THE IMPORTANCE OF BONE MARKERS

KEITH MC CORMICK, DC AND
IRMA JENNINGS, INHC - HOLISTIC BONE COACH

PDF TRANSCRIPT

Food For Healthy Bones®

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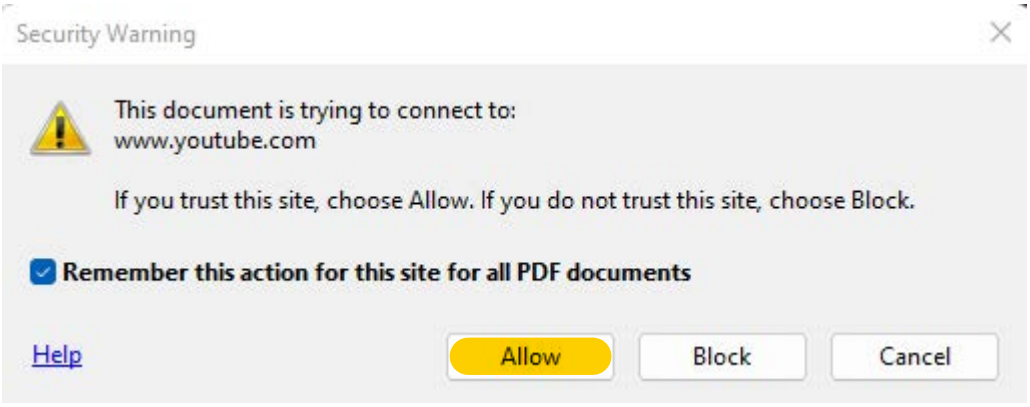

Summary

"Therapeutic targets provide medical information a doctor can use to monitor physiological improvements on repeat testing. These can enhance an assessment of bone loss and are key to managing therapy. Just as you would practice hitting the bull's-eye to improve your skills as a competitive marksman, we can refine treatment by targeting abnormal physical signs, symptoms, and laboratory tests results and then applying therapy to rectify those abnormal findings."

R. Keith McComick, DC from his upcoming book: *Taking Charge of Your Osteoporosis - The Complete Whole-Body Guide to Better Bones*

Dr. McCormick Bone Marker Ranges

- C-Telopeptide of Type-1 Collagen (CTx) 100 - 375 pg/mL
- Vitamin D 30 - 50 ng/mL
- Ionized calcium 48 - 56 mg/dL
- 24-hour urine calcium
    - women less than 200 mg/24 hours
    - men less than 250 mg/24 hours
- TSH 0.5 - 4.5 mU/L
- hsCRP less than 1 mg/L
- Homocysteine less than 8 µmol/L
- Total serum calcium 8.9 - 10.0 mg/dL
- Bone Specific Alkaline Phosphatase (BSAP)
    - postmenopausal women - less than 22 µg/L
    - men less than 20 µg/L
- Osteocalcin 8-32 ng/mL
- P1NP 30 - 50 µg/L

THE IMPORTANCE OF BONE MARKERS WITH DR. MCCORMICK

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THE IMPORTANCE OF BONE MARKERS WITH DR. MCCORMICK

THE IMPORTANCE OF BONE MARKERS.

KEITH MC CORMICK, DC AND IRMA JENNINGS, INHC - HOLISTIC BONE COACH

Introduction

I'm Irma Jennings from Food for Healthy Bones.

I'm pleased to be joined again by Dr. McCormick, a colleague of mine and one of my referring doctors. We met in 2018, when a Bones Tribe member, brought Dr. McCormick's Whole Body Approach to Osteoporosis book to my attention.

I'm the founder of the Bones Tribe Monthly Membership, which is part of Food for Healthy Bones. Offerings in my Bones Tribe begin with food for healthy bones, protein focus, calcium-rich foods, bone markers, why "we test and don't guess", expert guests who address issues that impact bones (environmental issues, healing herbs, kyphosis), case studies and all things Bones. Weekly bone-loving recipes with nutrient content are offered for your cooking pleasure.

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Introduction continued..

For my VIP Concierge clients, I offer personalized guidance.

Such as: finding DXA/ TBS facilities, support in getting blood work and bone markers, detailed spreadsheets to present to your bone doctor. Personalized food plans. Locating specific functional doctors in your area for such things as gut health repair and bio-identical hormones practitioners if that is appropriate.

Your personalized Bone Binder accompanies this program with your blood work, bone markers, calcium-in-food charts, food sources, and DXS/TBS reports. Everything at a glance for you to successfully proceed in your complete bone care.

Email: irma@food4healthybones for more information.

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Irma Jennings' Story:

I began my journey with an osteopenia diagnosis in my fifties, and I was told, "You're going to go downhill fast, and you better take Fosamax," I declined. I'm in my 70s and my bones are still osteopenic, in my spine and my hips.

Dr. McCormick's Story:

Irma:

Dr. McCormick, do you want to tell a little bit about yourself and your history? I know there's so much to say.

Dr. M:

I found out I had osteoporosis at age 45, I had a lot of hip problems with that. The first bone density I had was -4.3 spine, and then it got a bit worse at -4.5. My hips weren't as bad there,

I can't remember maybe -2.7, -2.8, or something like that. Like you, they wanted to put me on different things. And I said, no. But then I just started to fracture a lot.

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Dr. McCormick's Story continued...

And so I did go on Forteo, and then a short course of Fosamax, and that kind of pulled me out of the hole. That was 20-something years ago. I'm just staying right where I was after I got out of the hole. I haven't lost since then.

For 20 years I haven't lost anything and I'm not on any drugs. But like you, Irma, I think what's really important about your story is, that you were told you were going to get worse, and didn't. I did get worse.

You were able to stop your loss - I wasn't at the beginning. But then, I was at a much worse point by then. I was fracturing a lot. I had to, I didn't have a choice. But then, you get pulled out of the hole, and then you stay there. And that's what's the magic about doing what you do and helping people to get out of the hole.

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Dr. McCormick's Story continuation...

But, I think what people don't realize - because their doctors, their medical doctors say, "Yeah, you gotta be on these drugs forever." - and that's not true. You know, the drugs are necessary sometimes, they're not necessary other times. But usually, if you have really bad bone density like mine, you can take them short-term, and then stay out of the hole without the drugs.

So, that's the important thing about that story.

Irma:

That's an important piece because it feels like a long-term investment in the pharmaceutical industry when you start on the bone medication, and it's not necessarily true.

And that's what opened up the conversation to bone markers.

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BONE MARKERS:

- ☑ What are they?
- ☑ Who needs Them?
- ☑ How do we get them?
- ☑ How do we deal with doctor's resistance?

This clickable transcript details SPECIFIC bone markers. Click on a topic of interest (in bold) in the table of contents and you're brought to that topic.

For a copy of the printable Bone Marker Hand out click the link below: https://irmajennings.activehosted.com/series/788

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Dr. Mccormick's Fractures

Irma:

But, before we get there, how many fractures did you have?

Dr M:

Well, I had, I think just 12 or 15 in those five years after I found out I had osteoporosis, but over my life, I've had 22.

Irma:

Did you find your root cause for severe osteopososis?

Dr M:

No, I mean, I think, like everybody, it's not one thing. I'm gluten sensitive, I'm not celiac growing up, and I sure didn't eat as well as everybody else. I have no idea what my bone density was when I was 15, 20, 25, 30, and 40 - I'd have no idea. So, it wasn't probably just the gluten. I train hard as you know, I do a lot of sports and I train really hard. That increases pro-inflammatory cytokines. But it's a combination of things.

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Dr. Mccormick's Fractures continuation...

Dr M:

So yeah, it's not just the gluten for me, it was over-training and probably not eating well. So.

Irma:

So that gets into that whole thing about, "Well, if I'll just do my vibration plate," or "I'll just do yoga," or "I'll just do this..." And it's a whole picture, it's the whole body and the approach has to be through a whole mindset.

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Bone Resorption Markers - Lab Markers

Dr M:

That's where these bone resorption markers help. And all lab markers help because it isn't just one thing. You have to not just do one thing to fix it, and you have to do not just one thing to figure out what to do to fix it.

Irma:

Right. The resistance that so many of my clients have, and perhaps your patients have,
is that the doctors don't want to order the bone markers.

Why do you think that is? The pushback that I get is that they're unreliable, that they're unpredictable and...

Bone Resorption Markers - Lab Markers continued...

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Bone Resorption Markers - Lab Markers continued...

Dr M:

And I can totally agree with that, and I think that is such an important thing to talk about. And to tell you the truth..... I just wrote a new book, as you know, and in that book,

I don't really go into this, what I'm just going to say right now, which I should have - but I think that - because I just thought about it earlier today - but I think the reason why there's so much pushback is because of the variants of these markers. And that's why, at the beginning of your talk that you just did with listing all these markers, you said, so correctly, you have to do these tests right.

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TESTING

Dr M:

You have to do them fasting. You can't take collagen. You can't take biotin. When you're doing urine calcium, you can't take supplemental calcium for 48 hours before and during the collection. These markers are, all these markers are so sensitive, that you have to have the patient do them just right.

TIMING

Dr M:

If a person is getting the C-telopeptide (CTX), if you don't do that lab draw first thing in the morning, it's going to be wrong. If you wake up at, you know, it's 6:30 am and you drive to the lab and you get your marker done at 7: 30am, that's great.

But if you wait until 9:30 am or 10 am, it's not going to be accurate. For example, C-telopeptide is at its highest at maybe 2 or 3 in the morning, when you're still asleep. And then it starts going lower and lower and lower, and by 2 or 3 in the afternoon, it's at its lowest.

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TIMING continued...

Dr M:

Did I tell you this? I was at the doctor the other day, about two months ago for something else, and she so nicely said, "Hey, Keith, you want to do any other labs?" Which I've never had an MD ask me that before, but it was quite interesting.

She said, "You need any other labs done?" I go, "Sure," So, this is 11:30 in the morning "Throw in a CTX in there." So, I had eaten breakfast, it was 11:30am - my CTX is always at around 380-400. That's where it is, so its a little too high, but it's not terrible, but it's always 380 to 400.

It came back a 99. So, and I go, "Whoa, that's great!" But it wasn't accurate. It was 11:30am, I'd eaten breakfast.

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TIMING continued...

Irma:

This is a really important point, as far as the timing. And that's what the Bone Marker PDF which really is detailed as to when to get the test; fasting; timing, things of that nature. It's not as overwhelming as it may appear, but it's very, very important to understand when. And, if you go to LabCorp, or if you go to Quest, they're going to have different preferences, correct?

Dr M:

Yes, and that is why doctors don't use them. Because they see how variable they are, and they don’t push their patients. They don't understand that they need to push their patients to do these exactly right. They don't take the time to say, "No biotin, no collagen, do it first thing in the morning."

And so therefore, they're all over the map. But if you do it right, then they're helpful. If you do it wrong, it's very unhelpful.

TIMING continued...

Irma:

That's a point that can't be made enough. I like to track things, because that's my personality and some people are that way. Do you ever track your information, or you just write it on a sticky note? (laughs) Like you do with the TBS...

Dr M:

I could be a salesperson for sticky notes.

Irma:

(laughs) All right, so you do the sticky note thing. Vicki, can you share the chart that we created? This is one of the charts that we created and it shows what we're going to talk about some of these tests, the bone-specific alkaline phosphatase and what that is. And these names might be foreign to you, but you put the lab in here, and then you put the Q, or an L, or other, put in a zero or other, the date, the results and the reference range of that particular lab that you're using.

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TIMING continued...

Irma:

And I think then when you go to a bone doctor, like Dr. McCormick, he'll look at this and say, "Okay, now I can really draw some sort of conclusion on this."

Does that make sense, Dr. McCormick?

Dr M:

Yeah, it's great, it's a great tool.

Irma:

Should we dive in?

Why don't we start with that one, because that's one of your favorites, right? The CTX?

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C-Telopeptide of Type-1 Collagen (CTx) - Dr. McCormick's Range 100-375 pg/mL

Dr M:

It is. And it's very confusing when you're talking about terms, because there's, like, it's referred to in six different names. So, it can be C-telopeptide. It can be Collagen Type 1 C- telopeptide. It can be called Beta Laps telopeptide.

It can be called Cross Laps. There's lots of different names for it. And that's confusing to people, but it's all the same thing. So, when your doctor orders it, typically it's just called C- telopeptide or CTX.

Irma:

I would just want to reiterate this point. The point of this meeting today is to educate and to take some of the mystery out of like, "Oh, do I wait between DXAs? What do I do? Do I just have to wait here and get my DXAs and say, 'Oh gosh, it didn't work.' Well, what didn't work?" So that's one of the reasons why we want to dive into the bone markers, to see what's out of whack. So, okay, the CTX - why do you like that so much?

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C-Telopeptide of Type-1 Collagen (CTx)-
Dr. McCormick's range 100-375 pg/mL continued...

Dr M:

Well, not only out of whack, but to make sure that what you're doing is working. So for example, for a medication, if you take a bisphosphonate, well, you want to get a baseline C- telopeptide, and three months into the antiresorptive medication, a bisphosphonate, or Prolia or whatever you're taking, then you need to do it again.

You need to do a repeat. Five percent of the time these drugs don't work. So, it'd be silly to take this for two years and think you're going to get another bone density in two years. And then, "Ah!" I had this one patient and she was on Forteo, and they didn't do pretreatment.

And then three months into treatment to see if - actually for that medication, you do P1NP - but they didn't do that. And at the end of two years, her bone density was actually just worse. The reason was because it didn't work. So she injected herself for two years, didn't work. You know, please don't do that.

C-Telopeptide of Type-1 Collagen (CTx)- Dr. McCormick's range 100-375 pg/mL continued...

Irma:

Please don't do that.

Dr M:

Test beforehand, test afterwards. And when you're doing even just nutritional things, the reason why you do these labs is not only to see what's the best thing to do, but also to see if what you're doing is working. If it's not working, you move on and do something else.

Irma:

Then you can have a voice and say, "Hey doc, this is not working. Let's examine." And there are many people that I have seen, and just as you were reporting, Dr. McCormick, that try medication, it doesn't work. And then they go to another medication, and then they go to another medication. So it's looking for the right medication, if you're going down the medication route. We're not there, at that point. I'm not there, Dr. McCormick was, but this is the information that you will have if in fact you decide to do that. But even if you don't, even if you're not at that point, keep track of your bone markers.

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C-Telopeptide of Type-1 Collagen (CTx) - Dr. McCormick's range 100-375 pg/mL continued...

Dr M:

And it also matters, if you are to a point of a medication, it matters which medication. So, I don't understand how any doctor could prescribe a medication without doing bone markers. For example, if you have a - 3.4 spine - you know, a -3.2 spine, something like that - so you're kind of on the borderline, whether this should definitely be a medication-treated issue or not, but you're just on that borderline.

And your C-telopeptide comes back at 280, 250, is it a good idea to do a bisphosphonate?

Probably not, because it's not going to do that much good. If it was about 500 or 600, yeah.

You know, if we can't get it down nutritionally, then that's an appropriate thing to use an antiresorptive for. But you don't use it for low bone turnover osteoporosis.

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Bone Turnover Markers

Dr M:

Bone turnover is how much activity is going on within that bone, how much bone remodeling is going on. Bone remodeling is a combination of formation by the osteoblast, by destruction of the bone by the osteoclast, and then the osteoblasts come in and form bone.

There's two kinds of bone turnover markers.

1. Bone resorption marker
2. Bone formation marker.

So, we want to see how much activity the osteoclasts are doing. So how much breakdown of C-telopeptide, how much breakdown of collagen, and how much breakdown of bone there is. And then that releases the C-telopeptide into the blood, and then we measure it. It's a measure of osteoclastic activity. Then the osteoblasts come in, form the bone. (remember osteoblasts build bones - osteoclasts clear away bones)

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Bone Turnover Markers continued...

Dr M:

We want to know, "Hey, does this person have bone loss because they just have high osteoclastic? Or are their osteoblasts kind of sleepy and tired and not doing their job?" Because osteoblastic activity increase will increase the P1NP and osteocalcin. So the bone turnover markers are just a way to look at, not only activity of the bone cells, but your fracture risk.

And that's the most important thing that they do. Because some people can have a 400 CTx and some people can have an 800 CTx, and are they losing bone or not - not quite sure, but sure, if they have an 800, their fracture risk is way higher than somebody with a 400 CTX.

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Bone Turnover Markers continued...

Irma:

Going back to a point, which I don't think we can drive home enough, before you go on medication, if that's the route you're taking, you should absolutely have a baseline of the CTX. And the P1NP? Or just the CTX?

Dr M:

If you're going on a bisphosphonates, just a CTX. If you're going to do an anabolic such as Forteo, Tymlos or Evenity (romosozumab) ta P1NP for sure.

Irma:

But not both? If you're doing an anabolic.

Dr M:

Then you could do both, yeah. Then I'd do both.

Irma:

The anabolics...

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Bone Turnover Markers continued...

Dr M:

No, you don't need P1NP, or bone specific alkaline phosphatase, or even osteocalcin if you're just going to do a bisphosphonate. Just a CTX, or an NTX, which is another form of what we're talking about here, we'll get into it later, I'm sure - but NTX, some doctors like the serum NTX, I used to use the urine NTX, but it's not as accurate, so I don't use that anymore. But some doctors still use it, which they shouldn't. But a blood serum NTX, a blood serum CTX is the way you should go.

Irma:

So, what Dr. McCormick is saying is that basically blood, it's a blood test for both the CTX and the NTX. Where urine was originally, it's not as effective or as good, keeping it simple.

Let me go back for a second. One of the things about the DXA is that we take a DXA test way too late in life. You agree?

Bone Turnover Markers continued...

Dr M:

I agree.

Irma:

And as far as you're concerned, what age should somebody take their first DXA tests?

Dr M:

Even at the most expensive at $600, but probably get it at $300 or $200, it's just such a great insurance policy. So, you know, 45. I wish I would have had mine at 45, 40- 45. 50 at the latest. Not 60, you know?

Irma:

There's that whole insurance and Medicare issue as to how often you can get it, how often you can be reimbursed, and to Dr McCormick's point, the cost of it, yes, it's an insurance policy.

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Bone Turnover Markers continued...

Irma:

And I have worked with clients and called radiology, or where they do the DXA and said, "Listen, I'm calling for a non-insured patient, what's the fee?" And they gave me a very cheap price. So, this is within our ability to do, to negotiate. We can negotiate like with the big companies that negotiate with Medicare, right? But not always. As an individual we could ask the question. And if they say, "No, we don't do that," you can maybe move to another radiology, or university...which is usually is better because that's where you'll get your trabecular bone score. So the DXA with the trabecular bone score. So, just tuck that away, we're talking about an investment in your bones and in your health and in your life.

And it could be out of pocket, but you could manage that in some way. I spend a lot of money out of pocket for my health. That's my insurance for me, because I'm worth it.

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Bone Turnover Markers continued...

Dr M:

And a fracture is going to cost you a lot more.

Irma:

It's necessary to go through a couple of times and get the language down and really understand. Okay. So, we talked about the CTx for the bisphosphonates. We talked about the P1NP for the other family of drugs, which is anabolics.

When would somebody do anabolics, in your mind?

Dr M:

If they have low TBS, low trabecular bone score and/or a low bone density. So, you know, when you start getting to a -3.5, -3.6, -3.7, maybe -3.8, you know, that's when I start thinking, "Okay."

If it's a -4, -4.1, -4.2 anything like that, you definitely have to do an anabolic.

Bone Turnover Markers continued...

Dr M:

I don't think an antiresorptive is good enough, because you're just plastering on some density onto a crappy foundation. So, you need to remodel that foundation, get some new quality bone there, and then, that's what's going to kick you forward and you don't have to worry about it as much.

But if you're taking a base that's a -4.0, which remember the bone density is only bone quantity. It's not measuring bone quality. And you know, if it's a low bone quantity and quality, you've got to do an anabolic. And speaking of which, if a person's let's say at a -3.2, -3.3, we don't know, what's the best thing to do? Get a Trabecular Bone Score (TBS) You know, if that TBS comes back, great, because maybe they're a 5'1", 110 pound woman where, you know, the bone density looks worse than it really is, in smaller women. And so we get a TBS, and our TBS looks great, you know, there's probably no reason to do an anabolic.

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Bone Turnover Markers continued...

Irma:

Okay, so let's just break that down. So TBS is trabecular bone scores Dr. McCormick said. Some facilities, usually universities have it. Have you found that other facilities have the TBS?

Dr M:

Not very many. In Massachusetts we have 10 of them, that's it.

Irma:

So a trabecular bone score measures - and this is very simple terms - the inner working of the bone, the lattice of the bone and the DXA measures the outside.

Dr M:

But it’s not another test, it's just a computer add-on to the bone density itself. You don't have to do anything else than just your bone density, and then they have the computer program to analyze that bone density and give you a TBS score.

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Bone Turnover Markers continued...

Irma:

So that's an option that is highly recommended. I do mine at University of Pennsylvania, because they have the TBS, and I want to know everything about my bones. So again, you're on the table, you don't feel anything, you don't even know that you're having the TBS done. Do you recommend people getting the forearm done?

Dr M:

I do but most places don't have that capability for some reason - but yes. And one of the the reasons why I love having forearm is because the anabolics, the Forteo and Tymlos, sometimes degrade forearm scores. So if you have a -4 forearm, then you might want to be a little bit cautious about doing something like Tymlos.

Irma:

Whoa! Okay, that's new information.

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Bone Turnover Markers continued...

Dr M:

Not always, but parathyroid hormone affects cortical bone more than trabecular bone. That's why a lot of people who have primary hyperparathyroidism have low forearm bone densities. Because that's what the parathormone attacks mostly, is the cortical bone, more so than trabecular. And, Tymlos especially, fits into the parathyroid hormone receptor a little tighter, little better than the Forteo drug does.

And because of that, that's why you get 9-10% a year, for the first year of bone density improvement, for Tymlos. And you only get 8% or 9% improvement for Forteo. But because the Tymlos works so well - like I said, it fits in that parathyroid hormone receptor even better - so that means that it may degrade the cortical bone of the forearm. I've had three patients in the last two years where their bone density in the forearm, with Tymlos went from -2.0, which wasn't bad, to -4.0.

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Bone Turnover Markers continued...

Irma:

What?

Dr M:

So, you have to be a little careful, but that's why I'm saying... And that's why it's also important to get a bone density at the yearmark, with an anabolic, not wait the two years. Let's see what's going on and let's see what's going on in the forearm.

Irma:

Right, so get the DXA and get the bone markers. I want to say that when you're getting your DXA tests and you're adding the trabecular bone score, it is, every place is different. And this is the unfortunate thing about this business, the osteo world of bone health, is that it's not everyone's doing the same. You will need a script from your doctor, for a...

Dr M:

The script needs to say TBS on it.

Bone Turnover Markers continued...

Irma:

Script needs to say TBS and it also needs to add forearm. I don't know that there's a script for the forearm, but my script just says "add forearm."

Dr M:

But a lot places don't have TBS. So that part of the script will go unheeded, but that's just the way it goes.

Irma:

Right, and the other problem is, when you call the facility and you ask them if they have a trabecular bone score, you'll probably get Nurse Ratchet (laughs)who's the gatekeeper at the front, who has no idea what you're talking about.

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Bone Turnover Markers continued...

Dr M:

So that's why, when you call, you ask for call radiology. You call the hospital, you say "Radiology, please." And then when the radiology department comes up, then you can say, Do you have DXA with TBS capability?"

Irma:

Right. That's a really good point. Because people get shy away with the response of, "No they don't have it." The other problem that I have found with my clients is that nobody can get, or it's very difficult to get, print outs.

Let’s talk about the bone-specific alkaline phosphatase.

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Bone-Specific Alkaline Phosphatase (BSAP) - Dr. McCormick range postmenopausal women less than 22 µg/L, men less than 20 µg/L

Dr M:

I don't use it a lot except if a person has a high phosphorous.... when I'm trying to make sure... So alkaline phosphatase is produced not just by bones, but it's produced by the liver, by kidneys, by the intestines. So you kind of have to know why a person's alkaline phosphatase is increased. And so for that reason you do what's called a bone-specific alkaline phosphatase. And that will tell us whether, is that alkaline phosphatase increased because of the bones or not. So, and if it is, then we know that they have high bone turnover.

But the reason why I can use BSAP when you're monitoring somebody with osteoporosis, is if they have, if they're on an antiresorptive like bisphosphonate, you want to make sure that it's not over suppressing their osteoclastic activity. So using BSAP is good for that. And the reason why is because, so bone-specific alkaline phosphatase is produced during the mineralization phase of bone formation.

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PRO-COLLAGEN TYPE-1 N TERMINAL PROPEPTIDE (P1NP) - Dr. McCormick's range 30 - 50 µg/L

Dr M:

P1NP is produced during the formation of the collagen. So two different timelines that BSAP and the P1NP are being activated. We want to know when that mineralization is happening, when you're deciding whether a person is being over-suppressed by medication or not. That's why I use BSAP in an over-suppression issue.

So if this person has been on a bisphosphonate, or Prolia, for two or three years, you better see whether they're being overly-suppressed by these drugs.

Irma:

And if you overly-suppressed by the drug, then that runs into another problem.

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PRO-COLLAGEN TYPE-1 N TERMINAL PROPEPTIDE (P1NP) - Dr. McCormick's range 30 -50 µg/L continued...

Dr M:

Well, you need a little bit of calling out of microfractures to maintain good bone quality. If you'd have zero osteoclastic activity, all that's happening is you're building up bone density, because there's secondary calcification going on. It's not primary calcification, it's secondary calcium, just kind of filtering in a little bit, increasing density. Does it increase quality? No, but it increases density. And so we just want to make sure that some osteoclastic activity is going on, to get rid of some of the microfractures that are going on. Over suppression, you're not getting rid of any of these fractures.

Irma:

So we have the osteoblast cell, which is the builder and the osteoclast, which is the cleaner, it cleans out. So just from a very brief little hint there: blast is build, c is clean away.

Dr M:

That's a good... I didn't think of that!

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PRO-COLLAGEN TYPE-1 N TERMINAL PROPEPTIDE (P1NP) - Dr. McCormick's range 30 -50 µg/L continued...

Irma:

You can borrow that, you can quote me. (laughs) And how about osteocalcin?

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL

Dr M:

Oh my goodness. You know, when you talk about osteocalcin you talk about how integrated bone is to the rest of the body. And, you know, my new book is all about how bone is the center of your universe. And that is, it is the center of how your body works in total.

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

For example: So osteocalcin is produced by the osteoblast and the osteocytes. So the osteocytes are, they're older osteoblasts that have embedded in the matrix of bone. And they kind of, the osteocytes - we haven't talked about that - but they essentially, they run bone remodeling. They are the ones that govern how the remodeling is going on. And they produce the osteocytes and the osteoblasts produce osteocalcin, and osteocalcin, once it's become carboxylated, or changed with vitamin K, it becomes a nucleator for the hydroxyapatite crystal.

Irma:

So, carboxylated is changed. I mean, that's just bringing it down to simple terms. So...

Dr M:

It's changed so it can work in this manner. And that is to form the crystal of bone. It also instructs the bone formation process on how to align these crystals within bone.

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

So it's pretty important. And it's important that you have the vitamin K to make it so it can do these things. And then once the bone is made... Yes, I think, you know, I can see in the look in your face, how excited you get, and I get so excited about this too. I mean this is

Irma:

...because it's a miracle, it's a freaking miracle.

Dr M:

It's such a miracle that this happens and we muck it up a lot of times with drugs. (laughs) But, it is miracle. And so, this carboxylated, vitamin K-carboxylated osteocalcin gets embedded then within the bone that you make. And then seven years later, when that bone is now remodeled again, the osteoclasts come and they break down that bone, they get rid of all the microfractures.

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

And as they're breaking down the bone, and the acid that they put on that bone to break it down, releases that osteocalcin, takes away that carboxylated form of the osteocalcin, makes it uncarboxylated, that uncarboxylated osteocalcin now goes to the brain. It helps the brain form serotonin for mood stabilization, it helps the brain make dopamine for pleasure. It helps the brain and the nerves in the brain produce neurotransmitters. It goes to the pancreas, helps the pancreas regulate energy for insulin production, for energy production. It goes to the intestines to regulate another hormone called Glucagon-like peptide 1, which helps calm the intestines and make it so there's not so much peristalsis going on, so allows for more absorption of nutrients. It goes to the testicles and helps them produce testosterone. And all these are not huge amounts of input, but it is input to all these structures. And I think the way you have to look at osteocalcin, and bone in general is that it makes sense that bone would regulate your energy production.

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

Why? Because it is a huge amount of energy that it takes to feed these osteoclast and osteoblast to constantly just be turning over bone. You know, every 7 to 10 years, we have a whole new skeleton. That's a huge amount of energy that takes to make these cells, to allow these cells to do their job. So it makes sense that... And that the skeleton itself is a storage place for calcium.

It's a storage place for fat and energy. So when times are lean, there's no food around, then it's going to do one thing. It's going to kind of sequester things. So for the times when things are better, that, you know, you don't need sequester, but they are regulating your whole energy system. And it makes sense, because they are a storage form and they also regulate energy from fat, from pancreas, from everything else. So, and the osteocalcin is just a good way to understand that whole connection to energy regulation.

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Irma:

One small question opened up this huge understanding about the importance of osteocalcin and how the mechanism works.

Dr M:

And the importance of your bones and how that's important to the health of you in many, many ways. If you have good bone health, you're going to have good other health too, from the rest of your organs. Not always, but a lot of times.

Irma:

When you say that the bones are made over every 7 to 10 years, I'm thinking to myself, "Okay. So I have osteoporosis and in seven years I won't have it anymore!" But that's not true.

Dr M:

No, because it's not just the bones that are being affected. You have to realize that it's more. For example osteoclast. They're a form of a white blood cell. They're a part of your immune system. Your immune system was developed when you were three years old, but that's going to follow you along the way.

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

So how your immune system works goes into the mix. So you can't just say, "Okay, I'm starting with a perfect body here at 43. I'm going to do everything I want. And in 7 years, Dr. McCormick says, I'm going to have a new skeleton and everything's going to be okay." That's not true. Because we have history. And that history is back to the first three years of our life when our immune system was being developed and how the bugs in our guts, in our intestinal tract are, how the cells within our, the lining of our cells work, and interact with the bacteria in our gut, how those all that regulates your immune system and all those cytokines, all those different chemicals that the immune system uses to talk to each other, the T-cells and the B- cells, and every single inflammatory or anti-inflammatory cytokine, that's out there, all that noise, all that chemicals you're talking that's going on, the osteoclast are listening to it.

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Irma:

You know, I'm struck by, because I've been on many of the intakes with private sessions, with my clients as their advocate and you'll be quick to come up with a scenario.

Well, at least what the bone markers are that you want to have done. And what's behind that is what we're learning right now. It's like this massive amount of knowledge that says, "You know what, let's do an osteocalcin," or, "You know what, let's do..." Right? But I just look at it as like checking the box.

“Okay, that's what he wants." But now we're beginning to understand why you want those bone markers. Let’s get into that for a second. Let's say a patient comes to you and they're sort of average, they're losing bones are a - 3.5. Let's say they're 65. And the health history is okay, they don't have any major problems.

Maybe they have some gut issues because everybody does. But, how do you know? How do you know what to do? What do you do?

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

Because I've been doing it for 20 years, I don't know?

Irma:

What, is it gut? Is it a gut feeling? No?

Dr M:

Well, that's a good question. I mean, there's certain things I kind of do with everybody, you ask some questions and it just fits in a certain way. If I'm thinking ahead, and I think ahead on a lot of levels, and I think to the side a lot of levels, just kind of all at the same time. And if you're thinking ahead that there might be a anabolic medication involved here, that we're going to do, I'm going to get that P1NP. If not, I don't.

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

If I'm thinking ahead that we're gonna do a bisphosphate, I might get that osteocalcin or that bone-specific alkaline phosphatase, you know, just make sure we're not going to do an over-suppression later. But yes, there's a core amount of labs to get, and that's what you have on your list, that there are certain labs that are just kind of like, "Okay, this is basic. Let's get this for pretty much everybody." And then I tailor it. We might get a few more with some people, like if they're going to do Forteo, I might do an insulin-like growth factor 1 to make sure that they don't have an IGF1 resistance, like you have insulin resistance. I want to make sure that Forteo is going to work. So, there's nuances, you know, particulars that you want to do with certain people.

Irma:

But here's the thing. So, you do all this focus, right? You're in the marrow of their bones and you suggest,

"Okay. From my experience of 20 years and writing two books, this is what I suggest you do." But you can't write the script for that. Right?

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

I can, I just can't go in through insurance.

Irma:

What? You can write a script for the medication?

Dr M:

No, no, no. Just for the labs.

Irma:

Right, right. And that's a really important point.

And we could talk about that in a minute, but you can't write the script for the medication. So, then the patient takes her case and goes to an endocrinologist that says, "Wow, I don't think so!" Then they have another level of discussion or argument. What do you do?

OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

But the nice thing that I've found about endocrinologists is and I don't mean to say this mean-like, but lot of times they don't know what's going on. They don't have an in-depth knowledge of osteoporosis, a lot of them. Some of them do, some of them don't. A lot of them are diabetes doctors. And so they don't have that much knowledge. And they will essentially allow the, the customer, the patient, to dictate, especially if that person knows a little bit, and knows when they go into the endocrinologist and they can share "Yes, I know a lot about bisphosphonates, Prolia. I know how much bone density they give me. I know that certain ones give me qualities, certain ones don't."

My advice go in armed with a little bit of knowledge, and then you can have a conversation with the MD and not just be told what to do.

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Irma:

And there's that fine line between showing up as a know-it-all and, "I'm going to show you doctor, I don't care about your medical degree." No, you want to partner.

Dr M:

Yes, I'm not saying to do that.

Irma:

No you're not saying that, I know.

Dr M:

We want this doctor to be on our side. We want them to be on our team. They're very, very valuable. They know a lot, but they just don't know, some of them, just don't know about all the really little intricacies of these drugs and how they can be used.

Irma:

A rheumatologist versus an endocrinologist?

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OSTEOCALCIN - Dr. McCormick's range 8-32 ng/mL continued...

Dr M:

I don't think it matters. When I go to a bone meeting of some kind, there's usually 90% endocrinologists and 10% rheumatologists.

It's just, some doctors emphasize osteoporosis and some doctors emphasize rheumatological diseases or diabetes.

VITAMIN D - Dr. McCormick's range 30 - 50 ng/mL

Irma:

Because this is about bone markers, let's talk about vitamin D. Did you read that vital study, or you know, what's circling around, as far as, "We don't need vitamin D anymore, you don't need to test it"? Are you aware of that? No? Okay.

Dr M:

Michael F. Holick, Ph.D., M.D Boston University Medical Center, he is really taking this to a new level. And I do think that it was inflated a little bit in the importance.

Yes, you need vitamin D. I certainly don't think you need more than 60 nanograms per milliliter, you should be between 40 and 60. But, yes, it's important. It does a lot of things. So, for your immune system and for your bones.

Irma:

You were talking about the lab that you use it's called what? Exa- something? Exa... you know, where you can write scripts for bloodwork?

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VITAMIN D - Dr. McCormick's range 30 - 50 ng/mL continued...

Dr M:

Evexia. I can't go through their insurance.

Irma:

Right. They can't go through the insurance, but it's quite reasonable.

Dr M:

It's unbelievably reasonable.

Irma:

Unbelievably reasonable. I mean, the whole vitamin D conversation is mind boggling to me because Quest, without a script, they were talking about $244. Life Extension is also another place you can get your own blood work done, and oftentimes they run sales. Life Extension was offering it for $35. That's quite a difference. Do you suggest getting tested twice a year, right? At the end of the summer...

VITAMIN D - Dr. McCormick's range 30 - 50 ng/mL continued...

Dr M:

For vitamin D? For vitamin D I just tell people, test if they're in the Northern Hemisphere, to get it in February, March, April. So just once a year.

Irma:

Just once? I do it twice.

Dr M:

But to me, it's like, that's the lowest point at, you know, in the winter, the end of winter. It's the lowest.

Irma:

I like to do it in the end of the summer and the end of the winter because I want to see if I'm taking the right amount. I like to track it, because then I know. During the winter I take 5,000, and then if I take 2000 during the summer, maybe I need a thousand. So each thousand that you take, it takes a couple of weeks to change the vitamin D level. But each thousand, adjust the number by 10 nanograms per milliliter.

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VITAMIN D - Dr. McCormick's range 30 - 50 ng/mL continued...

Dr M:

Some people need 5,000 to win, some people need 1000 to win, some people need 7,000 to win. So...

Irma:

Right, and it depends on the vitamin D receptors, right? I mean, whether or not somebody is able to absorb it through a capsule or they have to take it in a liquid form.

Dr M:

And I mean, now it's a lot better, 20 years ago, the testing was just terrible. I mean, you could not trust any vitamin D test. But now it's much better.

Irma:

Does it matter which lab? Quest or LabCorp?

Dr M:

I don't think so.

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IONIZED CALCIUM - Dr. McCormick's range 48 - 56 mg/dL

Irma:

Alright. How about ionized calcium?

Dr M:

So, calcium is bound by proteins and minerals in your blood. And then there are others that are free, it's not bound by anything. If your albumin's really high or low, it's going to affect your total serum calcium. Total serum calcium is that that's bound by a protein, that that's bound by minerals, and that's free. Sometimes total serum calcium, which is on your CMP, or Comprehensive Metabolic Profile, can be right on the borderline of, "Oh, it's a little too high, but it's not out of the range," especially when you're talking about primary hyperparathyroidism. So you want to know, the range for total serum calcium, that the typical reference interval is 8.7 to 10.3 or 10.4. If you're a 10.3 all the time and you don't have osteoporosis, then it's okay, probably.

IONIZED CALCIUM - Dr. McCormick's range 48 -56 mg/dL continued...

Dr M:

If you're a 10.3 or 10.2 or 10.1, and you have osteoporosis, then it could be a problem. We want to look at that closer. If it comes back at 10.1 and we don't know what's going on, we get an ionized calcium, because that's not effected by these other things. That will give us a clear reading of, "Is this abnormal or is it not abnormal?" Mostly you use Ionized calcium if you're trying to differentiate between a person that might have primary hyperparathyroidism.

Irma:

And you use the standard blood work? Do you look at the CMP and just track those things as well? Because when you do an intake, you want to see all the blood work.

Dr M:

Yes CMP and CBC are great. I mean, they're dirt cheap and they tell you a lot.

Irma:

They have a big story. Okay. And that's important.

CELIAC / GLUTEN SENSTIVITIY

Irma:

And now, celiac. It's important to test for celiac, and then you can go through all the IGGs and the IGA, but that's an important test unless you are off of gluten? If you're off of gluten, do you still test?

Dr M:

Sometimes when a person has some digestive issues and they have really bad bone loss, even though they're gluten-free, I'll test it anyhow, because as you know, sometimes a person can just go to dinner and they're so sensitive that they go out to dinner at a restaurant, even though they ordered gluten free, but there's gluten contamination and it'll set them off for a month. So it doesn't take much for some people, they're incredibly sensitive. For those people I might test.

HIGH-SENSITIVE C-REACTIVE PROTEIN (CRP) - Dr. McCormick's range less than 1 mg/L

Irma:

The CRP, you order the high-sensitive CRP, do you want to talk about that?

Dr M:

It's just C-reactive protein, you can get that, but if you really want to make sure that you're seeing it at all levels, even at the lowest level, then you get a high-sensitive C-reactive protein. It's the same protein, it's just a much better assessment of it because it's like the estradiol. I never get an estradiol, I get a sensitive estradiol. Because, an estradiol, when you order estradiol, it's going to come back, it might say 25 or 30, or something, but also might say "less than 20", but there are numbers between zero and 20. So I want to know what it is. I want to know if it's a 17 or a 7 and that's the sensitive or ultra-sensitive estradiol. The same thing with high-sensitive C-reactive protein.

HIGH-SENSITIVE C-REACTIVE PROTEIN (CRP) - Dr. McCormick's range less than 1 mg/L continued...

Dr M:

I want to know exactly what it is, and that will give me a little bit better indication if I order the high-sensitivity C-reactive protein versus a C-reactive protein. It's the same thing, just like the estrogen is the same thing, it just gives me a better reading.

Irma:

That's very, very clear. Do you see any patients that don't have a gut issue?

Dr M:

Yes.

THYROID - Dr. McCormick's range 0.5 - 4.5 mU/L

Irma:

Then of course you test for the thyroid.

Dr M:

I usually mostly just do TSH because I'm not a thyroid doctor and I'm sure if I was working on somebody's thyroid, if I was really addressing a thyroid issue, then you'd get T3, T4, T3, appetite, the whole panel. But I don't, that's not my game. So I just really want to know what that TSH is. If you're on a medication, a thyroid medication, and it's a little too high and it's driving that TSH down below 0.5, then that can cause bone loss.

If you have hypothyroidism and your TSH is up to 7 and 8, 9 and 12, that can cause bone loss. So there's a sweet spot between 0.5 and 4.5 or so. So we want to try to keep somebody there.

24 HOUR URINE - Dr McCormick's range women less than 200 mg/24 hours, men less than 250 mg/24 hours

Dr M:

So all day long, you have X amount of calcium in your blood. We already just talked about total serum calcium, 8.7 to 10.3 or so. So there's calcium in there. And that calcium in your blood is being run through your kidneys, 24/ 7. Just all the time, there's blood going through your kidneys. The kidneys pull out certain things. They put back certain things. So there's about 10,000 milligrams of calcium that run through those kidneys every day. That's a lot of calcium. Because the blood's just turning over, and it's putting back in most of that. But some of it, it takes out, about 200 milligrams and you lose that in your urine.

But sometimes there's problems with kidneys and sometimes there's problems with your pH and the inflammation that's going on in your body, nutrients that will cause the kidneys to lose a little bit more than they should. And so that's what you're testing in a 24-hour urine calcium. It could just get a spot urine calcium, isn't good enough, you have to pee in a bucket for 24 hours and have that analyzed.

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24 HOUR URINE - Dr McCormick's range women less than 200 mg/24 hours, men less than 250 mg/24 hours continued...

Irma:

That's not as difficult as you think it is. I did that twice and what I found the easiest thing to do is that I have a glass jar that's in a bucket with ice to keep it chilled. And then I dump it into that orange container...

Dr M:

And you just put a sticky, a yellow sticky on your forehead...

... that says don't pee in the toilet...pee in the bucket.

Q+A

Question:

if your not on bone meds. are there reasons to test bone marker with a low bone density, but not diagnosed with osteoporosis?

Dr M:

Sure. Because you want to know if you're losing bone rapidly and if what you're doing is working. I don't care if you're working completely with nutrition or you're working with a medication, you want to know what you're doing is working.

Irma:

Well said.

Question:

"Why do anabolics degrade forearm scores?"

Q+A continued...

Dr M:

You can't say anabolics degrade forearm score, you can say that the parathyroid analogs, Forteo, and Tymlos, not Prolia, which really is an antiresorptive, but does have a little bit of bone quality to it. But then the other romosozumab, which is Evenity, that's an anabolic at least for the first 8 months, 9 months of use, and then it becomes an antiresorptive, so it's kind of a dual medication. But the Forteo and Tymlos, the reason why they can, not always - they don't always, for sure, and most of the time they don't degrade it - is because they are parathyroid. So the reason why these two drugs work is because you inject a bolus of this parathyroid, this recumbent DNA parathyroid under your skin, 20 micrograms, it's there in your system for 45 minutes to an hour, and then it's gone. And so it stimulates the osteoblasts and they build some bone. And then by the time the osteoclast, because they're a little bit sleepier and a little bit dumber, by the time they smell that parathyroid in the blood, it's gone. And so they say, "Wow, I thought I smelled some parathormone there, which kind of excites me and makes me want to tear down bone.

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Q+A continued...

Dr M:

But now it's not there. So now I'm not going to tear down bone." So it stimulates the osteoclasts a little bit, but it really stimulates the osteoblast much more. The problem is if you are one of those people where it lasts in your blood a little bit too long, now it's going to stimulate those osteoclasts to break down the cortical bone. And we don't know who you are. And that's probably why Tymlos might have a little bit more of a breakdown of the cortical bone than the Forteo, because it works a little bit better.

Irma:

A question from Jill:

"How long should one be off biotin before they take bone marker tests?"

Q+A continued...

Dr M:

The literature says 12 hours. I say 48, just to be sure. The literature says 10 milligrams. I say 3 milligrams, because I know in my - I have a product called Osteostim - and in that I have 3 milligrams and I know that that affects people because people have forgotten and taken it and then, you know, then it affects the bone resorption markers. And so I go, "Oh, that's a little weird, though let's retest it." And they stop at 3 milligrams and, you know, it's different.

Irma:

The point is is that if you're doing any of the bone marker tests, you have to look at the supplements that you're taking.

Dr M:

"No biotin, no collagen." I don't say, "Look at all your supplements, because it might have biotin in it," but they should.

Irma:

Jill's next question. She went from Tymlos to Reclast and the bone markers went down a lot and the doctor says that that's normal.

Q+A continued...

Dr M:

Yep. That's the way it should happen.

You want those bone markers to go down because that's what the Reclast is doing. The Forteo or Tymlos increased both P1NP and the CTX or the NTx, whatever.

And now the Reclast is going to come and squash that down and decrease the osteoclastic activity.

And as you decrease osteoclastic activity, osteoblastic activity naturally comes down with it because these two types of bone cells talk to each other.

Question:

People want to know the name of your book and when it'll be out?

Q+A continued...

Dr M:

It's called Better Bones and I'm hoping maybe by end of September, October, something like that. Its long, and dense, and there's a lot of information, and it'll be a little too much for some people, but I wanted it to be in-depth, and it's gonna take people to a new level of understanding.

Irma:

And that's important. That's why these webinars are so important because you get the language down and you get the terminology, it starts rolling off your tongue a little bit easier. You could talk to your doctor about these things. The first time it felt like Greek, but now I feel, "Okay, I could actually talk about osteocalcin or I could talk about a CTX."

And it may be that people just take the learning in their own "bite-size piece" way.

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Q+A continued...

Dr M:

Unfortunately, osteoporosis, you really do need to pay attention to this and really do need to understand it, because unfortunately, a lot of doctors don't take it that seriously and they should. They're not going to give you the time of day, they're not going to go into this in-depth with you. It is a lot of time, but in my new book, I give it to you. It's like, "Okay, this is a lot, a lot, a lot of years of figuring all this out and it's all in one place and you don't have to go everywhere to figure this out.

It's there." And I try to explain it as simply as I can, even though it's really complex, and it will benefit you in the long run, because you don't want to have fractures. It does really crimp your lifestyle. It does really. It's not just pain of having a broken bone, it decreases your function.

Q+A continued...

Irma:

How does collagen affect the CTX?

Dr M:

Good question. It probably does, I'm not sure. I mean, it might actually even even increase it because it's stimulating your osteoblasts. You think of it as it's going to increase P1NP. It might even increase CTX, but not a lot. But it's just improving your bone formation. And so I wouldn't use it to bring down CTX.

Irma:

Thank you everyone for your time and your focus.

FoodForHealthyBones.com is Irma's website. Or if you type in my name, Irmajennings.com into a browser and that brings you to Food for Healthy Bones.

There is one thing in closing that I want to say. When I listen to Dr. McCormick talk about the nuances of bones and what it takes to support your bones. I think about whole, nutrient- dense, bone-loving, calcium-rich foods.

Bones need 20 vitamins, minerals, protein, and fat, to support bones. And that's why it's important to be aware of the food you're eating, Organic as often as possible, rotating your food, not just mono eating. and to have a good wholesome diet.

Dr. McCormick's website: osteonaturals.com
This is where you'll find Dr. McCormick's latest blog posts, his bone supplements, and consultation information.

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Thank You...

From my bones to yours...

Irma Jennings, INHC

Your Holistic Bone Coach

Food For Healthy Bones®