Dr. Jill Carnahan - **00:00**

Hey guys, Dr. Jill here. What if everything we've been taught about osteoporosis is focused on the wrong endpoint? Most of us have been taught to think about bone health in terms of one number. The DEXA scan, right? Your bone density drops and you're told you have osteoporosis or osteopenia and suddenly the entire conversation is about getting that number back up. What if what you've been taught is all wrong? You're going to hear that and more with our interview with Dr. John today. And I think you're going to want to stay tuned and maybe even share with a friend. And hi, I'm Dr. Jill and welcome to Resiliency Radio, your go to podcast for the most cutting edge insights integrative and functional medicine. I'm your host and with each episode we dive into the heart of healing and personal transformation.

Dr. Jill Carnahan - **00:40**

Join me as we dive into health and healing through world experts, innovators, leaders and people. Experts of all types. Today's no different. We're going to talk to Dr. John Newstad. I'll introduce him in just a moment. But before I do, I want to remind you, number one, if you haven't yet got my book unexpected, you can get that on Amazon or anywhere books are sold. It's a memoir, a prescriptive memoir with lots of information for practical application if you have Crohn's or colitis or cancer or any sort of gut disorder, mold related illness. And we also dive into relationships and living through our trauma and how to heal from the inside out. So if you haven't yet got a copy or if you've read it, will you share the link with a friend?

Dr. Jill Carnahan - **01:19**

If you want a signed copy, you can go to Dr. Jill health.com just put in the memo of your order who you want me to sign it to and I will personally sign it and send it out to you. Second thing, as you know, if you've been around, we have supplements@Dr.jill health.com that are specially curated just for you. We have all kinds of packets and programs that are specific for gut healing, for mast cell activation, for tick borne infections and pretty much everything in between. So please check it out. You can get 15 off your first order. Dr. Jill health.com Lots and lots of great stuff there. Okay, let's go ahead and introduce our guest. Dr. John Neustadt is a founder and president of nutritional biochemistry nbi.

Dr. Jill Carnahan - **02:01**

He earned his naturopathic medical degree from Boster University where he was awarded the Founder's Award for academic and clinical accidents excellence. Dr. Newstad has published more than 100 medical articles, written for health and wellness books and is now number one Amazon best selling author in the field of osteoporosis. His most recent book is the second edition Fracture Proof your Bones, a comprehensive guide to osteoporosis. And we're going to talk about all about bone health today. So let's get into it. Dr. Neustadt, all the way from San Diego, I am delighted to have you on the show and especially excited to talk about osteoporosis and your second edition, Fracture Proofing your Bones, which is just the best title ever. Love it. Because so many women and some men come to me and it's a little too late, right?

Dr. Jill Carnahan - **02:50**

Although I'm sure that you have a spectrum of advice and we're going to dive into that today. So guys, if you're

listening and if you have been diagnosed with osteoporosis, osteopenia, osteoporosis or someone you know, be sure and stay tuned and be sure and share this episode because I feel like this is going to be so jam packed with good information. Let's start. John, you said one of the biggest mistakes we make is equating bone density with bone strength. Let's start there. What does a DEXA scan actually tell us and what critically important information does it not tell us whether someone's going to have a fracture or not?

Dr. John Neustadt - **03:20**

That's a great question and a perfect place to start. And I want to be clear, it's not just we, you know, clinicians, it is also the general public. There is this understanding out there and this repeating of this notion that the bone density test is the only thing that needs to be tracked and that is predictive of fractures and it does have some predictive value, but it's an ability to predict fractures which are frankly the most dangerous thing with this condition. If you are a woman 65 and older, you have osteoporosis, you fracture hip, there's up to a 36% chance that you're going to die within a year and half of those who survive approximately never regain their full pre fracture level of, you know, pain free lifestyle, mobility, comfort that they had before.

Dr. John Neustadt - **04:08**

So for me, every question centers on the simple idea of how well does this test perform, predict fractures? Or if something's being recommended, how well does it reduce somebody's risk for fractures? Not simply how well does it change a number on the test. And we've known since the 1990s that a bone density Test predicts less than half of people who were fracture. And then in about 2008, another study came out that refined that knowledge a little bit more. And based on that study, we know that for women with osteoporosis, a bone density test only predicts 44% of them who will fracture. And for men, it's only 21%. Now, every organization that's looked at the data have correctly concluded that fracture risk depends on factors largely other than bone density. It's just one piece of a much larger puzzle.

Dr. John Neustadt - **05:03**

Despite that, even 20 years, you know, decades after I've started this research and this work, even still today, the clinical conversation almost always centers only around changing the number on the test instead of treating the patient in front of them and talking and understanding how we can reduce fracture risk.

Dr. Jill Carnahan - **05:27**

That makes so much sense to me. And obviously I think we should address the elephant in the room, which is DEXA scans make money. And I think there is a little bit of a motive. I don't want to always sound like a conspiracy theorist, but there's clearly, whether it's mammograms or DEXA scans, these are industries, right? Do you want to just before we dive into bone health and actually what does predict fracture risk, talk briefly about the industry and why that has been such a standard.

Dr. John Neustadt - **05:53**

That's a great question. It. It is really based on the history of the disease and how the disease was first identified and defined many years ago. So in the 1940s, there was a physician out of the University of, I believe is in Massachusetts who put X rays through the bones or the bodies of pigeons who he had removed the ovaries from. He took the ovaries out and he put X rays into their body and discovered that they had less bone. Their bone was porous. Osteoporosis literally means porous bones. And he called it at that time less bone in bone.

Dr. John Neustadt - **06:34**

And so that historical foundation followed through the diagnosis, official diagnosis by the World Health organization in the 1990s based on that bone density test, which is an X ray, and it is based on having lower T score or lower bone density in having that threshold met of -2.5 or lower based on that X ray test. The challenge is that bone is not just minerals. And the X ray only detects the amount of minerals in bone. Bone is a tissue, a complex tissue. And there are in fact, for example, 180 to 200 different proteins in bone. And it's the bone collagen, that structural component of bone, that protein that gives Bone, its ultimate strength and its ability to withstand a fracture.

Dr. John Neustadt - **07:28**

In fact, if you were to take a chicken bone and soak it in vinegar and change out the vinegar after a few days, all the minerals would be removed and you're left with that collagen and extracellular matrix, those proteins. It's indestructible. It's like a rubber chicken. Wow. Now, when you get then into the idea of medical testing, I have a hard time separating that from the financial incentives within the medical industry. And let's, you know, frankly, it's an industry like anything. And there are both financial and legal incentives that continue to push people, push doctors and people into this very narrow definition of a bone density test being the thing to track and being what is reimbursed for. And that's an important piece of this puzzle because it's the official diagnosis and it still is the gold standard. Physicians and healthcare providers income.

Dr. John Neustadt - **08:25**

If they're going to get reimbursed for that test, it has to be that test. And that can dictate if they're taking insurance, what they recommend to the patient and what they don't recommend to the patient. But also it goes deeper than that because it has to do with medical education. And research has shown, there have been multiple studies that have done that doctors are confused about this situation, about osteoporosis and bone loss. They're, they're not sure how to interpret the test like a T score versus a Z score. In fact, if you ask most doctors and say, you know, what would a T score tell you for a woman who's, you know, 40 years old and still menstruating.

Dr. Jill Carnahan - **09:05**

Yeah.

Dr. John Neustadt - **09:06**

The reality is it can't tell you anything because there's no reference range that young. And a lot of doctors don't know that it's not applicable to the younger population. Or once they get the result, they're not sure how to interpret it. They're not sure if they're going to recommend a medication, what the best medication is and why. They're not educated in having some of these more nuanced, longer conversations around diet, lifestyle, exercise, supplementation that have been shown to help promote and improve bone health and reduce fracture risk. And so for all of those reasons, and they don't have that long of a, you know, seven, 10 minute appointment, you just can't manage all that information. Especially when somebody's coming into an appointment with things that are perceived to be more immediately risky, like heart disease or diabetes.

Dr. John Neustadt - **09:58**

There's only just so much they can deal with or they're equipped to deal with.

Dr. Jill Carnahan - **10:02**

I love that you say that. And I can say as a medical doctor, M.D. Trained in our system, we are given very little information. And like you, I've gone outside of that after my training to go deeper. But even now I feel like this is an area I always get excited, like for example today to have you as a guest because this is an area where patients have so many questions and providers who. We have a lot of listeners who are other doctors. So let's define the real basics and then I want to talk about what bone actually is made of. But before we do T and Z, do you want to define basic to like a 8th grade level or 5th grade level? What does that actually mean?

Dr. John Neustadt - **10:39**

A T score compares a patient's bone density to somebody in their twenties of the same gender and sex. So if it's a woman who's 68 years old, it would be comparing her bone density to a woman in their 20s and the end of the same race. A Z score compares somebody's bone density to somebody of their same age bracket in the same gender, in the same race. So a Z score is more an apples to apples comparison. A T score is comparing the person to a younger population.

Dr. Jill Carnahan - **11:17**

Got it. And in that realm, what I've always thought about is if the T score is low and it's a 60 year old woman who's

perimenopausal, by that time, she be postmenopausal. It doesn't tell you a lot because you're comparing to a 20 year old. This might actually be the norm for that age and sex, correct?

Dr. John Neustadt - **11:33**

Well, that's an interesting question. So these are standardized results. So across the board they're going to be standardized to that younger population. So it does, it tells you whether you've lost peak bone mass. So peak bone density occurs in our twenties for both men and women. So it just tells you have you lost bone density since. Since then and is it low enough to meet that threshold definition of osteopenia, which is a T score of minus 1 to minus 2.5, or osteoporosis, which is minus 2.5 or lower, minus 2.7, 2.8, et cetera.

Dr. Jill Carnahan - **12:06**

Okay,.

Dr. John Neustadt - **12:07**

That.

Dr. Jill Carnahan - **12:07**

Makes.

Dr. John Neustadt - **12:07**

Sense. Yeah. And what that telling us is there. There is a scale at which as you're losing more bone, it does correspond and is associated with fracture risk. But interestingly, as I've already mentioned, it's not the whole story. It doesn't even predict half of People who will fracture. Nor does it give you an idea of necessarily what to do about it. Because even if were to prescribe medications, the ability of a medication to reduce fractures in osteoporosis is quite weak. In fact, there's only one medication, that one bisphosphonate for sort of first line therapy that will reduce both vertebral and hip fractures if you've never had one before. In fact, the ability of a bone density test, the improvement of bone density created by a drug it only can accounts for about 20% of the reduction in fractures.

Dr. Jill Carnahan - **13:13**

That's dismal, isn't it? And no surprise. And this makes sense to me clinically because what I'm seeing in clinical practice is women who do have this. The types of improvement I see. And again, I'll let you talk as an expert on all these things. But exercise, hormone replacement, the other things are what make a much bigger difference in my experience. One more question. And again, this may be a silly question, you can set it straight. But my thought is, as you're talking, if we could do a baseline for us at 35 or which again, those numbers don't apply like you said. But if we compared us to us. So me at 35 versus me at 45 versus me at 55, would that make more sense if it was an N of one comparison versus the population?

Dr. John Neustadt - **13:56**

That's an excellent question. There is a result on the dexis test that can be helpful and that's the Z score. Are you losing bone density compared to somebody of your own age? Except, you know, and that is approved for use in younger populations to determine if there's bone loss. And it's used and supposed to be used to determine if it's a secondary cause of bone loss. So even in perimental and postmenopausal women with bone loss, it is, you know, when it's often assumed that, well, it's just caused by the drop in estrogen that accompanies menopause and through in menopause and for the 10 years after is the fastest rate of bone loss. But even in those cases, up to 30% of cases are caused by things other than just the drop in the estrogen and drop in the hormones.

Dr. John Neustadt - **14:49**

And so it's really important to investigate secondary causes because they're very common.

Dr. Jill Carnahan - **14:54**

Hey guys, just a moment to interrupt the show to remind you that we are accepting new patients at Flatiron Functional Medicine in Louisville, Colorado, my clinic. Give us a call if you're interested in finding a functional medicine expert, someone with hormone advice, or if you have bone issues, you can count on us to help you. You can call 303-993-7910 or email info@iron functional medicine.com to get scheduled or take a look at jillcarnahan.com to look at all of our providers. Okay, let's get back to the show. Okay, let's dive in there, because that's what I've seen. I'm. I do complex chronic disease, and I've seen cases of young women on too many steroids for too long that have pretty severe issues with their bones. And I've seen young women that go through premature menopause or surgical oohrectomy that have issues.

Dr. Jill Carnahan - **15:40**

I've seen women who lack certain hormones early on. I've seen women who just don't do any sort of strength or weight bearing. What would you say are the top five causes, or maybe 10? You can give us as many as you like of loss of bone. And let's just talk about women for the moment.

Dr. John Neustadt - **15:57**

Yeah. For me, the number one blind spot in conventional medicine and in patients for bone destruction and what's causing it are medications.

Dr. Jill Carnahan - **16:08**

Yes,.

Dr. John Neustadt - **16:08**

There is a long list of medications and drugs that are destroying bones. And in fact, most physicians aren't even aware that the medications they're prescribing, the most commonly prescribed medications, are destroying bone and increasing fall and fracture risk. There's a study that was done a few years ago. They looked at the medications that women were on. Women with osteoporosis were on in the three months before they fractured and ended up in the hospital and what they exited the hospital with. And 76% of them were on a drug that increased their decreased their bone density, increased their fracture risk or increased their fall risk. And when they left, even when some of the medications were changed, they were just switched to other drugs that did the same thing. And so there was no net benefit. It's a real blind spot.

Dr. John Neustadt - **16:55**

Conventionally, doctors don't realize that they're the ones who are creating for, you know, they're contributing in a large part to this epidemic the most, again, the most commonly prescribed medications. And what are those you already mentioned? Prednisone. About 1% of the population is on chronic glucocorticoid or prednisone. In the postmenopausal sort of segment of that population, it goes up to about 5%. And those already are the people who are at most at risk for bone loss and fractures and people who are on chronic glucocorticoids 30 to 50% of them are going to fracture. And one of the challenges with that is the risk of fractures increases before it even starts to show up on a bone density test, because it does more than just destroy bone, it also destroys muscle fibers and reduces balance and increases risk. Antidepressants.

Dr. John Neustadt - **17:50**

The biggest, most popular category of antidepressants are those that artificially elevate serotonin. SSRI, SNRIs. There are serotonin receptors on bone. There are two primary metabolically active cells in bone. The osteoblasts build up new, healthy bone, and the osteoclasts break down old, worn out bone in a process called bone remodeling, which we need. We need that for healthy, strong bones. There are serotonin receptors on osteoclasts. And when we give these medications that artificially increase serotonin and it binds to the osteoclast, it increases the activity of the osteoclasts and how long they live. So you're getting more bone destruction, and the osteoblasts cannot keep up with that. Essentially, it's a system that's out of balance.

Dr. John Neustadt - **18:37**

And now we know that for every one to five years of taking these drugs, a woman taking it for one to five years, for every 19 women, we now expect one of them to fracture.

Dr. Jill Carnahan - **18:48**

Wow.

Dr. John Neustadt - **18:49**

And then their proton pump inhibitors, acid blocking medications, definitely destroy bone through different mechanisms. Through a gut bone connection, through inducing nutritional deficiencies, through chronic inflammation that can develop and dysbiosis that can develop. There's all of these drugs are harming bone through different mechanisms. And that's a short list. There are many more.

Dr. Jill Carnahan - **19:11**

Wow, that makes sense. And again, you name two that are really common. I'm sure people out there listening, many of them are one of those drugs. Super common. What are some other common causes that women might not be thinking about? I'm thinking about the gut and absorption of minerals and stomach acid. And obviously we talked about hormones and thyroid. And do you want to give just a smattering of some of the top other root causes of bone loss besides medications?

Dr. John Neustadt - **19:37**

Absolutely. And this is a really important, I think, idea that you're raising in terms of thinking more holistically of what's going on. There is a gut bone connection, as I just mentioned, with the acid blocking medication connection. So what happens when you decrease acid production? And that can occur not just with these medications, but as people get older, there tends to be a trend. More and more people have decreased acid Production Anyway, if there's an autoimmune disease, that also increases the risk for decreased acid production. Well, acid is, helps activate digestive enzymes. As you know, it also is involved in sterilizing our food. And so when you're blocking that part of the digestive system with the medication or just somebody has lower acid production naturally, then what can happen is the food is not getting totally digested.

Dr. John Neustadt - **20:28**

And you can get larger food particles going down into the intestines that can activate the immune system in the intestines. And similarly, if you've got unsterilized food or only partialized sterilized foods, you can get, you know, bad, you know, critters going down there, bacteria, protozoa, viruses. And that can create an infection. And it sets up a situation both for decreased absorption of nutrients and also chronic inflammation. And the chronic inflammation, those inflammatory molecules get into the systemic circulation from the gut. They directly can go to bone in the bloodstream and they activate osteoclasts as well, those interleukins that are pro inflammatory, they activate the osteoclast. So you get faster bone destruction. And then you combine that with these nutritional deficiencies that can develop. As I mentioned, you know, bone is highly protein dependent. There are 180 to 200 proteins in bone.

Dr. John Neustadt - **21:24**

So not getting enough amino acids, the raw materials or vitamins and minerals that the bone requires to be healthy just sets up that situation for more bone destruction. And this is all well documented in the research. And this gut bone connection.

Dr. Jill Carnahan - **21:40**

Okay, this makes so much sense. I'm going to use myself as a guinea pig here and ask you what you would do with me. 25 Years old, I had cancer chemotherapy. Shortly after I developed celiac and Crohn's disease malabsorption syndromes. Right from early on. I didn't know this till later, but I was severely hypochlorhydric, deficient in zinc and low stomach acid. And then of course the stress of mold and inflammation and all that later in my 30s. So if you can imagine, oh, and premature menopause because of the chemotherapy for in my late 30s, early 40s. So all of that, you've just got, you've got at least five risk factors for osteoporosis. Right now I'm on probably for the last 15 to 20 years. Hydroxyapatite, calcium, magnesium, D3, K2. I also have a VDR receptor, which means I'm very low on D naturally.

Dr. Jill Carnahan - **22:28**

So I take loads of D3 and I do strength training, I do weight Bearing activity. What am I missing? What else would you say? Give me, give me a run, because I feel like I've got about six of those things that we just talked about that are risk factors. I am now, I just turned 50. I actually do have strong bones and I think it's partially from what I've done. But take me as a guinea pig and let's talk to the people out there who might have some of these common things that we talked about. What would you do with them?

Dr. John Neustadt - **22:54**

I think first and foremost, it's important to work with a clinician like yourself who can understand and approach this from a holistic perspective. Correcting the gut, dealing with those gut issues is crucially important. I mean, that to me is non negotiable. Health starts and ends in the gut. So dealing with that is really important. And I'm going to assume that you've got all that, you know.

Dr. Jill Carnahan - **23:16**

Yes. In fact, I consider myself cured from Crohn's, which in conventional medicine is not a real thing. Right. But I have zero signs or evidence of Crohn's disease.

Dr. John Neustadt - **23:25**

Amazing. Amazing. So, you know, the one thing then that I would talk about, I want to put the hormones into a larger perspective and I'd love touch on that because oftentimes people only think about estrogen, estradiol or progesterone, you know, the hormones that start to decline around menopause and for the years after. But the bones interact with many different hormones in the body. I mentioned serotonin as one of them, but melatonin, there are melatonin receptors in bone. So I would work, if working with you, I would ask you about your sleep and see if you are on any medications that no, we know, deplete melatonin. There's a long list of, you know, drug nutrient depletion. So that's another thing to be cognizant of. Beta blockers, for example, reduce melatonin.

Dr. John Neustadt - **24:18**

But I would ask about your sleep and what we know is that getting an average of about seven hours of sleep per night is associated with healthier bones and lower risk of osteoporosis. And in fact, a study that came out of the uk, it was a UK Biobank study and they've got amazing data there because they have a centralized healthcare system so they can collect data from patients. They found that of all the fractures in the elderly, 17% of them were due specifically and directly to sleep issues.

Dr. Jill Carnahan - **24:48**

Wow.

Dr. John Neustadt - **24:48**

And the problem is also as people get older, 65 and older, about over 90% of those patients are on a medication that increase their risk of Falls. And 95% of calls falls occur because somebody fractures. So I would ask you about the other. If you're on any medications and do those increase your fall risk or damage your. Your bone, directly or indirectly? I would. I would ask about your social support and how involved are you and how fulfilled you are. Because what a lot of people don't think about in terms of their social support and social structure is the hormone oxytocin.

Dr. Jill Carnahan - **25:23**

Yes.

Dr. John Neustadt - **25:23**

Oxytocin is that hormone of support and bonding and love. It helps people feel more connected to other people. There are oxytocin receptors on osteoblasts. In fact, osteoblasts produce their own oxytocin, and it helps stimulate osteoblast activity to create new bones. What we do know, in terms of what the research has shown, and there's a whole chapter on my book about social support, is that people that have strong social support and it doesn't have to be a. You don't have to be the life of the party and, you know, 7, 10, always, you know, friends and always going out, they found that it ma. It maxed out at about three people. If you have a couple of good friends that you talk to and interact with and do things with, that is associated with lower osteoporosis risk.

Dr. John Neustadt - **26:12**

But also if somebody does fracture, it is associated with faster and better healing time. So they heal faster, and that's the oxytocin component. In fact, studies have shown that women with osteoporosis have lower oxytocin. And so there's. There's that social component of it. And then there's thyroid. People know, and I think conventionally, doctors understand hyperthyroid, or having excessive thyroid hormone destroys bone. That is often caused by people being over medicated. It's what I've seen. But also subclinical hypothyroidism, where, you know, that is associated with bone loss and osteoporosis. And so when you're looking at, and I'm going touch on just a little bit with men, we haven't touched much on them, but male osteoporosis, that can be caused by low testosterone. And in men with osteoporosis, though, up to 50% of those are caused by things other than just the drop in testosterone.

Dr. John Neustadt - **27:09**

But the myth that I see with men often clinically, is they may get the testosterone tested, but they're not getting their estradiol tested.

Dr. Jill Carnahan - **27:16**

Yeah.

Dr. John Neustadt - **27:17**

And it's the estradiol in both men and women that is directly responsible for maintaining bone health and improving bone density and bone strength.

Dr. Jill Carnahan - **27:27**

Wow. Okay. That was a beautiful list. And probably those are my saving grace because I'm a great sleeper and have an incredible social network. So those are probably the things that I do have going for me. Let's talk a little bit about D3K2, which form. I want to hear what you have to say about that. And types of calcium. Do they really work? Give us the. Because those are the things people think about, right? Like I take my calcium and I. I think there's a lot of myths out there about the type of calcium, the amount of calcium, what else you need around it. So let's talk a little bit about that briefly so that people can get clear about the right kinds of nutrients.

Dr. John Neustadt - **28:00**

I want to just reiterate how I view the research, because I view the research through a very narrow lens. I'm looking for clinical trials and studies that showed that an isolated nutrient has been shown to stabilize or promote healthy bone density, improve bone density in clinical trials, but more importantly to maintain bone strength. Now, in studies, the most direct indicator of strong bones is if somebody fractures. So I want to see, as a primary endpoint in the studies, fractures, and we look at calcium. There is no indication that one form of calcium is superior to other. Any other form with respect to bone strength that is reducing fractures. There are reasons why someone might want a certain form of calcium over another calcium carbonate, which is the most studied form.

Dr. John Neustadt - **28:53**

And that has been shown in studies to reduce fractures by about 18 to 23% when enough vitamin D is present. So you can't just have the calcium alone. You need the vitamin D in. In tandem with it. And so the calcium carbonate can be pretty hard on the system and cause constipation and cramping. Calcium citrate is frankly the form that I prefer because it is safe in people who have kidney stones. The most common kidney stones, like oxalate kidney stones. As people get older, if their. If their stomach acid decreases, it is still absorbed. It doesn't require an acidic environment to absorb the calcium, and it is more absorbable than calcium carbonate. Now, hydroxyapatite, calcium, other forms of calcium, look, those are all fine. There's no indication in terms of bone strength that one is better than the other.

Dr. John Neustadt - **29:47**

But I just prefer the calcium citrate for those reasons. Vitamin D. I'm a big fan of testing vitamin D. Now, first of all, calcium, ideally people are getting them from diet like first and foremost, ideally, it's coming from diet, and they don't need to supplement with calcium.

Dr. Jill Carnahan - **30:03**

But.

Dr. John Neustadt - **30:03**

The average American woman only consumes about 800 milligrams of calcium in her diet, and the average American man, about a thousand. So the US RDA for women is 1200 milligrams per day. So maybe getting 400 milligrams is great for a lot of women of calcium, extra calcium in a supplement. But this blanket recommendation that we see, I've seen for so many years, of every woman should take 1000 milligrams, 1500 milligrams of calcium, I think is not only irresponsible, it doesn't treat the person like an individual. It also runs the risk of toxicity and getting to that tolerable upper limit of 2,000 to 2,500 milligrams a day, which we want to avoid with vitamin D. In terms of falls and fractures.

Dr. John Neustadt - **30:46**

A vitamin D level of 30 to 44 nanograms per milliliter is associated with maximum fall reduction and maximum hip fracture reduction, which is frankly lower than what many people, myself included, like, for immune support, you know, typically people like 60, 70, 80 on a blood test.

Dr. Jill Carnahan - **31:03**

Yeah.

Dr. John Neustadt - **31:03**

To get to that 30 to 44 nanograms per milliliter range, studies have shown that taking about, you know, 2,000, 1,000 to 2,000 IUs of vitamin D3 per day, you know, is sufficient to get many people or most people into that range. Obviously, if you have, you know, Crohn's disease or other malabsorption issues or vdr, there are reasons why to take more. Or if you just want to get your blood level higher when we're talking about vitamin K. To me, this is a cautionary tale because there are a lot of marketing claims about vitamin K. And for full disclosure, you know, I have a dietary supplement. I have a bone support products I formulated with vitamin K. But there are different forms of vitamin K and there are different molecules. Right. You change one carbon atom on a molecule.

Dr. John Neustadt - **31:50**

While they can have overlapping benefits in the body, they also have very different effects. And vitamin K is a great example of that. So the two forms of vitamin K2 that are commonly used in both in dietary supplements are MK4 and MK7. So if we ask the question, have these nutrients been shown in clinical trials to improve bone density? Well, MK7 has never been shown to improve bone density in any clinical trial. If you go on PubMed, you search for it, what you'll see in about five to seven prospective clinical trials with MK7 in all doses at best. It only slows down how fast somebody loses bone density. It's never been shown to stop bone loss or reverse bone loss. And there are no fracture data on it. Zero.

Dr. Jill Carnahan - **32:36**

Wow.

Dr. John Neustadt - **32:37**

When you look at MK4 in the dose of 45 milligrams per day in divided doses, there are over 25 clinical trials on it. It's been shown repeatedly in postmenopausal women with osteoporosis to promote healthy bone density. In these clinical trials, the bone density improved and in fact it's been approved since 1990s by the Ministry of Health in Japan for bone health. That's how well it's been studied.

Dr. Jill Carnahan - **33:01**

Wow.

Dr. John Neustadt - **33:02**

But more importantly, what has been shown is that it maintains bone strength. That in these clinical trials they were. All the fracture outcomes data were in postmenopausal women with osteoporosis. It showed that there was 70% stronger bones, up to 70% or more stronger bones in the women who took the MK4 compared to those who did not. And the outcome that they were looking at was fractures. And what that tells me is that it's important to really ask the right question because there are a lot of marketing, you know, claims that are being made by dietary supplement companies out there. But if you ask them to show you data about bone strength and what was looked at and how it was studied, that's when I think people really get the more clinically relevant information.

Dr. Jill Carnahan - **33:55**

That was a great overview. I really appreciate that because I couldn't agree more. The way supplements are marketed is so deceptive sometimes and it really doesn't get based all the time on the real evidence out there. Let's shift a little bit. I think we should stop talking about bone. Not that you do, but many people out there do bone health in isolation from the muscle unit. Right. Because we know strength and all this is so powerful for improving

bone health. If you could prescribe exercise like medicine to a 55 to 65 year old woman with osteopenia or osteoporosis, would you give them for their routine?

Dr. John Neustadt - **34:28**

That's a great question. I'd like to meet people where they're at. And I can't answer this question in isolation without also addressing diet and the nutritional component. Because we want to build muscle and we want to build strength and stability, reduce that risk for falling. In order to do that though, you need two things. You need the raw materials from food, protein, for example, and you need movement and the right exercise in terms of how much protein Somebody should get, I like to recommend, based on the research, somebody takes their weight, body weight in pounds, multiply it by 0.6, that's the minimum number of grams of protein somebody should be consuming per day. Then you want to do exercises to improve strength and stability. I like to think of myself as a realist.

Dr. John Neustadt - **35:14**

If somebody's been a couch potato for 20 years, they don't want to go into the gym, they have no desire to lift weights. I don't want to prescribe that to them because this is something we want to develop healthy habits that are going to be moving people in the right direction. And what that means is doing things that you're able to sustain over months and years. And don't get me wrong, you don't have to do the same thing if people are bored. There are lots of options for changing. There's great research out there for weight bearing exercise. I think that's commonly understood studies showing that improves bone density, that it reduces fall and fracture risk. But safety is first and foremost, really important.

Dr. John Neustadt - **35:52**

Making sure that you're only lifting weights, that you can do safely and your form is good, and working with somebody who can help you do it safely and progress in a safe manner. But if somebody's not interested in doing that, I mean, there are other things that have been associated with reduction, you know, improvement in bone density and reduction in fall risk, like tai chi and qigong and yoga, you know, things of that nature. Even just walking 7,000 to 7,500 steps per day, not the 10,000 steps per day that I hear all the time, but 7,000 steps per day on average is associated with a 50 to 70% reduction in all cause mortality. That's death from everything, including dying from a hip fracture. Now it doesn't have to be though, that people set aside this big chunk of time every day to exercise.

Dr. John Neustadt - **36:42**

Exercise can just become part of our life. Movement, and I hope this is the case for people, becomes part of our life. Even while you're brushing your teeth, people can take that opportunity to stand one leg, called the stork exercise, while you're brushing the bottom teeth, that's a minute switch to the other leg for the top teeth, that's another minute. So two minutes a day of standing on, on the opposite leg or one leg twice a day because hopefully

people are brushing their teeth morning and night can be very helpful for developing a little bit of core strength, a little bit of adductor strength, better balance. And in fact, the research is clear that people who are able to stand one leg for 10 seconds. This study was done.

Dr. John Neustadt - **37:26**

People in their 70s had an 84% lower risk of all cause mortality compared to people who could not stand one leg for 10 seconds. And even just standing on a leg for five seconds. Being able to stand one leg for five seconds compared to people who can't stand is associated with over 200% reduced risk for falls and fall related injuries and also reduce risk for loss of independence. Meaning people can still dress themselves and take medication independently and do things like that. Walking, parking a few rows away from the door, further away from the door to market and walking further, taking the stairs. All these things are cumulative and add up.

Dr. Jill Carnahan - **38:10**

What great practical advice. I have always been one to say I love to sneak these exercise snacks in my day. Like when I'm making coffee, I might do squats in my office. In my home, I have a pull up bar. So if I go through that door I do a pull up or two. Like I just think there's ways that people can make this like part of their routine and they almost don't realize they're getting in those things. So I love that you had the same idea. I want to talk about kind of an elephant in the room that's way out in there, the public. But I want to know your, as a bone expert, your thought on GLP1s. What are we doing right? What are we doing wrong? I prescribe them. I think microdosing is incredibly effective for a lot of women.

Dr. Jill Carnahan - **38:42**

But if you're not being aware of what they do to the system, tell us what the risk is for the bone and if what the real risk is. Right?

Dr. John Neustadt - **38:51**

Yeah, great question. And by the way, I love your approach to exercise and these exercise snacks, I love that I may use that with your permission. That's a phenomenal phrase. But the GLP1s is an interesting space. I mean these are not brand new drugs. They've been around for a while.

Dr. Jill Carnahan - **39:07**

Right.

Dr. John Neustadt - **39:08**

And when I was in clinical practice and prescribing, I didn't want to prescribe drugs unless they'd been on the market for at least five years because we don't really know. Over half of the side effects are not known until drug's been on the market for many years. The GLP1 is the actual mechanism of action. There's no indication that the drug directly affects bone. In terms of harming bone, my concern is with the restriction in calories and the loss of of weight, the impact on bone. Now it is well documented that when people are overweight and they restrict calories or they go on a diet and they lose weight, bone density can go down. That's not new. This is independent of taking a GLP one even without that. So that's not a new phenomenon.

Dr. John Neustadt - **40:00**

But what we do see when people then get to their maintenance weight, again without the GLP1s, what we see is the bone density stabilizers are, you know, comes back up and they doesn't really seem to have any long term impact. We don't know yet with the GLP1s because the studies just haven't been done and because the GLP1s are so effective at just reducing appetite and reducing those cravings, in fact, making food not even look attractive, that there may be a concern of even greater nutritional deficiencies depending on how long people are on them than when we would normally see in somebody who's just on a different type of weight loss or weight maintenance program. So I think, you know, that's a space that I'm watching. We just don't have the data yet.

Dr. Jill Carnahan - **40:53**

Okay, I really like that answer because I agree with you. In and of themselves, they aren't directly acting on the bone, but there's a lot of things around it. I always tell patients as we do it, even if we're microdosing, you must eat enough protein, you must get exercise, and you must choose healthy foods because you're going to want to consume less quantity. And so you have to make sure the nutrients are still there. So I think we really align with that. But in and of themselves, I mostly see people gain muscle, get like they do better as long as they're doing all the right things as they're taking. And usually I'm giving very small doses too. So. Okay, so one last thing, John. Imagine a woman listening today has just been told she has osteopenia or osteoporosis, and she's frightened.

Dr. Jill Carnahan - **41:33**

If she remembers just one thing from this interview, one thing from the entire conversation, what would you have her to take away from this interview?

Dr. John Neustadt - **41:40**

I love this question because I see this dynamic so often and this is what I do with patients. People come to me with that anxiety and I understand it, getting that diagnosis, it is scary. The first thing I do is I have them take a couple of breaths, a couple of deep breaths. Then I educate them. I explain to them the limitations of the bone density test, how it only predicts 44% of women and only 21% of men who will fracture, how fracture risk depends

on largely factors other than bone density. And I then I tell them that, yes, this is important. This is a really important issue now that you're aware of it, that we start doing something about. But it's not an emergency.

Dr. John Neustadt - **42:24**

There is time to educate yourself and to put together a holistic bone health program that makes sense for you. That may include the medication, but it may not. It may not include the medication. And that's exactly why I wrote my book, fracture proof your bones to help people understand what questions to ask their doctors, to make sure they're getting the best information and recommendations and how to create these holistic bone health programs that can be tracked, that can be followed, and that can make sense for their goals and their lifestyles.

Dr. Jill Carnahan - **42:57**

Brilliant. So if I hear you correctly, the goal isn't to treat the DEXA scan. If the goal is to build a human who is harder to fracture.

Dr. John Neustadt - **43:05**

Love. Yes.

Dr. Jill Carnahan - **43:07**

Yeah. So if people want to know more about your work, your website, your book, give us the information. And if you're driving, don't worry about taking notes. We'll have this all in the show. Notes. But, but Dr. John, go ahead and give us where people can find more about you.

Dr. John Neustadt - **43:19**

The best way to find information and all of my resources are on my website@nbi health.com n bi health.com.

Dr. Jill Carnahan - **43:29**

Awesome. Well, what a beautiful adventure we've had today and what a great amount of good information you've brought to us. I'm really grateful because I feel like as we started, this is one of those topics that both physicians and patients are often confused and you've just brought some really clear, active based points that we can take

and put into practice. So thank you again.

Dr. John Neustadt - **43:50**

Thank you. It was fun. I enjoyed it.

Dr. Jill Carnahan - **43:51**

Hey guys, hope you enjoyed that great episode with Dr. Neustadt on osteoporosis and how to fracture proof your bones. What a tongue twister. Great information. Really practical and actionable items. If you know someone with osteoporosis or osteopenia that's living in fear, will you please share this with them? I feel like we got lots of great information. If you have any questions or comments, please leave them below. If you haven't yet liked or subscribed here on YouTube, we've hit over a million subscribers, so thank you. For all of you who have already subscribed, please hit that button to subscribe and the bell to be notified of future episodes. If you guys are listening on Spotify, itunes or wherever you listen to audio podcast, it would be super helpful to leave a review.

Dr. Jill Carnahan - **44:34**

So please stop by anytime you have a moment and leave us a review. And as you know, we have new episodes out every single week. So you again next week for a new episode of Resiliency Radio. Until then, be well.