

Amber-Nicole Bird, MD (Host): Hi, everyone. Welcome to the Penn Primary Care Podcast. I'm your host, Amber Bird. And I'm joined by my cohost Rani Nandiwada and today we are very pleased to be joined by Mona Al Mukaddam, an Endocrinologist at Penn and expert in osteoporosis.

Osteoporosis is one of the more challenging things internists manage in their practices and something we are often asked about by patients. So, we thought we would have Mona on to help us answer some of these common questions.

First, I want to take some time to allow everyone to introduce themselves. And so you can get familiar with their voices. As I said, I'm Amber Bird. I'm a General Internist and Primary Care Physician here at Penn.

Deepa Rani Nandiwada, MD: Hi, everybody. I am also similar to Amber, a General Internal Medicine Doc does mainly outpatient work, some inpatient work at the Penn Center for Primary Care. Amber you did a great job with my last name. Between myself and Mona, you had the last name challenge up to par and then Mona, why don't you tell us a little more about yourself?

Mona Al Mukaddam, MD, MS: Hi, my name is Mona Al Mukaddam, and my patients know me as Dr. Mona. So, don't worry about not pronouncing my last name correctly. I'm an Adult Endocrinologist and I'm the Director of the Penn Bone Center. And my outpatient practice is limited to patients with metabolic bone diseases and calcium disorders. Thank you for having me.

Dr. Bird: We're really happy to have you all with us today. And in this episode, we want to review some of the common challenges and scenarios we face in advising patients with risk factors for osteoporosis, as well as patients diagnosed with osteoporosis. So, as we do on all of these podcasts, we're going to start off with a case.

So, recently we saw a 58 year old woman, an Asian-American woman who had been a ballet dancer, all of her life. She's petite in stature. But very active, still dancing ballet daily. She already had a DEXA scan before showing up to our office. And it showed osteopenia in one area, but it showed no T scores in the osteoporosis range. She was very concerned about doing everything she could to avoid osteoporosis developing in the future.

So, Mona first, I think we just want to take a step back and think about how you advise patients who are at risk for osteoporosis, or have maybe already been diagnosed with osteopenia. In this case, a woman who's younger than the normal age of 65 that we would traditionally consider for screening, on ways to reduce their risk of loss of bone mass.

Dr. Mukaddam: Yeah. Thank you. I mean, this is a very important question because we do get a lot of patients that might have gotten a DEXA scan and it was not indicated.

It is important to review that the guidelines currently recommend routine screening for women ages 65 and above. But we also do recommend screening for younger patients if they have risk factors.

So, what are risk factors for osteoporosis? If someone is very thin and they have a low BMI, if they have family history of osteoporosis and fractures, if they have history of eating disorders, and they had a low BMI or history of amenorrhea, and if they're on medications or have any health issues that could compromise their bone health.

And so there's a lot of reasons why we might do earlier DEXAs, but it's important in our patients to recognize, does she have these risk factors? Was this DEXA kind of really warranted or not, but she's here, she's in your clinic and she's very concerned about this term osteopenia.

The first thing that I would like to highlight is that we don't really like that term osteopenia. We do use it. It's in almost all the DEXA reports, but we try to say it's low bone mineral density because osteopeniac seems to give it disease. It's like you're giving the patients disease, which she does not have a disease. She has a low bone mineral density. So, first I tried to do kind of the education aspect of it.

And I try to go over, what is osteoporosis and why do we care about osteoporosis? What we really care about is, someone's risk of having a fracture. What we really care about is preventing someone from having a fracture. She's 58. Her risk of having a fracture probably right now is not very high, but the things that she can do to optimize her bone health and prevent her from having fractures in the future, are really lifestyle changes. So, I do talk to my patients about adequate calcium intake. So, about 1200 milligrams of calcium a day, which is a total of what she gets from her diet and supplements. We try to favor more dietary ways than supplements.

I do a check a 25 hydroxy vitamin D on my patients. I know that you know, adequate vitamin D is very controversial, but you definitely don't want them to be vitamin D deficient. And I do recommend vitamin D replacement in someone who has low vitamin D levels,

Dr. Nandiwada: And Mona what the vitamin D, what levels of vitamin D do you use, like, what dose of the vitamin D do you usually recommend for your patients?

Dr. Mukaddam: Yeah, so the recommended amount is 800 units per day of vitamin D. And you can usually recommend that. In patients who are osteoporotic, I'm usually aiming for about 30 to 50. The Institute of Medicine usually recommends, you know, above 20 is fine. We, as endocrinologists -- we continue to like to push it a bit higher just for the seasonal variations or if someone, sometimes patients forget to take their vitamin D we like to have a bit of a, more of a buffer.

Dr. Nandiwada: And this is D3, is the formulation correct?

Dr. Mukaddam: So, there's vitamin D2 and vitamin D3. What's available usually over the

counter is mainly vitamin D3 and that's the one that's better absorbed. But a lot of times, if patients have severe vitamin D deficiencies and you're prescribing ergocalciferol, which is vitamin D2, that's the one that is cheaper and covered by the insurance. And so that's when you're doing the 50,000 units once a week. And that's formulation is okay as well.

Dr. Bird: And I guess, Mona, before you go on to continue talking about ways to advise our patients, you know, you mentioned labs that you're checking here and I think it might just be helpful to hear all of them now. So, it sounds like definitely a vitamin D you know, this is a question in primary care that comes up often, like what panel of labs, should we be sending on patients once we know they have low bone mineral density and for you, is that different if they have a diagnosis of osteoporosis?

Dr. Nandiwada: I actually just do the one that says vitamin D screening panel crossing my fingers, that it covers everything, but your thoughts on how to interpret all of those and other ones would be so wonderful.

Dr. Mukaddam: So, you know, it all depends on the patient. I think if someone has low bone mineral density and it's very mild and my critique score is -1.2 or 1.3, I'm usually not doing that much of an extensive evaluation. You're probably are getting comprehensive metabolic panel on most of your patients or a CBC. I would add on a 25 hydroxy vitamin D. And that would be more than enough.

If someone does have osteoporosis, I do the basic evaluation would include a comprehensive metabolic panel, a CBC, a 25 hydroxy vitamin D, the parathyroid hormone level. I do recommend checking magnesium and phosphorus on all of our patients. And those are not included in the comprehensive metabolic panel.

And in patients who do have osteoporosis, I do check a 24-hour urine collection for calcium and creatinine to make sure that they're not losing calcium in their urine. And to make sure that they're not having any problems with absorption and they don't have very low calcium levels.

The kind of like basic evaluation that I would do. If I feel someone has very high risk of osteoporosis, has multiple compression fractures in their spine, that's when I'm screening for Cushing's, I'm screening for multiple myeloma. I'll check for celiac disease. I'll even screen for sometimes mastocytosis.

So, there are other things that I do if patients have very severe osteoporosis or unexplained fractures. I'm doing a much more thorough secondary evaluation. I think as primary care doctors, if you have such complicated patients, you would definitely want to refer those patients. But as a routine, you know, labs, you would do the comprehensive metabolic panel, 25 hydroxy vitamin D and magnesium, phosphorus, parathyroid hormone level, CBC, and a 24-hour urine calcium and creatinine.

Dr. Nandiwada: I love that. I'll admit I don't always get the PTH and the phosphorus. I don't know about you, Amber, the rest, I think I got and the 24-urine, I don't think about as much

as I probably should. So that's really helpful.

Dr. Mukaddam: Well, the 24-hour urine collection usually comes with an apology because patients really don't like to connect to the urine over 24 hours. So,

Dr. Nandiwada: No one does.

Dr. Mukaddam: And so you also have to think about your patients. Are they going to do it or not? I mean, if someone's very busy at work and they're not going to do with, it's fine. And you know, my older patients who are in the eighties or nineties, they're just not going to be collecting urine over 24 hours. And so, you definitely have to think about your patients when you're ordering these tests. If they're going to actually do them or not.

Dr. Bird: Great. So, I think that was really helpful and I think will help all of us as we begin our basic lab orders before considering initiating therapy. I think Rani had some questions about exercise specifically.

Host 2: Yeah, I definitely do. I have so many lovely little women who come and they're, you know, post 65, we've diagnosed them, you know, with osteopenia or even I'm now going to change my phrasing, not with osteopenia, but with low mineral bone density.

Dr. Mukaddam: Yeah.

Dr. Nandiwada: And I, you know, talk to them about the vitamin D. I talk to them about the calcium, and then there's always this, you know, this weight-bearing exercise component that comes in. I know for a lot of my patients, especially where I'm worried about frailty and stuff, I actually advise them if they can afford it, which is a hard part of this to get a personal trainer or someone who can teach them how to do the exercises safely in a way where they won't cause further injury.

But what do you advise your patients when you're thinking specifically about exercises either a preventative measure or even therapeutic for a patient with osteoporosis?

Dr. Mukaddam: I think whenever I see a patient with osteoporosis and usually of course, the patients that are coming to me are already osteoporotic and are sometimes either very high risk or they're very reluctant to take medications.

Dr. Nandiwada: I've sent you a couple of those.

Dr. Mukaddam: Of course, you know, this is what I deal with every single day, but you know, a lot of patients are really reluctant to take medications and they're always looking for non-medicinal ways to treat their osteoporosis. I really always try to highlight the importance of lifestyle, of calcium, vitamin D, avoiding things that are bad for your bones and exercise. I say exercise is extremely important. However, most of the time it's not enough.

So, what I try to tell my patients is that these are all, they work complimentary. It's not either, or. And in terms of what exercises they can do, that really depends also on the patient.

If I have a 58 year old, like, you know, the first patient that we presented, who is young and healthy, and she's a ballet dancer, I'm not going to now limit her exercise and say you can't do certain exercises. I would encourage her to do impact exercises. So, low impact or high impact should be fine for her. So, running or jogging or walking, those are very good for osteoporosis because the impact actually causes vibration, which stimulates osteoblasts, the bone formation cells. And so you can have bone formation from impact exercises.

We talk about core strengthening exercises, balance exercises, and some light upper body weight exercises. So we, I highlight exercise a lot with my patients. If I have an older patient that has pretty low T scores, especially in their spine, I'm worried about them having spontaneous compression fractures. So, then I talk about, you know, don't over bend your spine. Don't over-rotate your spine cause that can cause injury and fractures. And so similar to what you said, Rani is I, sometimes I routinely refer my patient to a physical therapist who have experience with patients who have osteoporosis, who don't necessarily look frail or like, they're going to fall, but those patients that want to be proactive about doing the correct exercises that would help stimulate bone formation and not cause injury.

But what is important to note is that all these studies on like exercise can improve maybe bone mineral density, but none of them have been shown to be effective at fracture reduction. So, if someone is at higher risk of having fractures, they need to be on medications, in addition to everything else that we talked about.

Dr. Nandiwada: That's actually so helpful. Cause I have so many patients who want to see, they're like, oh, you know, I got my DEXA, it's stable, the exercise and lifestyle and non-medicine options are working. And I always struggle with how to convince them that it's not. You know that I'm still really worried about them, even though it's stable, as we're doing that negotiation of like, I don't want to do meds and we're like repeating the DEXA to say, you know, is this stable? Is this not? But I think framing it in terms of like, yes, this is helping, but you're still at a fracture risk regardless, without medications is really helpful.

Dr. Mukaddam: One thing that I wanted to note which I find very important is that a lot of times I can't convince patients during the first visit, but I set the stage for next visits where I tell them again, what I care about is your fracture risk. And unfortunately, as we get older, even if your bone density continues to be exactly the same, your risk of having a fracture increases with time. So, the strength of my recommendation for treatments will increase with time. I try to set the stage from the first visit.

So, that's when they come to see me next year or the year after, and their bone density continues to be stable. I'll tell them, but you're older now. And your risk of having a fracture is even higher. So, I think all of these things are very important and really allowing the patients to understand that we care about fractures, not just numbers.

Dr. Bird: I think that's really helpful. And what I will add to kind of my counseling is that idea that this is even if it's stable, their fracture risk is going to increase over time. And I think we do that a lot with thinking about statin initiation, you know, age is such a large risk factor that even if people don't want to start a medication right away, we're counseling for the future. And I don't universally do that when I'm talking about bone density.

Dr. Nandiwada: With this idea of somebody who's osteopenic, you have one extreme where they don't want meds, but there is some data question in terms of, even with osteopenia thinking about, should we start them on medication? And so in that light, where do you stand Mona?

Dr. Mukaddam: There was initially, you know, the thought of how do we prevent osteoporosis. Like I want to prevent osteoporosis, let's start medication early just to prevent osteoporosis. And really we've shifted our treatment now to thinking about how can we prevent fractures. And I only start patients on medications if I feel that they're at higher risk of having fractures.

So the treatment guidelines are as such. You treat people who have osteoporosis either as defined by their DEXA scan or by history of fragility fractures, and then people who are in this osteopenia range, that's when we use FRAX.

And FRAX allows you to incorporate their age which is a huge determinant of their risk of fracture and other risk factors like if their parents have had a hip fracture, if they're on steroids, if they drink excessive alcohol, if they have a low BMI, have they had fractures in the past. And so you're looking at different risk factors and you're calculating what is the risk of having a fracture in the coming 10 years? And so you're able to risk stratify them. And if they're at high risk of having fractures, then I would recommend treatment.

Dr. Nandiwada: All right, Amber, I'm going to pass it back to you to think about some of our next steps with her.

Dr. Bird: Yep. So, we're just going to wrap up with one last question, because we do have another case we want to get Mona's expertise on.

So, just a final question on this. We counsel her, we have some lifestyle changes she can make in terms of nutrition and staying active. We're going to get her into physical therapy just to make sure she's exercising in a healthy way. But I think one question that comes up is now that we have this diagnosis of low bone mineral density, when should we be checking a DEXA again for these patients? I feel like we have some frameworks when somebody is diagnosed with osteoporosis, but here are we using the severity of their low bone mineral density to make that decision?

Dr. Mukaddam: I think what we're referring to it, what we can use is the New England Journal of Medicine Paper that was published in 2012 where it looked at women 65 years and above, and they looked at their T scores and what was their risk of transitioning into

osteoporosis. And what they found was people who had normal bone density or what they refer to as mild osteopenia, meaning that the T-score was between minus one and minus 1.5. So, this is like mild osteopenia, that the risk of transitioning to osteoporosis was like 15 years. And then people who had moderate between 1.5 and two, then this was five years. And then if they have more advanced osteopenia, meaning between minus two and minus 2.5.

You know, one year follow-up made sense, but what's important to note is that these were in women who were 65 and above. And so if they've reached the age of 65 and they have normal bone density, then yes, of course their bone density is not going to decline that much. In this patient who's 58, she already has osteopenia. And I would like to know what the trajectory is going to look like.

So with a patient like that, I would actually bring her back in two years and do another DEXA scan. Because when I'm looking at her, now it's a time once snapshots. Right. I know that her bone marrow density is low, but I don't know if she's actively losing bone now or is it because during her adolescent years and her twenties, she was a negative energy balance. She was an athlete. Wasn't getting her periods. And so she never reached this kind of peak bone mass that she should have acquired. And so she was just starting off at the lower baseline.

So, having that followup DEXA in two years will allow me to determine if she just started off with a lower baseline or is she actively losing bone.

Dr. Bird: So, let's get into our next case. Cause I think this is where we really want to hear a little bit of the nuance over selecting a medication.

So, let's assume that we now have a patient who does score in the osteoporosis range based on their T score on their most recent DEXA. I think we can certainly talk about making a decision to use a T score versus a Z score and how you select for patients. But I think more globally, it's just helpful for us to know, like when you get that DEXA test back, what are you looking for? What's the first area that you look at, particularly if they have a T-score that's already in the osteoporosis range.

Dr. Mukaddam: So, I think just to quickly answer the question about the T score or the Z score. So, in post-menopausal women and men ages 50 or above, we're looking at the T score and not the Z score. And so the T-score is basically we're comparing our patients. Your patients are being compared to the average bone mineral density of like a 20 to 29 year old female. And we're saying, how does their bone density compare to what we consider as ideal bone mineral density? And so that's the T score. That's the number of standard deviations they're away from the average bone marrow density of a 20 year old white female. Versus the Z-score is we're comparing the bone density to the average bone mineral density of someone of their comparable age, comparable sex and comparable ethnicity. And we're saying, how do they compare to kind of a similar cohort to theirs?

And so we use this use the Z score for younger patients who are, you know, men below the age of 50 and pre-menopausal women to say if their bone mineral density is below, what is

expected for their age, or is it within what is expected for their age. Versus the T-score is what we use for diagnosis. And the cutoff is minus 2.5 or below to define someone as having osteoporosis and similar to probably all the other things that I talked about, it really depends on the patient. It depends on if the patient's had prior fractures. How low is the T score? What other comorbidities do they have? What concerns about side effects do they have. What allergies do they have?

So, I'm trying to think about multiple things when I'm trying to decide what's the best medication for this specific patient. So, in the past, everyone used to think of bisphosphonates as being the first line of therapy. But all the newer guidelines kind of put all the classes of medications that we have on the same line and can be considered as first-line therapy. The way I try to explain it to my patients is osteoporosis is due to an imbalance between the amount of bone being formed and the amount of bone being removed. And so we have medications that work by decreasing the amount of bone being removed or what we consider it antiresorptive agents. So, that would be the bisphosphonates, that would be Denosumab, which is Prolia. That would be estrogen. And then we have medications that I consider as osteo anabolic agents.

And those are medications that stimulate bone formation. And that would be like teriparatide or abaloparatide, which are given as a daily injection. And then more recently we have EVENITY, which is romosozumab. Which works as a medication to stimulate bone formation and also decreases the amount of bone being removed.

So, if I have a patient who has a very low T score, less than minus 3.5, or they've had multiple compression fractures, I'm usually starting with the osteo anabolic agents, meaning the daily injections, teriparatide or abaloparatide, or romosozumab, which is EVENITY. If someone is low risk, their T score's minus 2.7, they don't have any other risk factors, they've never broken any bones, I would start with an oral bisphosphonates and if they don't tolerate it, I might switch to an intravenous bisphosphonates.

Dr. Bird: Great. So, that's really helpful, Mona. What I would say is from my primary care practice, I think I'm almost always just thinking about bisphosphonates initially. So, that risk stratification is really a helpful way to think about this. I guess one question I have based on that is if we are getting somebody whose having, you know, a very severe osteoporosis on initial DEXA scan, is it right to think that this would not be an unreasonable time to get you involved to consult endocrine and to get your input on how to best manage these patients?

Dr. Mukaddam: So, I think in terms of who is able to manage patients with osteoporosis, definitely a specialist like myself who does osteoporosis, but even if there's a primary care doctor who really enjoys managing osteoporosis, is very comfortable ordering these medications, can manage that. But at any time when you feel like you're not comfortable with certain medications, you don't have enough knowledge of the side effects or when to use them, then that would definitely be a reasonable time to refer patients.

Anyone, I would say anyone who has a T-score less than minus 3.5, should be referred because we would probably order more extensive evaluation for secondary causes of osteoporosis. Anyone who is actively fracturing while on therapy, definitely should be referred to us. And anytime patients are not willing to take medications.

I mean, I get a lot of referrals for that one specific reason. And I see a lot of patients that have seen multiple doctors and they're coming to me as a third opinion or a fourth opinion for osteoporosis because they're just very reluctant to take medications. And so I think those are very reasonable patients to refer to me.

What I have found to be effective as well is what I try to explain to my patients is you have osteoporosis, these medications have been proven to work at decreasing your risk of fractures. At some point, I really only care that you're on an effective medication. And when you go see multiple doctors and multiple doctors are giving you different recommendations in terms of which medication to use, I try to bring it back and say, all four of us said you needed be on a medication. And that's the take home message. The take home message is you have osteoporosis, your risk of breaking a bone is very high. We all believe you need to be on a medication. We're all recommending a highly effective medication. Which medication they decide they want to take, can vary from one patient to the next, from their comorbidities, because of cost reasons, whatever the cause might be.

Dr. Bird: Yeah, I think that is a helpful perspective. I think for myself and I don't know how Rani feels about this, but the osteo anabolic agents, I think are probably out of my wheelhouse like agents where I think I'd always be consulting you, just because I think, you know, we're not as comfortable with prescribing those.

Dr. Nandiwada: So Mona, I think I really liked that perspective in terms of thinking about when to refer to you as a specialist versus what's in our wheelhouse. I'm with Amber, you know, alendronate is my favorite. I'm comfortable with it. I recommend it. I start patients on it. I think having those boundaries to say, you know, when am I, where am I comfortable might change how I have discussions with patients.

So if it's higher, you know, I might prep them about what discussion they may have with you thinking about these other agents versus what I'm more comfortable with. And so thinking about this further, I think some of the other places we want to talk about, you had brought up some of the other medications like Prolia. So trying to get your thoughts on preferences with Prolia and really in terms of that versus the bisphosphonates and would love to hear your perspective on that.

Dr. Mukaddam: Denosumab is also an anti-resorptive agent but it's not a bisphosphonate and it's in a completely different class than bisphosphonates, but it is also an anti-resorptive agent. And it's given as a subcutaneous injection every six months. And it does have to be given in an office setting. The data on denosumab is remarkable, it's highly effective. It can decrease your risk of having fractures in the spine and in the hip and in other locations, but my biggest concern with an denosumab is that it's a very reversible medication. So, once you start the medication, our patients need to get it every six months.

So, what I tell my patients in clinic, like if we're going to start denosumab, it's going to be a contract between you and me. And you have to make sure that you get your medication every six months. We know that if this medication is abruptly stopped, or if there's a delay of more than one month, patients start losing bone and there's rebound bone loss, and there's been case reports of patients developing multiple compression fractures in their spine during that time. So, it is very important that patients continue taking this medication every six months. The other concern with Prolia is that we don't know how to safely get patients off of it.

So, we don't recommend a drug holiday from Prolia. And so if we decide, we want to get someone off of Prolia, we do transition them to bisphosphonates, but we don't have the data to support that this will prevent the bone loss from happening completely. But we do that because we don't want them to have significant bone loss. And so we try to prevent that by giving bisphosphonates. The other thing about Prolia, is that once you're on Prolia, you cannot switch these patients to the daily injections or what we think of as osteo anabolic agents like teriparatide or abaloparatide.

There was one study that was done, where patients were given denosumab for two doses and then switched to teriparatide. And in the first six months they had significant bone loss. And so the preferred way is for us to start with an osteo anabolic agent like teriparatide, or abaloparatide and then if patients are continued to be at very high risk of fractures, we can then add on denosumab. denosumab is sometimes appealing in patients who have chronic kidney disease because it's not renally excreted. So, some of our patients that have impaired renal dysfunction, we do sometimes use Prolia for that reason.

Dr. Nandiwada: Love it. And you had brought up the drug holiday. So, just for my primary care heart, with the med that I'm so comfortable with, the alendronate, what are your thoughts on that drug holiday? Like I do after a while, you know, try to give them a break from it. And I know because right, theoretically it's absorbed in the bone and there's supposed to be slow release for a certain period of time with the mechanism of the biophosphonates. So, is this something that you routinely do? Should I be doing it? Should I stop giving them holidays? Although we all love holidays.

Dr. Mukaddam: Yeah, no, we all need a holiday, but we all come back from a holiday. So, those are the two most important points.

Dr. Nandiwada: Oh,

Dr. Mukaddam: So these are two very important points. But I think when the treatment of osteoporosis first came out and alendronate was first approved, it was thought of as being, you know, it's a chronic disease like hypertension, and you're going to give patients medications for the rest of their life. And then 10 years after alendronate was approved, there were all these case reports of stress fractures happening in these patients. Weird fractures that were unexplained, and that's what the concern for what we call atypical femur fracture, which is a stress fracture that can happen in the thigh bone.

And it's associated with prolonged use of bisphosphonates and coupling that with the fact that most of the studies that were done to demonstrate the efficacy of these drugs were three to five year studies. So, when you're balancing these two pieces of information, there's really very little data that continuing bisphosphonates beyond five years, it's going to be helpful for the patients.

And so the current recommendation is that you do bisphosphonates for five years. At five years, you assess, do you think these patients are still at very high risk of having fractures? Have they fractured while on therapy? Is their femoral neck t-score still less than minus 2.5. If you still feel at the end of the five years that they're at very high risk of having fractures, consider switching them to something more potent, you know, switching them to a teriparatide or abaloparatide or EVINITY or, you know, even Prolia or denosumab. Or rarely we don't like to do that, we can continue bisphosphonates for a maximum of 10 years, but no more than 10 years.

So, the recommendation is definitely do a drug holiday. The cutoff is usually at five years, when to restart it continues to be determined, but I would say they would require a drug holiday of at least two years up to four years, you would restart therapy if their bone mineral density significantly declines.

If they have a fracture, and I do check the markers of bone turnover. Specifically I like checking C-telopeptide, which is a marker of bone resorption, and it should be checked eight o'clock in the morning fasting. And if I see that this marker is starting to go up higher and higher, then I would say I want to re-initiate antiresorptive treatment at that point.

Dr. Bird: That's really helpful. And I will be honest. I was trying to not throw in C-telopeptide, cause I thought spend an entire podcast talking about that. But it sounds like this would be a good place to use it. So in, your holiday period, if you see it increasing, that may be a sign that you need to get your patients back on therapy. Great vacation's over. All right.

So, this has been wonderful. I think we've had a lot of really useful points. I know for my own practice, I'm just thinking about how moving forward, I am likely going to be taking a closer look at those T scores. And for patients who fall into that severe osteoporosis range, honestly, thinking about having a conversation about not just starting bisphosphonates and maybe even considering getting people into endocrine a little earlier to you know, think about these osteo anabolic agents. So, that is certainly my take home point. Rani any great learning points.

Dr. Nandiwada: I mean so many as we think about our practice. And I think the thoughts on the teriparatide and, you know, the osteo anabolic part of that is so important. And I'm also going to really try for you Mona, to not use osteopenia and do low bone mineral density from here on as I have conversations and not try to diagnose my patients with diseases they don't need. So thank you again for all of this

Dr. Mukaddam: Of course, ICD codes, you can put the osteopenia but you know, but, but as the when you're discussing with patients, I think I tried to refrain from using that term.

Dr. Bird: That's great. Well, thank you Mona. Thank you, Rani.

It has been great to have this discussion with you. Thank you all for listening in and hopefully we'll see you all on the next Penn Primary Care Podcast.