Health & Wellness Webinar: Promoting Bone Health - Falls, Osteoporosis, and Fracture Prevention

October 11, 2023

Transcript

[0:00 Introduction]

Dr. Anthony Levinson: Thank you so much, Christine. Welcome, everybody, this evening. And we are so fortunate to have my friend and colleague, Dr. Alex Papaioannou, Professor of Medicine, Geriatrician in the Division of Geriatric Medicine, Rheumatology and the Department of Health, Research, Methods, Evidence, and Impact here at McMaster University. Also, the Tier 1 Canada Research Chair in Geriatric Medicine and Healthy Aging, Executive Director of the GERAS Centre for Aging Research, and Chair of the Regional Geriatric Program Central.

Today, Alex is going to be talking to us about a hugely important topic around bone health, osteoporosis, and fracture prevention.

Take it away, Alex. It's great to have you here this evening.

[1:14 What are the current recommendations for exercise, nutrition, screening and medication for osteoporosis?]

Dr. Alex Papaioannou: Thank you, everybody, for spending your evening with us. Really excited to share with you the new guidelines. And, all righty. And can we see the slides? Perfect. All right. So tonight, we're going to be speaking on and really trying to respond to the many great questions on promoting bone health, falls, osteoporosis, and fracture prevention.

And in this picture, you can see bone health starts at a young age. We're trying to build our bone bank when we're younger to prevent those fractures. So, it is multigenerational. Just so people know, there's a number of sites that you can go to, including the Optimal Aging Portal, the GERAS Center, and Osteoporosis Canada.

Dr. Anthony Levinson: Alex, sorry to interrupt, I think you might have to stop and reshare because it's not showing the slides advancing.

Dr. Alex Papaioannou: Okay, how about now?

Dr. Anthony Levinson: Yeah, that's working.

Dr. Alex Papaioannou: Great. Sorry about that. Yesterday we had an exciting release of our new guidelines. I last was the lead author in 2010, and Dr. Suzanne Morin has led the 2023 guidelines that were just published, that are open and freely available.

And so, the clinical practice guidelines look at fracture risk, who should be screened, look at health promotion, exercise and nutrition, and medication. So, we'll be talking about all these opportunities. So, the new guidelines have an integrated approach, and really focus, and I'm going to talk to all of these. They focus on, for everybody, muscle and balance strength exercises at least twice a week.

So, a lot of folks think that walking is good for your bones, and it is, but what you really need is strength, which is resistance and balance exercises at least twice, if not three times a week.

Vitamins are fine, but you really should be getting your, ideally, your calcium, from fruits rich in calcium. And there's a nice calcium calculator on Osteoporosis Canada's website. The International Osteoporosis Foundation also has a nice calculator.

And dietary protein is really important, especially as you get older. And we'll talk more about that, how important the protein is in building the collagen in our bones.

Vitamin D, our new guidelines have focused on a lower dose. Often, we need supplements because of our latitude.

We'll talk again about the risk factors for osteoporosis, but in our new guidelines, important things are that anybody over the age of 40 should be screened if they've had a fracture. And really, those are the key changes in the frequency of screening for bone density.

[4:45 What is osteoporosis?]

Dr. Alex Papaioannou: So, what are bone basics? What are important things for everybody? Bone is a living tissue. It's a framework of protein that's hardened by calcium and other minerals. And I really like the analogy of the bridge. This is kind of that lacework that you see there is trabecular bone under the bridge. And that's the bone that we often see in the spine. In the hip, we see that cortical thicker bone, and the wrist has a mix of both.

Now, you can imagine if one of those lacey, under the bridge, if one of those lacey struts started to fall apart, the bridge could break easily. And that's what happens when we see spine fractures.

So, what is osteoporosis exactly? It comes from the ancient Greek word for porous bone. That's what osteoporosis means, and it means that it's low bone mass and the tissue is weaker.

So, you can imagine when you fall with that normal bone, and that's why we work with a lot of engineers at the University because a lot of osteoporosis is around mechanics of bone. That

normal bone, that normal bone when you fall, it doesn't break. The image you see, the osteoporotic bone, when those struts start being weak, you know a loud cough, or a hard cough, or a strong hug, or the wrong fall will break the wrist, for instance.

So, we often hear, well, it was icy, and I broke. Well, when you were 25, you didn't break a bone. But when you're older and those struts start getting weaker, especially say in women, women who tend to fracture their wrist, have that lacy bone after menopause. Men have stronger cortical bones at the wrist, so they tend not to fracture at the wrist.

So, what are typical osteoporotic sites where we fracture? Shoulders, the spine, the hip and the pelvis, and the wrist, the long bones. The head, the toes are not typical. So, often people will say, I've had these stress fractures in the foot. Those are not typical of osteoporotic fractures. They tend to be more in runners, people who march like the military, or sometimes when people have changes in their spine affecting how they walk or with arthritis.

So, what are warning signs of porous bone? Often there's none, but one of the first sign may be just a fracture.

But one of the significant warning signs is height loss. So, you can see this is not normal aging. And we often discuss this with medical residents, is I say, watching somebody walk into the room, they have thin legs and really a protuberant belly. Like you can see the individual on my right has got this bigger belly because the spine has fractured and compressed and shifted things forward.

So normally, you should be able to put three fingers between your ribs and your pelvis. When you can't, that may be a sign that you've had a spine fracture. Height loss, back pain, that protruding abdomen, often people who have spine fractures don't know they've had them. Most of my patients don't. They've been missed. They haven't been reported or mistaken for something else. This can really affect when your head's sitting forward, getting headaches, impact on your daily activities.

But most significantly is that the majority of patients with a hip fracture, over 40% have had a prior fracture after 40. And it's like a heart attack or a stroke. These people should have been initially treated to prevent the devastating consequences of a hip fracture. These can be prevented. Height loss is not normal aging. About 40% of people who lose height is due to osteoporosis.

[9:45 How do you assess for fracture risk?]

Dr. Alex Papaioannou: So how do we assess for fracture risk? You can go online yourselves and do your own FRAX. So, if you google FRAX Canada, this tool should pop up.

Now you can do this with a bone density or without. If you know your bone density, that's better because the bone density gives you more information. But you can do this to get a rough estimate how at-risk you are. And this will tell you if you have a score over 20 for major osteoporotic fracture or at a hip 3%, you really likely need medication.

But you can see the risk factors that we're worried about.

Have you had a prior fracture?
Did your parent have a hip fracture even into their 80s?
Are you smoking?
Are you on prednisone?
Do you have an inflammatory disease such as rheumatoid arthritis or one of the bowel diseases?
Are you taking more than three units of alcohol per day, or have secondary osteoporosis, from like diabetes, is a risk factor.

So, who should be tested? With our new guidelines, we have actually shifted from 65 to, say, everybody over the age of 70. So, this is an older slide. As of our new guidelines, it's everybody over 70. Between 65 and 70, if you have one clinical risk factor, of the ones I just mentioned, and between 40-65, it's really using the FRAX to see is this person at risk. And then have a bone density. And this applies to both men and women. We know men in this disease tend not to be treated as aggressively as women.

So, the FRAX is like a cholesterol test. You need the cholesterol. But we also, when we look at the cholesterol to predict your heart disease, we look at your family history, if you've had a heart attack or a stroke. The same with osteoporosis, we look at other risk factors that I just mentioned. And falls being one of them.

I should stress that the most important risk factors, if you've had a fracture in the past year, you are very high risk. So, just like a heart attack or a stroke, if you've had a heart attack or a stroke that first year is your highest risk time. Same with the fracture.

[12:45 What role do exercise and nutrition play in bone health?]

Dr. Alex Papaioannou: So, what are bone healthy lifestyle choices? Nutrition is really critical. Bone is a living tissue. We need to get calcium and protein to maintain healthy bones, as well as vitamin D. So, calcium is ideally from diet. Really, there has been no evidence that calcium from your diet actually decreases heart disease, not increases it. Vitamin D really ensures that you get enough calcium from your gut. It helps absorb the calcium. You need protein to establish and maintain the collagen and bone growth. Ideally, getting it from your diet. Like all medications, vitamins also can have side effects, and so trying to get it from your diet is ideal.

So, calcium, if you don't get enough from your diet, it's taken from your bones. We have four little glands behind your necks called parathyroid hormone. And if you're not getting enough calcium through your diet, it starts increasing and releasing it from your bones.

So, over 50, these are the Canadian guidelines for whether you have osteoporosis or not. We're really recommending 1,000 to 1,200 milligrams of calcium from your diet, but particularly for those over the age of 70.

So, this is just some highlights of some calcium-rich food. Use the osteoporosis calcium calculator. Many foods are fortified, and you'll look at the side of the food product, and it'll tell you how much milligrams of calcium you're getting, in say a cup.

If you can't get calcium from your diet, especially if you're on osteoporosis medications, we recommend up to one 500-milligram calcium supplement a day. So, the best calcium is either carbonate or citrate. They can be constipating. Speak to your pharmacist. They can be very helpful in guiding you because it can be quite confusing which product to use. We don't want you to over-consume calcium from supplements. It can be harmful if you take too much.

Vitamin D, there are a few natural sources of vitamin D. Most of it is obtained from the sun, and we know in our latitude that it is challenging. So, you can get it from diet or supplement. The new guidelines are not saying high vitamin D. They're saying about 800 IU for those over 70. I should add that if you're on an osteoporosis medication, it is really important to ensure that you're getting vitamin D and calcium because in all the research, everybody needed the calcium and D plus the medication.

So, what about exercise and movement? Really, across many diseases, not just osteoporosis, exercise, and I know you've had there has been a previous forum with Dr. Stu Philips, exercise really is medicine. And it is so important for the bones, for the mind, for your heart health.

And so, really key message, though, for osteoporosis, walking is not enough. We really important to look at balance, resistance, strength-training. And as you can see, some individuals will do it in a chair. If you don't have access to the internet, or you may be a type of person that likes joining places, like the YMCA in Hamilton, any of our regional programs, have a lot of 'bone healthy' programs. There's also physiotherapists and kinesiologists that are 'Bone Fit' trained. And you can google that and it'll tell you if your physiotherapist or your kinesiologist is 'Bone Fit' trained. So, they really will focus on your posture, your balance, and your strength, and resistance training. I can't stress this enough. It also reduces falls. So, in terms of, this is really critical that we start this in our 40s to reduce that risk of falling.

So really, the exercise is for balance. You want to challenge your balance. Tai Chi is also a great exercise. Standing on one foot, some people do it while brushing their teeth. Heel-to-toe stance is another one. Muscle strengthening is really the resistance. You need to do it at least twice a week. We know even for dementia prevention, it's really one of the keys. Weight training, exercise bands, you can use your own body weight. We have a number of videos called 'Too Fit to Fracture' that you can google on YouTube or Osteoporosis Canada.

[20:12 What are the medication options for the treatment of osteoporosis?]

Dr. Alex Papaioannou: What about medications? So, we've talked a bit about really key lifestyle, exercise. The Canadian guidelines say at least 150 minutes aerobics, combination where you're a little shorter breath, resistance and balance. We've talked about nutrition. We've talked about screening and knowing your family history, modifying smoking and alcohol. Now, what if you've had a fracture or you are at high risk?

So, the guidelines have shifted to really targeting those who are at high risk because we know that those are the individuals who most benefit from the medications. That sometimes the lifestyle factors are not enough. One in four women in Canada will have an osteoporotic fracture that can change their lives. I don't think any older adult wants to have a curved back that limits their activities. The other really important thing is that men, it's not uncommon, it's one in eight men, will have an osteoporotic fracture that could have been prevented.

Now, if you've had a fracture or you're deemed high risk, your physician may talk to you, or your nurse practitioner, or your pharmacist is an excellent also resource to look at treatment options. In Canada, due to cost and that these medications work, the options are a group of drugs called bisphosphonates. They're all generic in Canada, meaning that the cost is very low, but you may get a different product or you may see on your box a different name. So, it's alendronate, 70 milligrams, we don't all use the daily one, once a week. You need to take it with a full glass of water, wait an hour prior to eating, sit upright.

Risedronate is another drug in this class. It's 35 milligrams, same. There is a delayed-release form that you can take with food. We also have zoledronic acid that can be given intravenously once a year. These drugs, that one especially, can cause a flu-like feeling in a certain number of people.

All these drugs rarely can be associated with an ulcer in the jaw called osteonecrosis in the jaw, or rarely with an atypical fracture of the femur. They're rare. They're one to 100 out of 100,000. Especially, if you're not monitored, we generally are recommending these drugs be used for three to six years and then re-evaluated.

With the oral bisphosphonates, some people will have reflux and so this is not the ideal option for them. The other medications for women who are just undergoing or are at the stage of menopause and having hot flashes, hormone replacement may be an option. There are potential side effects, such as blood clots, stroke, heart disease, and breast cancer. So, really important to talk to your family doctor about this.

There is also a medication called denosumab, which is given by needle twice a year. And it's important with this medication that you have adequate calcium and D as rarely you can get a low calcium if you're not getting calcium and D. And this drug, as well, has the rare side effects of an ulcer in the jaw and also these atypical fractures.

Again, we know there's a lot of warning signs to side effects. It's not pain in the jaw. It's actual ulcer. And the people who haven't had good dental care are the most at risk or high alcohol intake.

Raloxifene, it's a selective estrogen receptor modulator, we use less often, but it is a treatment option.

Then there are for people with severe osteoporosis, who've had fractures, who've whose bone density is very low, just so you know, people will say, well, what's normal T-score? So, the bone

density, we want it to be that that's less than minus 2.5 at the spine or at the hip would cause a physician to think this individual may need treatment. For people with severe scores even lower at minus 3.5 or minus 3, we may look at a drug that actually builds those bones or builds that network.

The two drugs are teriparatide, and that's a daily injection for up to 24 months, and it can help with some of the vertebral fracture pain as well. And another drug, which is monthly, romosozumab, which is only for a year. So, these two drugs really build the bone, and then we go on to one of the other drugs, the antiresorptives, that we just reviewed.

What's really important to know about these medications is they can reduce the risk of a fracture by 40-70%. So, the hip fractures we're seeing, the spine fractures, really should be a thing of the past with especially high-risk individuals. Especially when you start going over the age of 70, and you're having fractures, or you're younger and you have those high risk numbers, we need to consider, in addition to the lifestyle modifications, medications.

So, I'd encourage you to also go to our website. We have some really exciting current studies that we're recruiting individuals. We have one study called 'Optimal Fitness' at the YMCA that looks at nutrition, exercise, medication. And you can see the individuals on the lower left-hand side are using nordic poles. So, we're looking at a very holistic approach to improve health. They go really hand in hand.

I'm going to stop sharing my slides, and I think we've left some time for questions.

Dr. Anthony Levinson: That's fantastic. Thank you so much, Alex. We've actually had a lot of questions come in. We had questions in advance as well. I'll go back and forth and try and stick with a few of the different themes.

So, one person writes in that they walk twice a week, they actually go to CrossFit three times a week, but still their osteopenia has not improved. Are they expecting too much? Is there a one-to-one relationship between some of the different exercises that you mentioned and osteopenia?

Dr. Alex Papaioannou: So, osteopenia, we're not using that word as much because you can have osteopenia, but if you have a strong family history or you're on high-risk meds, you may actually fracture with that bone density.

So, exercise we know can maintain bone mass. So, without your exercise, you may have lost more bone mass. But it may slow things down. It may not build bone mass.

Dr. Anthony Levinson: Okay.

Dr. Alex Papaioannou: And so that's why we know in younger children that it is really critical that thinking about that bone health in a young age. Your children, your grandchildren, thinking about building that bone bank with good nutrition and exercise.

Dr. Anthony Levinson: Well, I'll come back to that because there were a few questions about bone health and recommendations for children, which, I appreciate you're a geriatrician, but you know about bone health.

[28:05 How about if you have exercise intolerance or stamina issues that affect a person's physical activity?]

Dr. Anthony Levinson: Here's somebody who writes in that they've had long COVID and osteoporosis, so they have exercise intolerance, which has really restricted their physical activity. What would you recommend for someone in that category? You did highlight some of the chair exercises and things that might work well for people who have issues with their exercise tolerance or stamina.

If you had to recommend certain exercises that might fit the bill for people with that situation.

Dr. Alex Papaioannou: I think that that's really where a good physiotherapist who develops a tailored program for you may be invaluable. And recognizing that you can break up those exercise bursts throughout the day. It's a bit passé to do it all in an hour.

So, if your tolerance is low, you may do five in the morning, five in the afternoon, five in the evening and building up. But I really do think that there are, if that's not open to you in terms of physiotherapy coverage, is there are senior centers, McMaster has a wonderful Pace Program at the university as well, that can tailor that program for you.

Dr. Anthony Levinson: That's great advice. I think we probably underutilize physiotherapists because they're unfortunately not always covered, but even a couple of sessions to guide you on an exercise program. But I like your idea of breaking it up into smaller, shorter sessions throughout the day.

[29:55 How about the side effects, such as jaw pain, associated with Prolia?]

Dr. Anthony Levinson: There were quite a few people who have sent in questions related to concerns about Prolia. They've had partners or loved ones who have had osteonecrosis or the jawbone side effect that you mentioned, and they're just wondering about the safer options on the market or concerns about that side effect in particular.

Dr. Alex Papaioannou: So, I think that it's really important is that I see a lot of patients referred from primary care, they're worried or their dentists are worried that it's actually they have jaw pain, they might be osteonecrosis of the jaw. You actually need a CT of the jaw. Often, we'll start with an MRI, but you need a CAT scan as well to see if the bone actually has an ulcer in it. It's not just jaw pain. So, what we're finding is a lot of folks are misdiagnosed.

Dr. Anthony Levinson: Okay.

Dr. Alex Papaioannou: It could be also that the nerve is irritated as well.

Dr. Anthony Levinson: So, they may have just jaw pain related to dental pain, totally unrelated to the adverse effect?

Dr. Alex Papaioannou: That's right.

Dr. Anthony Levinson: Okay.

Dr. Alex Papaioannou: And the people that we're seeing with the ulcers of the jaw, they are there, but it's very rare. We often will see these side effects in people who have cancer. We use these drugs, say, and you see people are saying Prolia, which is denosumab, the trade name is Prolia, is they're often at much higher doses for cancer than we use for osteoporosis.

So, really dental hygiene is really important.

Dr. Anthony Levinson: Is there any effect of, there was somebody talking about the injections and whether or not there might be any effect on arthritis with the denosumab.

Dr. Alex Papaioannou: So, some people get a bit achy with their bones, but generally it's not been linked to arthritis, no. You may have some feeling the first couple of days.

[32:20 What are effective fall prevention strategies]

Dr. Anthony Levinson: Are there any, we didn't talk as much in the presentation about falls prevention, but one of the questions that came in advance talking about preventative strategies, were are there any drugs to avoid to prevent falls? And then also if you are traveling, are there strategies that might be helpful to prevent falls? I guess because you may be walking in unfamiliar areas or maybe encounter tripping hazards that you're not expecting.

Dr. Alex Papaioannou: Again, exercise, unfortunately, it's not a pill, but if you do 180 minutes a week of balance and resistance, you can reduce your falls risk by 20% to 30%, which is really profound. But it does require a commitment. And so many of our YMCA's or senior centers offer this kind of help. To give you an idea, the Otago program, you can google that, has some very good research around it. The Nordic poles that you saw for walking are really key.

The important thing around falls prevention is I tell my residents, is 'take off people's socks'. You have to look at the feet. So, your foot care becomes really important. You may need a podiatrist. Look at your shoes. Are you wearing down on the sides of the shoes?

As we get older, we have some arthritis changes in our spine. Some people have scoliosis and they've always been a little clumsy, and it gets worse with the wear and tear in our spine.

Look at the bottom of your shoes. You may need to change them every six months. So having good shoes that tie and support. In the hospital, we use now non-skid socks because a lot of our slippers are not adequate support.

Dr. Anthony Levinson: So, there's also many medications that can be associated with falls. Think about our antidepressants. Sometimes you need them, but they can be associated with falls. Sleeping pills, and sometimes people will take things like Gravol to help them to sleep, can be associated with falls.

And any of the pills that might lower your blood pressure if you stand up too quickly, that's another way that people fall sometimes too.

Dr. Alex Papaioannou: Thank you, Anthony, for that. That was, if you feel light-headed, when you go from a lying to a sitting position and you're on blood pressure pills, is get somebody to measure your blood pressure from lying. You need to be quietly resting for five minutes and then stand. So sometimes we find people who are traveling and taking their medications, are a little dehydrated and will feel light-headed. And so really important to have that checked and sometimes we'll order a continuous blood pressure monitoring cuff at home. So, you wear it for 24 hours and we get a better sense is your blood pressure being overly tightly controlled?

Dr. Anthony Levinson: You mentioned scoliosis before and one of the questions that came in was whether or not adolescents who might have idiopathic adolescent scoliosis or people who growing up, I guess, had some curvature of the spine or scoliosis. Is that a risk factor for later development of osteoporosis? This person had scoliosis as an adolescent and then was recently diagnosed with osteoporosis.

Dr. Alex Papaioannou: It's not necessarily a risk factor, but this is where I think that a really good 'Bone Fit' physiotherapist can help you work on strengthening your muscles that support the spine. Think of it like your own...People will put on belts, which weaken the muscles. Think about strengthening your own muscles, creating that girdle of support with your muscles, and that's really key.

With all the computer use we're using, we're finding that people who have scoliosis, their backs go into muscle spasm more often.

[37:20 What should children and young adults do to optimize their bone health?]

Dr. Anthony Levinson: Are there any specific recommendations for children? And are there some critical windows or particular ages where children can really build up bone health that will stand them in good stead later on in life? And just as a piggyback onto that, there was another question about how much calcium do children need?

Dr. Alex Papaioannou: I'd have to go back to the slides to take a look because this isn't the age group I usually deal with. They were on our minds in terms of the calcium. The calcium and vitamin D is what is recommended for everybody in general in Canada. And that's in the younger age groups, generally before 21 in women, around 25 in men, that's where really the resistance, that bouncing, the running, what we see that shear force on the bones is really

important in building your bone bank. And as well as having a good source of protein in your diet as well.

[38:38 What does the research say about collagen, protein, vitamin K, calcium and other foods or supplements for bone health?]

Dr. Anthony Levinson: Is there any evidence to support collagen in terms of bone health?

Dr. Alex Papaioannou: So, this is really, collagen, the research trials have been fairly nonconclusive in terms of preventing fractures. But we do know that from our studies that if you don't have enough protein in your diet, especially, we find that people cut out as they get older. You need 1-1.2 grams per kilogram as you get older. And especially, of protein. And you want to split it up between meals. And that's the best source of collagen for your bone and muscle. If you don't have healthy muscle, you won't have healthy bone. So, that is really your best source of protein.

Dr. Anthony Levinson: Somebody had a question about whether or not there was a role for prunes in promoting bone health. I wasn't familiar with that.

Dr. Alex Papaioannou: I don't know if prunes have any calcium or vitamin D. I'd have to look that up.

Dr. Anthony Levinson: Yeah, I don't think they're super high in protein either.

Dr. Alex Papaioannou: They can get constipated with calcium. That may help.

Dr. Anthony Levinson: That's true. Is there a role for vitamin K supplementation with respect to bone health?

Dr. Alex Papaioannou: Yeah, we know vitamin K can be really important when it comes to green leafy. Dr. Angela Cheung at the University of Toronto did a study, and there is an improvement in bone density maintenance, but no reduction in fracture. So it's important in overall bone health, but doesn't reduce your fractures. So, your green leafy vegetables are a good source.

Dr. Anthony Levinson: A couple of other calcium questions. Is the calcium that comes from dairy products the same as foods such as almond milk or calcium-fortified orange juice?

Dr. Alex Papaioannou: Most of them are calcium carbonate, so yes, they're very similar. But any variety of calcium from all sources, many of our Mediterranean, Middle Eastern may be lactose intolerant.

Dr. Anthony Levinson: Is it recommended that if you are taking a calcium supplement, that you also have magnesium?

Dr. Alex Papaioannou: So, it's often helpful because you get less bloating and constipation if it has magnesium. And it is an element that we have in bones. And I see somebody's asked, 'What do you mean by you need healthy muscle to have healthy bone?'. What we're increasingly finding, like our research at McMaster, is we find people who have sarcopenia, which is the difficulty getting out of chairs, the weak leg muscles, their bones are not as healthy. They tend to have a greater risk for osteoporosis. So, that pulling of the muscle and the bone is doing something.

Dr. Anthony Levinson: There's a couple of questions about crushed eggshells. There was one person saying a physiotherapist had recommended that, and somebody else has put that as a question as well. Any thoughts on that?

Dr. Alex Papaioannou: It's not my first source I would go to.

Dr. Anthony Levinson: I feel like... And here's something, “What about bone-derived calcium that can be purchased in capsules?”.

Dr. Alex Papaioannou: Yeah, I mean, you can look at all those. You just really need to know with your pharmacist. I would go over with how much of it is bioavailable. Some of these are like we used for a while. There was a run on calcium from coral. And what they found was it was quite contaminated because coral is in the oceans. So, my best advice would be with these products is really review it with your pharmacists who are experts often on how much of this is bioavailable. The calcium carbonate and citrate tend to be more bioavailable. Some people are intolerant to them.

Dr. Anthony Levinson: The person who had posted the question about the prunes had a quick follow-up saying it's not that they're apparently high in calcium or other minerals, but at a conference that they recently attended, there was a study that showed improvement in bone density with five prunes a day. But it doesn't, I don't know what
the mechanism would be for that.

Dr. Alex Papaioannou: I don't know either, and I'll have to pull that one up. Thank you. I've always learning from my patients.

Dr. Anthony Levinson: Do you have any recommendations or suggestions or information for people who might be interested in participating in studies?

Dr. Alex Papaioannou: For sure.We have at MIRA, the McMaster Institute for Research on Aging, on their website it'll go through all the current studies. The GERAS Center as well. We list studies that you can enroll in. So those would be both good options. And we value participants in our studies.This is where we're changing the face of science as we speak with these studies. And certainly, McMaster is really a leading university internationally for osteoporosis and many other challenges as we age.

[44:54 Is there a role for hormone replacement, or estrogen therapy, for bone health?]

Dr. Anthony Levinson: Could you say a bit more regarding estrogen therapy for bone strength for postmenopausal women?

Dr. Alex Papaioannou: So, estrogen therapy, we know that estrogen is critical in bone health. And as at the time of menopause, that's when some of the women, the one in four women, will lose estrogen and lose bone really rapidly. And that option for women that are having still hot flushes at the time of menopause, are having a challenge, estrogen will definitely reduce your risk of fractures.

And so, at the primary care level, or your OB-GYN, can review with you the pros and cons of estrogen. Some women feel their quality of life is much better. So always being informed, knowing the benefits and potential risks.

Dr. Anthony Levinson: I feel like that's such an important and hot topic that maybe we should devote a future webinar just to hormone replacement therapy because I think the science on it has been a bit confusing for people over the past decade.

Dr. Alex Papaioannou: I think there's a lot of interest in whether you have the equine, which was the more traditional one, or the more natural estrogen. I think that that would be a wonderful webinar to consider.

[46:20 Should you use a rollator walker to prevent future falls?]

Dr. Anthony Levinson: Another question that came in was, “Is it a good idea to use a rollator walker to help prevent future falls?”.

Dr. Alex Papaioannou: So, we really have no direct research that a rollator walker prevents falls, but certainly, many physicians will recommend, and physiotherapists and occupational therapists, if someone is unbalanced or having challenges, to use a walker. But that really is in addition to balance training.

So, really important that, what I find is, some of my patients will go to a walker and not continue with their balance and resistance and keeping up their strength. So, what's important is the walker should be assessed properly because I've seen a lot of people buy them at garage sales or have a parent's in the garage that they're using, or a friend's. Make sure it's assessed properly for you. It can make a world of difference in terms of being able to get out during the winter months. There's newer versions that are quite light. Places like Dell Pharmacy, Shoppers. The Government gives you a rebate on some of these.

[47:50 What tests will your healthcare provider do to assess your risk of fractures and bone health?]

Dr. Anthony Levinson: There's a few questions that have come in, just asking for some clarification around what types of tests and I guess when. Let's say you had concerns about your bone health or you wanted to get a baseline, is that something that would be done routinely? Would you check with your primary care provider? Would they order tests if it weren't indicated? Maybe you can just cover off a few of those things.

Dr. Alex Papaioannou: You know, 10 years ago, a lot of individuals were getting them in their 50s or at the time of menopause. We've shifted from that. And we're now saying everybody over 70 should get one at some point. If you're between 60-70, if you have one or more risk factors, and between 50-65 if you have a strong family history, you've been on prednisone, or you're on high-risk medication, go back to that FRAX and see how many of these risk factors. If I have a number of them, then it would be warranted.

We also will often do blood tests. We'll check people's thyroids. Especially, if there's a spine fracture, we'll go on and check PSA. We used to do heel ultrasounds. We're really finding it's a screening test. It's not used as often. Often, sometimes people get a chest X-ray, and the radiologist will say, "Oh, your bones look osteopenic." And we'll go on to do a bone density.

Dr. Anthony Levinson: There was another question that came in. "Does bone density tell the whole story, or are there other types of variations, say, in the quality of the bone matrix or the structure that wouldn't necessarily get picked up by a bone density scan?"

Dr. Alex Papaioannou: Yeah, so it doesn't tell the whole story. So, some of our hospitals will have an arm on the bone density machine that actually measures all your spine vertebrae to see if there's a silent fracture. Or some people will have back pain that's missed that it was a fracture, for instance. The quality of the bone were not as good. We know we can measure it with MRI. We do that with research. So, the quality of the bone is, sometimes we only know, is when people have a fracture.

This is why we use the other risk factors that I mentioned. The alcohol. Are you on high-risk medications? Are you falling? Because that may also indicate something around the quality of your bone.

Dr. Anthony Levinson: When we talked about medications that put people at risk for falls, we weren't thinking about one of the biggest drugs that does that, which is alcohol. I would say many of the people that you and I see in hospital with recurrent falls, alcohol is one of the culprits. And so the combination of osteoporosis, falls, and often other neurologic issues, so alcohol is a bad combination with osteoporosis in terms of falls and fractures as well.

Dr. Alex Papaioannou: So, your home is like, we all have things that put us at higher risk for falling and so really looking at your home. Where is their clutter? Is there scatter mats? That's also important. There's great checklist that you can get on the Optimal Aging Portal. I know many people, now I'm seeing people in their 60s, 70s who have parents 90-100. So, I know

many people are caregivers themselves. So, printing off one of these lists is important in just doing the screen yourself.

[51:45 Why is the first year after a fracture the highest-risk period for refracture?]

Dr. Anthony Levinson: So, we probably only have time for a couple more questions. One of the ones that came in, "Can you say more about the first year after a fracture being the highest risk for another fracture? Why is that? And is the fracture risk anywhere in the body or the same spot where you had the initial fracture?"

Dr. Alex Papaioannou: So, it can be anywhere. It predicts other sites. And we're not totally sure on what the mechanism is. Is it that the structure is unstable, say, in the spine, you have a higher risk getting another spine fracture. Is there a higher bone turnover because of that fracture? Those may be all part of the mechanisms. You're not moving as much. We know that people lose bone very quickly when they are admitted to hospital. There's a high bone loss, even just a couple of days in bed.

Dr. Anthony Levinson: That's great. I'm going to finish up here. Thanks, everybody, so much for the questions that have come in. I'd like to finish off by showing a few of the resources that, Alex, you mentioned. So, this is a screenshot from the home page of Osteoporosis Canada's website, which is a great resource. It's just osteoporosis.ca. The new clinical practice guideline is there, the calcium calculator. This is a screenshot from their calcium calculator on the site. They also have the link to the FRAX fracture risk assessment tool that you mentioned. So, all of that can be found through the Osteoporosis Canada site. I also, for those of you participating through Zoom, put in the exercise recommendations and the 'Too Fit to Fracture' videos and handouts can also be accessed through osteoporosis.ca.

Do you want to say a bit about GERAS? You mentioned a little bit about the GERAS Center, but anything else you want to say about that?

Dr. Alex Papaioannou: Sure. We have information on muscle, bone, frailty, and falls, as well as brain health. So, lots of good information that's complementary. And in the top of the site, at the GERAS Center site, which you can google it, it has active studies as well. There are research studies if people want to get involved as well.

Dr. Anthony Levinson: Just very quickly, on the McMaster Optimal Aging Portal, I think many of you are familiar with it, but mcmasteroptimalaging. A whole series of different types of content, as well as the ability to sign up for weekly email alerts where you get new content added in the form of Blog Posts. There's also videos on the site, as well as e-learning lessons, including our new series on dementia risk reduction.

These webinars are recorded and available through the Portal's YouTube channel as well as the Alumni Association's YouTube channel. And there were a few folks who seem to have some trouble following some of the slides today, so we'll send out a follow-up email with a link to the recording in a couple of days.

And as I mentioned, our new series on dementia risk reduction, including an e-learning lesson on what you can do to reduce your risk of dementia.