Osteoporosis: The Little Known Connection Between Mitochondria, Bone Loss And Fractures Plus What To Do About It

Laura Frontiero, FNP-BC interviewing
Kevin Ellis

Laura Frontiero, FNP-BC
Welcome back to the conversation at the Restore Your Mitochondrial Matrix Summit. I'm your host, Laura Frontiero. 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.

Kevin Ellis
Laura, thanks so much for having me. It's great to be here.

Laura Frontiero, FNP-BC
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, you know, 1997, the 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 bonecoach.com. And you have an interesting story. I wanna hear a little bit about that, but you

had a diagnosis of osteoporosis in your 30s, which is really rare 'cause you've usually reached your peak bone mass at that point and you're as strong as you'll 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.

Kevin Ellis
Thanks for having me. And I'm glad that this is a topic that is getting some attention because, really, 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 getting to talk about it.

Laura Frontiero, FNP-BC
Oh yeah, the statistics are outstanding. 50% of women will have an osteoporotic fracture in their lifetime. One in six 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 gonna get into that today. We're gonna get into what mitochondria have to do with this. You know, everyone on the 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. We'll 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 a very physically fit man, a Marine, to have osteoporosis. So tell us what happened there, how you discovered it, what caused it, and how you fixed it.

Kevin Ellis
Yeah, and I would just say I would start with my health journey way before I was actually told I had 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, survived combat, 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 gonna 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 gonna pass away early. I couldn't override that. And most likely, it was gonna 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 kinda 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 was told I had celiac disease. So that's an autoimmune condition where the ingestion of gluten damages 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.

Laura Frontiero, FNP-BC
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.

Kevin Ellis
Absolutely. I mean, yeah, for calcium. Calcium is the primary mineral constituent of your bones. You need that for muscle contractions, nerve impulses, all these other things.

Laura Frontiero, FNP-BC
Heart muscle contractions.

Kevin Ellis
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.

Laura Frontiero, FNP-BC
Yeah. So you figured out you had it and then what did you do to resolve this problem?

Kevin Ellis
Yeah, so you know, at this point in time, when I was told I had osteoporosis, I also had young kids on the way too. And I was living this nightmare that I never wanted to live, right? I felt like I was in this situation that my father was in where he passed away really young. So I had this really strong motivation, which was to be the father that mine didn't 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 realized 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 research, and now have having helped people in over 1,500 cities around the world.

Laura Frontiero, FNP-BC
That's so incredible. And I wanna go into some quick, little simple, easy science about what's happening in the bone. 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?

Kevin Ellis
Yeah, so osteoporosis literally means porous bone. 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 gonna 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 absorptiometry. It's a painless test, kinda like an X-ray. Very low levels of radiation. You lay down, does 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 +1, zero, 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 gonna be women, 50s, 60s, you know, but in my opinion, 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 to be. Now, what's actually going on inside the cell? So you have different types of cells within your bone. I'll just focus on the major ones, right? You have osteocytes, which are cells that are like, they're like mechanical signalers basically or they understand and can communicate to other cells of what's going on. You have osteoclast, which are cells that break down and resorb bone. And then, you have osteoblast, 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 in holding us up and helping us move, they're also providing protection for vital organs. 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-like growth factor, IGF-1, they're housed in the bone and then they're released periodically. So it's actually living tissue that you have.

Laura Frontiero, FNP-BC
It is. And there's this whole piece too, I would add, about bone quality that is not measurable on a bone density test. And I'm sure you work with people who have maybe had a vertebral fracture or a hip fracture and their bone density is normal. That's still a diagnosis of osteoporosis because they have had a fragility fracture.

Kevin Ellis
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 microarchitecture, the structural integrity, how that bone is organized. So bone density and bone quality combine 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, and not all physicians are familiar with its interpretation also, but-

Laura Frontiero, FNP-BC
That's true, yeah.

Kevin Ellis
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 DEXA scan score, osteopenia, -1s, but they've got poor bone quality and they've fractured five, six, 10 plus times, right? That can

happen. I've also seen the other side where somebody may have -3 bone density and have never fractured, and bone quality is absolutely playing a role in that picture.

Laura Frontiero, FNP-BC
Absolutely, absolutely. And while we're talking about fractures and breaks, just for everyone to understand, fracture and break mean the same thing. I hear it all the time, "I didn't break my bone, I fractured it." And so fracture is the medical term, break is the layman's term. There's different categories of fractures. They can be very small and microscopic, or they can be compound and break all the way through. So it's a fracture, yep.

Kevin Ellis
And in terms of fractures too, 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, obviously, you need to go take the next step to get that investigated and explore that further.

Laura Frontiero, FNP-BC
Yeah, and even light trauma. So you're walking along, trip on a parking berm, you know, reach out with your wrist and break your wrist. That's low trauma. If you fall off a six-foot ladder and break your wrist, that's high trauma. Yeah, so we've 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 the spine and you're now getting hunched forward, you're condensing the space that you have for the organs, that's a lot of problems. So why is it that the standard treatment protocol for osteoporosis isn't enough in your opinion?

Kevin Ellis
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 antiresorptive 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 drugs 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 RANK-Ligand inhibitors like Prolia. And then, you have a whole another type of bone drug called anabolics. And these drugs include drugs like Forteo, Evenity, 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, an antiresorptive medication.

Laura Frontiero, FNP-BC
Absolutely.

Kevin Ellis
So a lot of times, when you start on one of these medications, it's not like you're just gonna take this for a short stint and then you're gonna be done with it. There's gonna 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, 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 C-telopeptide test or the serum CTx test. That's a blood test, and that looks at the activity level of 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 NTx or a serum NTx. Those are N-telopeptide tests. And again, that's looking at the activity level of cells the 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 P1NP. It's procollagen type 1 N-terminal propeptide, 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 osteocalcin 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.

Laura Frontiero, FNP-BC
That's really helpful. And can you explore with our audience what 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 osteoclastic 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?

Kevin Ellis
Yeah, 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 that's 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 another cause of osteoporosis, and that's called secondary osteoporosis. That's the category I fell into, and that's the 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 gonna talk about some of those specific causes that are more common in just a second. But what I wanna point out is just because you're a postmenopausal woman 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 wanna start with medications, right? Because medications can be one of the contributing factors to bone loss. And there is a medication, specifically 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 expiration of calcium, so that's gonna create a deficit. And then, the glucocorticoids themselves are directly acting on those osteoclasts, those bone-resorbing cells, and they're gonna increase their lifespan, which is gonna contribute to bone loss. So that's a big medication. Just know that will be a side effect if you're on that medication.

Laura Frontiero, FNP-BC
Absolutely. Without a doubt and specifically five milligrams a day or higher is for oral prednisone is the big concern, yeah.

Kevin Ellis
Yeah. And another one that a lot of people don't know is selective serotonin reuptake inhibitors, SSRIs. That's a class of drugs that are typically used as antidepressants. And there was one review of 19 studies on the effects of SSRIs 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,

Laura Frontiero, FNP-BC
That's one.

Kevin Ellis
your H2-receptor antagonist drugs like Zantac, ranitidine, omeprazole, Nexium, Prevacid. What these drugs do is they're designed to, you know, suppress your stomach acid basically. And a lot of times when people are taking them, 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 this constant supply of amino acids. Magnesium, iron, B12, if you have low stomach acid and you continue to suppress it, you're gonna be starved of those nutrients basically. And there are plenty of studies that indicate long-term use of these drugs are not gonna be good for your bones.

Laura Frontiero, FNP-BC
Right. So lots of drugs, what comes to mind, anticonvulsants, chemotherapy, you know, lots of prescriptions, what other non-pharmacology or pharmaceutical, excuse me, what are other non-pharmaceutical causes of osteoporosis?

Kevin Ellis
Let's go with the GI contributors, right? So we've got celiac disease, which I talked about earlier. So that's an 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. Even small intestinal bacterial overgrowth can damage, like lead to damage of the villi too. So you could have other things that are contributing to the damage of the villi or preventing you from absorbing nutrients. So the nutrient absorption is gonna be a major contributor. If somebody's not getting the nutrients, that's gonna be an issue.

Laura Frontiero, FNP-BC
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?

Kevin Ellis
Well, 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 gonna give you a reason for bones too.

Laura Frontiero, FNP-BC
Let's hear it.

Kevin Ellis
Sugar damages your bone by triggering an inflammatory response. It's gonna lower your vitamin D levels. It's gonna deplete your bone-healthy minerals, your calcium, your magnesium, your chromium, your copper. It's gonna inhibit your intestinal absorption of calcium. And this is a big one, it's gonna 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 white sugar. I'm talking about your breads, your cakes, your cookies, your crackers, pizzas, pastas, all that kind of stuff. So really important to make sure you're not consuming those things. I'm sure that one's been hammered home plenty.

Laura Frontiero, FNP-BC
Well, we can't hear it enough because-

Kevin Ellis
I know.

Laura Frontiero, FNP-BC
Myself included has a sweet tooth. So I mean, I'm a practitioner, and it's a choice every day to not have sugar.

Kevin Ellis
Yeah, yeah. And then, one of the other ones in actual I would consider, you know, chemicals too are a big issue. Glyphosate is obviously a broad-spectrum herbicide, a crop desiccant that's sprayed 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, could be contributing to autoimmune conditions as well. And those are obviously gonna lead to inflammation that contributes to bone

loss. So it's like an indirect effect there. But also, glyphosate is a chelator of minerals, and you need those minerals to support healthy bones. So I would always use the Environmental Working Group's, like if you don't already have a good guideline for that, use the Environmental Working Group's 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.

Laura Frontiero, FNP-BC
Ewg.org for everybody listening. It's a great resource for not just food but for body products, cleaning products, literally everything, it's great.

Kevin Ellis
Yeah, and let's go 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 ewg.org/tapwater and you type in your zip code, that's gonna give you a list of contaminants detected in your tap water. And then, you can take steps to remedy that, right? You can go get like a Berkey filter or a reverse osmosis filtration system with a remineralizer, something like that. So that way, you're not taking in all those toxins and chemicals.

Laura Frontiero, FNP-BC
Yes. And don't think your refrigerator filter is doing the trick, everyone. It is not.

Kevin Ellis
Yeah, if you get the RO, you gotta hook it up so that the refrigerator water gets it too.

Laura Frontiero, FNP-BC
I know, I know. So I distill my water,

Kevin Ellis
Uh-huh, that's a good one.

Laura Frontiero, FNP-BC
and use liquid CT-Minerals by CellCore. And when we travel, I even drink distilled water. It's so clean.

Kevin Ellis
That's great.

Laura Frontiero, FNP-BC
Yep.

Kevin Ellis
Good.

Laura Frontiero, FNP-BC
Okay, so we've talked a lot about causes of osteoporosis and you can learn more from Kevin at bonecoach.com 'cause there's even more. But for the sake of time and all the things we wanna cover on this talk, let's hear it about exercise. I mean, tell us the truth. Is walking enough for your bones?

Kevin Ellis
I'm gonna 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 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, have it as part of your plan, but understand that you need two different types of stimuli for your bones. You need muscle pulling on bone and you need impact. And the most effective interventions are gonna use one or both of those things in combination. So what happens is when you have muscle pulling on bone, you have this mechanical signal that's sending a chemical signal to tell those bones to become stronger, right? So that you're not having that if you're just walking. Now, weight bearing exercise, that's really important. That's any kind of exercise where your body, your bones, your muscles, they're working against gravity to keep you upright. That's placing a good stress on your bones, and you do wanna incorporate that. So that's your walking, you're jogging,

you're running, you're dancing, you're gardening, playing soccer with the kids or grandkids. You know, whatever that is, that's great.

Laura Frontiero, FNP-BC
And people always think weightbearing is lifting weights. Weight Bearing is bearing your weight on your feet.

Kevin Ellis
Exactly.

Laura Frontiero, FNP-BC
It's how you're moving around the planet. That's weightbearing.

Kevin Ellis
Exactly. 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. 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, don't count that as your only form of exercise because it's not gonna 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 wanna be providing enough intensity and stimulus that's gonna help your muscles and your bones grow and become stronger. So Dr. Belinda Beck, she ran the LIFTMOR trial in Australia, she's done a lot of great research with exercise. And they worked 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 intensity range that we wanna be doing when we're doing those types of exercises is in that five 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 gonna tell you right now, just don't go do that and try to get up to that intensity really fast. You probably want to 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 gonna do it, I'm telling you what, it's not gonna do it, right? You need a longer time period for that.

Laura Frontiero, FNP-BC
It takes time.

Kevin Ellis
So be patient with yourself and rest fully.

Laura Frontiero, FNP-BC
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, did you call it muscle pulling? Muscle pulling on bone exercises?

Kevin Ellis
Yeah, 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, as all of us are going about our daily lives, doing exercise, and moving about, all of us, this is a normal part of that bone remodeling process is 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 osteoclast, the cells that break down bone, "Hey, we've got some damaged bone. "We need to come clean this out." So what happens is it's a coupled process. Osteoclasts come in, they scoop out that damaged bone. And then what happens? We have these osteoblasts that follow and they come in and they build and lay down stronger, healthier bones. So that is normal part of remodeling. We need that. Let's go

back to 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 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 kinda closing, bringing that full circle.

Laura Frontiero, FNP-BC
Yeah. And then, one more 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.

Kevin Ellis
Absolutely. Okay, so mitochondria plays such an important role in our bone health. They're essential for maintaining those osteoblasts, those bone-building cells, the osteoclasts, your bone-breakdown cells, and the myocytes in the muscle. And when you have mitochondrial dysfunction, that's going to impair that osteogenesis, that bone-formation process, and it's gonna increase the activity level of cells that break down bone, which is gonna 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 gonna contribute to age-related stem cell dysfunction in the bone. And then, we have mitophagy, which is 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 plenty of research out there that's gonna suggest an anti-inflammatory diet with plenty of protein, exercise, supplementation, proper supplementation with things like vitamin D, omega-3 fatty acids, probiotics even. All of these things have been shown to have a positive effect on muscle strength, bone density, and bone quality.

Laura Frontiero, FNP-BC
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 bonecoach.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 you really are an expert in which supplements to take, which ones are kinda 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 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 congratulate you for how far you've dug into this. You speak just like any expert speaker I would hear at a medical conference on osteoporosis. So thank you for your contribution to this. You just shared so many pearls on this interview, so thank you for that.

Kevin Ellis
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.

Laura Frontiero, FNP-BC
Oh yeah.

Kevin Ellis
Both are 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 beyond the side of prevention, be patient with yourself, be kind to yourself along the way. And that's the most important stuff.

Laura Frontiero, FNP-BC
It is, it is. And it's never too late no matter where you're at in your bone journey. Final thought that I wanna 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 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.

Kevin Ellis
Absolutely. And I always say, regardless of whether you take the medication, you still have to do everything that we teach. Identify and 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, the body, mind, and bone, in a way that prevents fracture and injury. So you gotta 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.

Laura Frontiero, FNP-BC
Absolutely. That is a great place to end. Mike drop, Kevin. Thank you for being here.

Kevin Ellis
Thanks for having me. See you, everybody.

Laura Frontiero, FNP-BC
Take good care, bye-bye.