are like they're like mechanical signals. Basically, they understand and can communicate to other cells of what's going on.

You have osteo class, which are cells that break down and restore bone, and then you have osteoblasts, which are bone building cells. And all of these work together to remodel our bones over time.

And it's a natural process of bone breakdown and bone building throughout our lives, like our skeleton is constantly turning over. And what's really interesting about our bones is they're not just this rigid structure.

They actually have quite a few different functions. They're an endocrine organ, and they're not only supporting us and holding us up and helping us move, they're also providing protection for vital organs.

They're they're helping with blood cell production and maintenance, which is super, super important. Red blood cells, white blood cells, platelets and they serve as nutrient storage, calcium, phosphorus, even specific growth factors like insulin, insulin, like growth factor, IGF one, they're housed in the bone and then they're released periodically.

So it's actually living tissue that you have. It is and there's this whole piece to, I would add about bone quality that is not measurable in a bone density test.

And I'm sure you work with people who have maybe had a vertebra fracture or a hip fracture, and their bone density is normal. That's still a diagnosis of osteoporosis because they've had a fragility fracture.

Absolutely. So when you get that Dexa scan, that bone density scan we just talked about, you only have in most situations. You only have part of the picture.

Bone density tells you it's how much mineral content is in your bones, right. The actual mineral content of your bone. But the other part of the picture is bone quality.

And that is the micro architecture, the structural integrity, how that bone is organized. So bone density and bone quality combined to create bone strength.

So a lot of times you only have part of the picture. Now there is an add on software to Dexa that you can get. It's called TBS or Trabecular bone score.

And what this software tells you is it can actually give you a measure of your bone quality. Now, not every single facility has this. Nope. And not all physicians are, familiar with its interpretation also.

But you you can ask for it. And that would be, you know, a more whole and complete picture. And just like you said, I've seen situations where somebody's got by by Dexa scan score, osteopenia, negative ones, but they've got poor bone quality and they've fractured five, six, ten plus times.

Right. That can happen. I've also seen the other side where somebody may have negative three bone density and if never fractured and bone quality is absolutely playing a role in that picture.

Absolutely, absolutely. And while we're talking about fractures and breaks, just for everyone to understand fracture and break mean the same thing. I you hear it all the time.

I didn't break my bone, fractured it. And so fracture is the medical term. Break is the layman's term. There's different categories of fractures that can be very small and microscopic, or they can be compound and break all the way through.

So it's a fracture. Yep. And and in terms of fractures too, it's not it is not normal for someone to be doing, you know,

a light activity and not have some traumatic experience to then go fracture a specific bone.

So that can also be an indicator of poor bone quality as well. If you're having a non-traumatic fracture, you obviously you need to go take the next step to get that investigator next for effort.

Yeah. And even light trauma. So you're walking a long trip on a parking berm, you know, reach out with your wrist and and break your wrist. That's low trauma.

If you fall off a six foot ladder and break your wrist, that's high drama. Yeah, yeah. So so we're established. This is pretty important because fractures require repair.

A lot of times they require surgery. The operating table is a dangerous place to be. And then there's this whole quality of life. If you're fracturing vertebrae and you're condensing spine and you're now you're now getting hunched forward, you're condensing the space that you have for the organs.

It's a lot of problems. So why is it that the standard treatment, protocol for osteoporosis isn't enough, in your opinion? Well, usually that standard treatment protocol, it only contains four things, right?

Calcium, vitamin D, walking and a bone drug. And sometimes it's only the bone drug. Right. And the bone drugs, these are not like, they're not like taking an aspirin.

They have a dramatic effect on bone physiology. Now there are different categories of bone drugs. And they are supposed to do different things within the body.

So you've got anti active medications. And the role of these medications is to slow down the activity level of cells that break down bone for the most part.

And there are two different types of of drugs.

Root Causes: Hormones, Medications, and Gut Health

Within that there are bisphosphonates which is fosamax falls under that category. Right. That's what a lot of people are familiar with. And then there's also ranked like inhibitors, like prolia.

And then you have a whole nother type of bone drug called anabolic. And these drugs include drugs like potato. So affinity and there are some other ones, but those drugs have a specific length of time that you use them.

They're usually being proposed. If somebody has poor quality bone and they've already fractured, you know, multiple times. But once you take that medication, you have to follow it with another medication, a resort to medication.

Absolutely. So a lot of times when you start on one of these medications, it's not like you're just going to take this for a short stint and then it's you're going to be done with it.

There's going to be multiple medications usually that come after the other. And they're not without their side effects and their short and long term implications of use.

So it's whenever that's proposed. If you're in the office and you get this diagnosis before you just jump into a medication out of fear and uncertainty and not knowing, pause, take a deep breath and realize there's probably more to the picture you don't just yet understand.

So that's when we need to do maybe some more lab testing to figure out if there are other root cause issues contributing to bone loss right now. A lot of times when you get that bone density scan, yes, it tells you what your bone density is at that point in time, but you cannot tell if you are still actively losing bone right now.

Right? So one of the tests that you have to then go ask your physician for are, there's one test called the CT low peptide test, or the serum CT test.

That's a blood test. And that looks at the activity level cells that are breaking down bone. And if that activity level is elevated, that can be an indicator of active bone loss and a root cause issue that needs to be addressed.

There's also, urine and or serum and those are MT low peptide tests. And again, that's looking at the activity level of cells that break down bone. And when you look at that part of the picture, the bone breakdown side, you also want to look at the bone building side of the picture as well.

And that's where we've got these other bone turnover markers. There's one the most sensitive bone formation marker is called P1 and P. It's pro collagen type one N-terminal Pro peptide.

And that's a blood test. And again that looks at the activity level of cells that are building up bone. And then there's also osteo calcium and bone specific alkaline phosphatase.

So when you go get maybe a comprehensive metabolic panel like a lot of people get when they get lab testing done, there's a test in there called alkaline phosphatase.

And if that's elevated that elevation could be coming from, you know, the gut or the bone or somewhere else in the body, the liver. And we need to go explore if that's related to the bone as well.

So those are just some helpful tests that can help you understand that picture a little bit better. Can you? That's really helpful. And can you explore, with our audience, what are some of the causes of osteoporosis are because, you know, we hear a lot.

Well, it's my genetics, but what else? I mean, we know definitely estrogen depletion in women is detrimental to bone speeds up that bone loss. That osteo classic activity gets faster.

So what else could be going on though, that perhaps we're not looking at in the allopathic western world? What are some other root causes? Yeah. So there a lot of people don't know this.

There are actually multiple types of osteoporosis. There's primary osteoporosis. That's what you were just talking about, which is as the decrease in estrogen in postmenopausal women, estrogen has that protective effect on bone.

As estrogen levels decrease as they do during menopause, that causes that increase in the activity level of cells that break down bone. But then there's a whole nother cause of osteoporosis.

And that's called secondary osteoporosis. That's the category I fell into. And that's category a lot of people fall into if they're in their 30s or 40s or 50s and they're unexpectedly diagnosed.

And secondary osteoporosis occurs because of conditions, behaviors, disorders, diseases, medications, all of these things can contribute to bone loss and osteoporosis.

I'm going to talk about some of those specific causes that are more common in just a second. But what I want to point out is just because you're a postmenopausal women does not mean the loss of hormones is the only cause of your bone loss.

So I hear this a lot of times when people come to me and they say, oh, my doctor just said it's a natural part of aging, or I'm postmenopausal, this is supposed to happen.

There could be something else contributing to that. And we have to explore. You cannot make assumptions. You have to make objective decisions. Okay. So let's talk about some of the actual causes that are probably a little bit more common.

I want to start with medications. Right. Because medications are can be one of the contributing factors to bone loss. And there is a medication specific, specific early, prednisone and cortisone that people use.

These are glucocorticoid steroid medications that are designed to suppress inflammation. And what they're doing is they're mimicking natural steroid hormones that are produced by your body.

And they're often used to treat conditions like asthma or autoimmune diseases like rheumatoid arthritis. And what it's doing is that will actually contribute to bone loss.

Those drugs will contribute to bone loss. And the reason that is, is that it reduces your GI absorption of calcium. It increases your urinary excretion of calcium.

So that's going to create a deficit. And then the glucocorticoids themselves are directly acting on those osteoclasts those bone reserving cells. And they're going to increase their lifespan which is going to contribute to bone loss.

So that's a big medication. Just know that will be a side effect if you're on that medication. Absolutely. Without a doubt. And yeah, specifically five milligrams a day or worse or higher is for oral prednisone is the big concern.

Yeah. Yeah. And another one that a lot of people, don't know is selective serotonin reuptake inhibitors SSRI, that's a class of drugs are typically used as antidepressants.

And there was one review of 19 studies on the effects of SSRI that indicate they do, in fact, have a negative effect on, bone mineral density and they will increase the risk of fracture.

And then another one are antacids. This would be your I know you've seen this so much proton pump inhibitors, your H2 receptor antagonist drugs like Zantac or nicotine, omeprazole, Nexium prevacid.

What these drugs do is they're designed to, you know, lower or suppress your stomach acid, basically. And a lot of times when people are taking them, they're actually the problem that they actually have is too little stomach acid, not too much stomach acid.

So they're suppressing what little stomach acid they do have. Why is that a problem? Because you need stomach acid to properly break down and extract nutrients from your food, like amino acids, right?

The building blocks of protein, your bones, they are 50% protein by volume. So you need it that you need this constant by amino acids, magnesium, iron, B12.

If you have low stomach acid and you continue to suppress it, you're stuck. You're going to be starved of those nutrients. Basically, there are plenty of studies that indicate long term use of these drugs are not going to be good for your bones. So. Right.

So lots of drugs, what comes to mind? Anticonvulsants therapy. You know, lots of lots of prescriptions. What other non pharmacology or pharmaceutical.

Excuse me. What are their non-pharmaceutical causes of osteoporosis. This let's go with the let's go with the GI contributors. Right. So we've got celiac disease which I talked about earlier.

So that's autoimmune condition damages the villi your nutrient absorption centers. So you've got these blunted nutrient absorption centers that can't absorb those nutrients.

That's one contributor. But also Crohn's disease, ulcerative colitis. You even small intestinal bacterial overgrowth can damage like, lead to, damage of the like, too.

So you can have other things that are contributing to the damage of the like or, preventing you from absorbing nutrients. So the nutrient absorption is going to be a major contributor.

If somebody is not getting the nutrients, that's going to be an issue. And what say you about toxins? We've talked a lot about toxins on this summit. Toxins being really bad for mitochondria and all cells.

And really deficiency is created by toxicity in my opinion. So what is your take on toxins? Well I'll, I'll start with one, one what I would consider a toxin, at least for your bone health.

And I'm sure many people have already mentioned why you should not consume excess amounts of sugar or sugar in high amounts. But if you haven't heard it for bones, I'm going to give you a reason for bones to.

Let's hear it. Sugar damages your bone by triggering an inflammatory response. It's going to lower your vitamin D levels. It's going to deplete your bone.

Healthy minerals, your calcium, your magnesium, your chromium, your copper. It's going to inhibit your intestinal absorption of calcium. And this is a big one.

It's going to block your absorption of vitamin C and vitamin C is key for maintaining a healthy skeleton. So I'm not just talking about, you know, your your white sugar I'm talking about your breads, your cakes, your cookies are cracked, pizzas processed, all that kind of stuff.

Toxins, Sugar, and Water Quality

So really important to to make sure you're not consuming those things. I'm sure that one's been hammered home plenty. Well, we can't hear it enough. I know myself included, has a sweet tooth.

So, I mean, I'm a practitioner, and it's a choice every day to not have sugar. Yeah. Yeah. So. And then then one of the other ones, an actual I would consider you know, chemicals to are a big issue.

Glyphosate is obviously a broad spectrum herbicide, a crop desiccant that's sprayed on, on around certain foods. Getting organic is so important because not only is glyphosate going to be increasing your risk of cancer and, you know, it could be contributing to autoimmune conditions as well.

And those are obviously going to lead to inflammation that contributes to bone loss. So it's it's like an indirect effect. There. But also glyphosate is a key later of minerals.

And you need those minerals to support healthy bones. So I would always use the environmental working groups like if you don't already have a good guideline for that, use the environmental working groups, Dirty Dozen, clean 15.

Figure out what you can do organic for your budget, and then you know what's okay to not do organic for your budget. Also gorg for everybody listening.

It's a great resource for not just food, but for body products, cleaning products, literally everything. Yeah, let's let's go to layer deeper with that, with talking about unfiltered water too, and the importance of that, because if you're drinking unfiltered tap water, there's a good chance you're consuming 300 plus chemicals and pollutants that the Environmental Working Group specifically points out.

You know, we've got volatile organic compounds, heavy metals, pharmaceuticals, endocrine disrupting chemicals, chlorine, fluoride, all these things. So if you go to wget org forward slash tap water and you type in your zip code, that's going to give you a list of contaminants detected in your tap water.

And then you can take steps to to remedy that. Right. You can go like a Berkey filter or a reverse osmosis filtration system with a mineral or something like that.

So that way you're not taking in all those toxins and and chemicals. Yes. And don't think your refrigerator filter is doing the trick, everyone. It is. Yeah.

If you get the arrow, you gotta hook it up so that the refrigerator water gets it, too. I know, I know, so I distill my water. That's a game. And use, liquid minerals by cell core.

And, when we travel, I even drink distilled water. It's so clean. Yep. Good. Okay, so we've talked a lot about causes of osteoporosis, and you can learn more from Kevin at Bone coach.com, because there's even more.

But for the sake of time and all the things we want to cover on this talk, let's hear it about exercise. I mean, tell us the truth. Is walking enough for your bones?

I'm going to tell you walking is not enough. All right, so part of that prescription that I was saying most people get when they go into their, their office is calcium, vitamin D, walking bone drug.

You know, you need a lot more than just walking. So walking is good for your health. Habit is part of your plan. But understand that you need two different types of stimuli stimuli for your bones.

You need muscle pulling on bone and you need impact. And the most effective interventions are going to use one or both of those things in combination.

So what happens is when you have muscle pulling on bone, you have this mechanic signal that's sending a chemical signal to tell those bones to become stronger.

Right. So the you you're not having that if you're just walking now, weight bearing exercise is, that's really important. That's any kind of exercise where you're your body, your bones, your muscles, they're they're working against gravity to keep you upright.

That's placing a good stress on your bones. And you do want to incorporate that. So that's your walking, your jogging, your running, your dancing, your gardening, playing soccer with the kids or grandkids, you know, whatever that is.

That's great. And people always think weight bearing is lifting weights. Weight bearing is bearing your weight on your feet. So how you're moving around the planet, that's the weight bearing.

Yeah. And that's good. Right. You want to incorporate weight bearing exercise. But there's also non weight bearing exercise. And this would be things like cycling swimming water therapy paddling or kayaking or canoeing.

Now those things are not placing that healthy stress on the bones that we need.

Exercise, Bone Remodeling, and Mitochondria

So I don't tell people like if you love to ride your bike and it brings you joy and it reduces your stress. Same thing with kayaking or swimming. And you love hanging out with your family in the pool.

That's great. Don't give those things up. But don't overdo it. And also, if that don't count, that is your only form of exercise because it's not going to be enough, okay?

You have to have that healthy stress on your bones. And that brings in the next part of this picture for exercise, which is muscle strengthening and resistance training.

Right. So you can use heavy resistance bands. You can use dumbbells. You can use barbells. And you know, you want to be providing enough intensity and stimulus that's going to help your muscles and your bones grow and become stronger.

So Doctor Belinda back, she she ran a Livermore trial, in Australia. She's done a lot of great research with exercise, and they work with people and did overhead press, deadlifts, squats, chin ups with drop landings.

Those were all shown to be safe and effective for the subjects, at least they used in those studies. And the the intensity range that we want to be doing when we're doing those types of exercises is in that 5 to 10 repetition range.

Now, if you're listening to this or watching this right now and you're like, okay, let me go watch a YouTube video and go crank out some deadlifts, I'm going to tell you right now, just don't don't go do that and try to get up to that intensity really fast.

You probably want to get get to somebody who can evaluate your body mechanics, see if you're doing things properly, and then go slow and steady, slow and steady progression up to where you're reaching the intensity that you need.

Because bone remodeling is not done in two weeks, right? Just because you go give it two really hard workouts, or you think stomping on the floor for two weeks is going to do it, I'm telling you what, it's not going to do it right.

You need a longer time period for that next time. So be patient with yourself and so slowly, so tell us what's happening. So when you're bearing your weight walking, jumping, jogging type exercises, you're stimulating those mechanoreceptors to tell those osteoblasts to get to work.

Right. What's happening when you're doing the, do you call it muscle pulling bone muscle pulling on bone exercises? Yeah, muscle. Muscle pulling on bone.

You've got that mechanical signal that's sending the chemical signal to tell those bones to become stronger. But, you know, every day is, as all of us are going about our daily lives doing exercise and moving about all of us.

This is a normal part of the bone remodeling process, is where we're getting these tiny little micro cracks in our bones. And what happens is you have these sensors within your bones called osteocytes that sense that damage.

And they send out a signal. That signal is communicating to the osteoclasts, the cells that break down bone. Hey, we've got some damaged bone. We need to come clean this out.

So what happens is that it's a coupled process. Asset class come in. They scoop out that damaged bone. And then what happens. We have these osteoblasts that follow and they come and they build and lay down stronger healthier bone.

So that is normal part of remodeling. We need that. Let's go back to the the bone drug treatments we were talking about earlier. When you have a bone medication that slows down the activity level of cells, too much, what can happen is you can start to have an accumulation of those tiny little micro cracks and fractures because you need to have that, the bone breakdown cells come and scoop out that damaged bone.

But if you slow down that activity level too much, you can start to accumulate that old, worn, damaged, weakened bone. And that can lead to weaker bones over time.

So that's kind of closing, bringing that full circle. Yeah. And then one more a little bit there. So talk about the mitochondria with those osteoclasts and osteoblasts.

Let's bring it home with those because we are on the mitochondria summit. And so okay. So mitochondria play such an important role in our bone health that they're essential for maintaining those osteoblasts, those bone building cells, the Ace2 class your bone breakdown cells and the myocytes in the muscle.

And when you have mitochondrial dysfunction that's going to impair that osteogenesis, that that bone formation process. And it's going to increase the activity level of cells that break down bone, which is going to accelerate that bone loss.

And part of the reason for that is when we have a compromised energy metabolism and we have oxidative stress

that's going to contribute to age related stem cell dysfunction in the bone.

And then we have my TOF AG, which is it's a key to keeping the cells healthy. And it promotes turnover of mitochondria and prevents the accumulation of these dysfunctional mitochondria.

And that in turn is playing a role in the proliferation, the differentiation and the function of these osteoblasts and osteoclasts. So really we need to be focused on how we can support this, you know our musculoskeletal health.

So and the plenty of research out there that's going to suggest and anti-inflammatory diet with plenty of protein, exercise supplementation proper supplementation with things like vitamin D, omega three fatty acids, probiotics, even all of these things have been shown to have a positive effect on muscle strength, bone density, and bone quality.

This is so good. So there are so many. I mean, we could have a part two discussion. We haven't talked deeply about supplements, but here's the deal. You can go to bone coach.com.

And Kevin has all kinds of free resources and information you can get on his email list. He will send you emails every day full of incredible information.

And, and you really are an expert in which supplements to take which ones are kind of all hype and not really worth it, and which ones actually do the job.

What's worth your time? Your knowledge of bone health is extraordinary, Kevin. I mean, I studied for, for two decades to be where I'm at in the osteoporosis world.

And you are, you know, all the things. So it's so impressive. I just just congratulate you for how far you've dug into this. You speak just like any expert speaker I would here at a medical conference on osteoporosis.

So thank you for your contribution to this. You you just shared so many pearls on this on this interview. So thank you for that. Well, thanks for having me.

And I'm really glad you know, that we get to have a discussion about this, because it is a condition that most people don't focus on or hear about until later on in life.

And I always tell people, we want to be on the side of prevention, not reaction, right? It is so much easier to slow and stop and prevent more bone loss than to build it.

Once we lose it all it possible, you know you can build bone strength at any age. There is hope to do that. It just becomes more challenging the older you get and the more bone you lose.

There are fewer cells involved in that process. It becomes less efficient. So, be on the side of prevention, be patient with yourself, be kind of yourself along the way.

And, that's that's the most important stuff. It is. It is. And it's never too late, no matter where you're at in your bone journey. Final thought that I want to say is Kevin and I on this summit are not here to tell you to take medicine or not take medicine.

That's a discussion between you and your doctor if if prescription medicines are right for you. But what Kevin can offer you is all the other things that you can do to support your bone health, that whether you take medication or not, will be a complementary therapy?

Absolutely. And I always say, regardless of whether you take the medication, you still have to do everything that we teach, identify in addressing root cause issues.

You have to start there, right? And then you have to understand what your lab results mean when you get those

things back. And then you have to be able to address those underlying issues so you can make sure you're not losing more bone.

Then you have to nourish your body and restore the nutrients that you need through diet, through digestion, through absorption. And then you have to build strength of body, mind, and bone in a way that prevents fracture and injury.

So you got to reduce your stress, improve your sleep, optimize your hormones, get the right exercise plan in place. All of those things happen outside of whether you take a medication or not.

Absolutely. That is a great place to end. Mike. Drop Kevin, thank you for being here. Thanks for having me. I see everybody bye bye.