Program Title: Common Questions About Bone Health and Cancer

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Moderator: Robin Perlmutter, LMSW- Support Connection Peer Counselor

Guest Speaker: Dr. Payal Sahni, MPT, DPT, Senior Physical Therapist at Helen Hayes Hospital and Program Coordinator for the NYS Osteoporosis Prevention and Education Program.

Dr. Sahni holds Masters and Doctoral degrees in Physical Therapy, and is an Ambassador for Bone Health Education for the National Osteoporosis Foundation. With 20 years of experience as a PT, Dr. Sahni has spent the past 12 years at Helen Hayes Hospital, which serves as the Statewide Osteoporosis Resource Center for the NYS Osteoporosis Prevention and Education Program. At Helen Hayes, Dr. Sahni developed a program called "Strong Bones, Stronger Me." She has also engaged in research pertaining to PT for osteoporosis, and is a frequent speaker at seminars and educational programs on bone health.

Program Description:

This educational webinar addresses some of the common questions pertaining to bone health for those diagnosed with breast, ovarian or gynecological cancer, such as:

- What are bones made of?
- What are the effects of cancer treatments on bone health?
- How common is osteoporosis among survivors of breast, ovarian and gynecological cancer?
- What are some of the risk factors for osteoporosis?
- How is osteoporosis diagnosed?
- Are there steps I can take (such as exercise, nutrition, supplements) to enhance my bone health?

NOTE: You may find it helpful to view and listen to the slides from this webinar (which are posted on our website and YouTube channel) while reading through this transcript.

Robin Perlmutter: Good afternoon, everyone. My name is Robin Perlmutter. I'm a peer counselor here at Support Connection. I'd like to welcome you to our nationwide webinar on bone health and cancer with Dr. Payal Sahni. Remember that Dr. Sahni is sharing her expertise, and any information from today or questions pertaining to individual concerns should be discussed with your doctors.

It's with my great pleasure that we have Dr. Payal Sahni. She is a Master's of Physical Therapy, Doctorate of Physical Therapy and a Senior Physical Therapist at Helen Hayes Hospital in Rockland County, New York. She is also a program coordinator for the New York State Osteoporosis Prevention & Education Program. With 20 years' experience as a physical therapist, Dr. Sahni has spent the past 12 years at Helen Hayes Hospital, which serves as the statewide osteoporosis resource center for the New York State Osteoporosis Prevention & Education Program. At Helen Hayes, Dr. Sahni has developed a program called Strong Bones, Stronger Me. She is also engaged in research pertaining to physical therapy for osteoporosis and is a frequent speaker at seminars on the topic.

Thank you, Dr. Sahni, for sharing your expertise with us this afternoon.

Payal Sahni: Thank you so much. I welcome everybody. And thank you, Robin, for this terrific introduction. I'm humbled.

And as Robin stated that I am here to represent the New York State Osteoporosis Prevention & Education Program. And just to give a really brief description before we move on is that the mission of NYSOPEP, the New York State Osteoporosis Prevention & Education Program, is to educate the people of New York State and beyond about various aspects of bone health, ranging right from medications to exercise, nutrition, lifestyle change, et cetera. And that's what brings me here today, and I thank all of you for taking the time to attend the talk.

So without further ado, let's start the presentation. So we're going to be addressing some common questions about bone health and cancer. How cancer affects bone health and what can you do to improve your bone health for good bone health. I just had a disclosure slide that I don't have any financial benefits from this presentation. And the objectives, some of the objectives or my questions that I would like to address through this presentation are stated here. These are some of the questions as to what is bone made of? How common is osteoporosis, and which individuals are at risk? How is bone health affected by cancer treatments, which is going to be the main discussion today. And how is osteoporosis diagnosed? What is the right way to exercise for good bone health? And what is the correct nutrition for good bone health? These are some of the basic questions that I will try to address in this presentation today. Next slide, please.

Moving on to our first question, talking about bone. What is exactly bone? So as you can see in this little picture here, calcium and phosphate make about 60% of our bone. And the rest, 40%, is composed of protein and water. So if you look at this little schema of the bone, calcium, phosphate, protein and water, all of these are the essential building blocks of your bone. So, taking these building blocks of calcium, water, phosphate, protein, we make up what we call as a bone bank.

So it's very important for us to understand that bone is a living and growing tissue. It lives and grows throughout our lifespan. From about 19 to 25 years of age, there is a positive balance in this bone growth, which means that that's the time when we are developing bone. That's the time when our bones are getting thicker and denser. At the age of 25 is when most individuals achieve their peak bone density. That means they have the maximum bone density that they can achieve in their lifespan is around the age of 25 years of age.

So between -- I'm sorry, I said 19 to 25. It's 9 to 25. I'm sorry. It's not 19 to 25. 9 to 25 years of age is the time when we are building bone and we are laying more bone, where the rate of bone growth is more than the rate of born resorption. As I said before, bone is a living and growing tissue. So constantly, bone cells are being formed and resorbed in the body. But from 9 to 25 years of age, there's a positive balance. That means your bone is being -- it grows faster than it's being resorbed. And that's how we lay new bone.

After the age of 25, when an individual -- or around the age of 25, when an individual has gained their peak bone density, that's when the problem starts, to say the least. That means at that time, it is very important for us to maintain an equation between the rate of bone growth and rate of bone resorption. As long as bone growth and bone resorption are equal, there will be no loss of bone. But when there is an imbalance in this bone formation and bone resorption, that's when the condition called as osteoporosis, or low bone mass, arises. So an imbalance in this equation of bone growth or bone formation and bone resorption will lead to low bone mass.

Now why does calcium gets taken away from the bone? That's another important issue to understand. Calcium is a very important element for our bodily functions. So what also plays into this equation is that if your body is not getting enough calcium from your nutrition, it's going to draw it from your bones, from your skeleton to meet its bodily functions. Calcium in your body is required for normal heart function, normal muscle function, normal kidney function. And if you're deficient in calcium from outside through your nutrition, your body is going to draw it from your bones because it knows that there is a bone bank in the body or a calcium bank in the body. So that calcium gets drawn. So it's very important for us to maintain this equation of putting enough calcium in your body so that this calcium is not lost from your skeleton to achieve these bodily functions that are very important for your living.

So that's -- when there is an imbalance, as I was speaking, that when there is an imbalance in bone formation and bone resorption, that's when a condition called osteoporosis arises. And here are some definitions of osteoporosis, that the bone -- this is a disease that causes bones to become thin, weak, and bones can fracture or break easily. Of course, osteoporosis is a silent disease. You cannot feel or see your bones getting thinner and weaker. The areas that are most commonly affected by osteoporosis or osteopenia are your lower back, hips and your wrists. Although it affects the entire skeleton, but these are the areas where you can see the effect of loss of bone the most: your lower back or lumbar spine, your hips and your wrist joints.

Let's talk about how common is osteoporosis. About 54 million Americans have osteoporosis. And because they have osteoporosis, they have an increased risk of fractures or breaking their bone. Osteoporosis is more common in women than in men. 1 in 2 women and 1 in 4 men over the age of 50 can have osteoporosis or can have an incidence of a fracture. There are certain factors and certain comorbid conditions that can increase the risk of osteoporosis for various reasons, and I've made a list of these conditions based on their severity. And the top of the list is cancers. Breast cancer, ovarian cancer, cervical cancer, prostate cancer, testicular cancer, multiple myeloma and many other metastatic cancers increase your risk of developing low bone mass or osteoporosis. And other conditions on the list are multiple sclerosis, celiac disease, long-term use of thyroid and steroid medications, rheumatoid arthritis and diabetes, just to name a few.

So here is a list of some of the general risk factors. These apply to everybody, irrespective of other comorbid conditions. These are general risk factors for osteoporosis. And these include women older than 65 and men over 70 years have increased -- have shown to have increased rate of bone loss: people of Caucasian or Asian descent have an increased risk for developing osteoporosis; early menopause; a family history of osteoporosis or fracture. If you have a fracture above the age of 50, you're automatically at a high risk for developing osteoporosis. And if you have lost about 1.5 inches of height over a period of time from your maximum height, then you are at a greater risk for osteoporosis. Lack of exercise, lack of physical activity will put you at a risk for osteoporosis. Smoking and alcohol also puts you at a risk for osteoporosis.

Since we are talking about bone health in cancers, let's look at some data that we recently received from the New York State Cancer Registry and see how common are these gynecological cancers. And the first one on the list is breast cancer, which is the most commonly diagnosed cancer and the second leading cause of cancer deaths among women in New York State. Now this data, as I said, is received from New York State Cancer Registry, and this data on breast cancer is from women ranging from 50 to 74 years of age.

I also want to make a point here that I am presenting this data specific to New York State in the first and the second point. However, National Osteoporosis Foundation has just come out, they have just put out a recent data on nationwide osteoporosis prevalence. And if you're interested, you can go on NOF.org, National Osteoporosis Foundation dot org, and you can search for data. They've divided the data based on states as to see how prevalent it has been recently.

So going back to our data, each year, approximately 15,750 women in New York State are newly diagnosed with breast cancer, and approximately 2,550 die from the disease. Approximately 840 cases of cervical cancer are diagnosed each year, and nearly 280 women die from the disease annually in the state of New York. This is also data from New York State Cancer Registry, and this is from women ranging from 21 to 65 years of age. And then the last bullet point I have there is a national data, and that was received from National Cancer Institute, which says that about 1.2% of all newly diagnosed cancer cases in the United States were those of ovarian cancer in the year 2020.

So these are some of the recent data that we've received, and as I said, if you are curious to check out other statewide data, you could go on NOF.org. They've recently put out this data based on states.

Let's talk a little bit about cancer treatments and osteoporosis, because cancer treatments do affect bone. They do affect the density of bone and, hence, they put people at an increased risk of osteoporosis. And some of the common medications that are used for treatment of cancer are aromatase inhibitors. For example, Arimidex, Femara, Aromasin, all of these medications do increase your risk of osteoporosis. Some chemotherapy medications increase your risk for osteoporosis. Immunosuppressive medications like methotrexate put you at a higher risk for medication -- for osteoporosis. Androgen-deprivative therapy, or ADT, increases your risk for osteoporosis. And steroid medications like prednisone and cortisone also increase your risk for osteoporosis.

Now it's very important for you as a patient to discuss these concerns with your doctor when these medications -- these medications do outweigh -- their benefits do outweigh the risk of osteoporosis, but that doesn't mean that bone health should be ignored. So it's a really important discussion to bring up with your doctor, with your specialist and see how your bone health is while you're on these medications for a long time. Next slide, please.

So once we start the discussion about bone health and cancer treatments, let's talk a little about who actually treats osteoporosis. Now, treating people with osteoporosis, or any other diagnosis, in my clinical experience has taught me that it is very important to choose a healthcare provider who is knowledgeable about the diagnosis and management of osteoporosis. A variety of healthcare providers can treat osteoporosis. There is no one specialist who is the only one who can treat osteoporosis. There's a variety of clinicians who can treat osteoporosis. But when as a patient you're trying to find a clinician, it is important that you choose a healthcare provider who is -- who treats osteoporosis, who's knowledgeable about the condition and who understands how to diagnose it and how to treat it, because that's very important for you, like any other diagnosis.

But the top of the list would be an endocrinologist. And endocrinologists are -- the endocrinologists are the specialists who treat osteoporosis. Rheumatologists treat osteoporosis. Gynecologists treat them -- treat osteoporosis. Physiatrists treat osteoporosis. And primary care physicians also treat

osteoporosis. All these clinicians are capable of treating osteoporosis. It's just that how much of an experience they have had with that particular diagnosis is what you should be looking at as a patient. Next slide, please.

And once you have determined the clinician that you are going to see or consult for osteoporosis diagnosis, you also should know, well, how is it diagnosed? And there's a battery of tests that is done. Some of them are physical tests, some of them are investigations, which I'm going to go over all of these, and some of them are blood tests.

So it's a combination of tests that are done which will give you -- which help your clinician to decide that you really have a diagnosis of osteoporosis. And these start with a physical exam and a yearly height measurement. And we talked a few slides ago about risk factors for osteoporosis, and we said that if you've lost about more than 1.5 inches of height from your peak height, you're at an increased risk for osteoporosis. And that sometimes is the only thing that prompts further investigations. And one of the most important things that prompts further investigation is to look into your bone health. So, physical exam for me makes the top of the list. And of course your risk assessment. So your clinician is going to look at the risk factors and see where you fall and how many risk factors do you carry.

And then based on that, they can send you for a bone mineral density testing, which is the most common test to determine your bone density and is most often done. Anyone over the age of 60 is eligible for a bone mineral density test. Most insurances cover it every two years as a normal routine test. If you have not had one and you're over the age of 60, you must have that discussion with your doctor, with your primary care physician to send you for a bone density testing because it's a part of your routine examination every other year. In fact, if your doctor thinks it's necessary, they can sometimes send you for a BMD test every year. If you are on a medication, they want to track your bone density, it's up to your doctor. They can even send you for a bone mineral density testing every year. But as a routine test, it is done every other year, every two years.

Another important tool that is used to assess bone density is the FRAX tool. And FRAX tool is a tool that calculates your probability of developing a hip fracture over the next 10 years. So most often, bone mineral density testing and FRAX tool are used in combination to actually kind of calculate your risk of developing a fracture. So it's an important tool in the diagnosis of osteoporosis as well.

Similarly, vertebral fracture assessment, or a VFA assessment, you can call it in simple terms as a focused x-ray of your vertebral column. So for example, lumbar spine is what we are looking at. It also -- your clinician is going to correlate it with your presentation. If you say I have back pain, or if they find on a BMD test that a particular level of your spine, a vertebral body in your spine has more loss of bone than the other, so vertebral fracture assessment is a focused x-ray of that part of your spine to see if you currently have a fracture. So it really is an x-ray, but it's focused on a certain level of your spine, of your vertebral column to determine if you have a fracture.

As far as radiation is concerned, it's a very safe -- a very, very safe test. In fact, both the BMD test and VFA, bone mineral density and vertebral fracture assessment test, both have radiation less than a normal chest x-ray. So they are very safe tests.

Some other investigations that are utilized to determine if you have osteoporosis are -- is a blood test in which they look at biochemical markers. That means they look at markers of bone formation and bone resorption and see how the balance is, the balance that we talked about earlier. There

has to be a balance in your body between how much of bone is being formed and how much of bone is being resorbed -- is resolved as a normal bone cell cycle. So if there is an imbalance in that, there are biochemical markers that can determine that in your blood. So that's a blood test for biochemical markers to determine if bone metabolism is correct in your body or is in balance. And then they also look at your blood calcium and vitamin D levels to determine your bone health. So these are some of the most important tools that your clinician is going to utilize to determine if you have osteoporosis.

And then there are some questions, as I always tell -- whether I'm talking in a seminar like this or I'm talking to my patients, I always tell them that you have to do your homework before you go to see the doctor. So you should know to ask the right questions. So here's a list of some of the questions that can be very important for you to know. These are some things that always come to mind, oftentimes after you have seen the doctor.

So here's a list here. What is my personal risk for osteoporosis? When is the right time for me to get a bone mineral density test? Is a bone mineral density test covered by my insurance? These are some really common questions, but important questions for you to know and for you to ask your clinician. Is a BMD test painful? A lot of these questions I've already answered so far for you, but these are some things that you really should keep in mind. How do I prepare for a BMD test, and what is it? How do I prepare for it? Is it painful? How will I understand my test results? Are you going to call me or should I call you? Should I follow up? How will I know what my results are? And how often do I have to get a BMD test? So these are some really important questions that you must ask your provider when you go to see them for a BMD test. Next slide, please.

And here I have a simplified how a BMD test looks. On the right side, you can see this picture of a woman, and she's getting a bone mineral density. It really is a scan. You see that the white scanner that goes on top of the body, it goes from top to bottom, scans your skeleton and gives us focused images of your lumbar spine, your hips. If your clinician has asked for wrists, it'll give us wrist findings also. And that's how a VFA (vertebral fracture assessment) is also done. So it's a very simple test. It does not take more than 10 to 15 minutes, and it's pain free.

And on the left you see a graph that shows you the results, how to read the results. Normal bone density is considered 1. So the reading 1 says your bone density is normal. Anything less than 1, when it goes into negatives, shows you loss of bone. So any number between minus 1 to minus 2.5 is osteopenia. And anything greater than minus 2.5 is osteoporosis. So a simple thing for us to know or for you to know as a client, as a consumer, as a patient is that anything less than 1, any number in negative is showing you bone loss, whether it's osteopenia or osteoporosis.

In fact, a lot of people say, "I only have osteopenia and I don't have to be too worried. It's mild bone loss. It's moderate bone loss." But you will be surprised that most incidences of fractures occur in osteopenia than osteoporosis. It's very bizarre, but studies have shown that people with osteopenia are at a greater risk for fractures as compared to people with osteoporosis for some strange reason. My personal take on it is that people with osteopenia do not take the condition that seriously, and they can have an accelerated bone loss because they don't take care of their bones as much. That's what I have seen. But there are studies to back this up, too. And people with osteopenia are at a greater risk of developing fractures, and they in fact actually more numbers of people with osteopenia develop fractures as compared to those with osteoporosis. Next slide, please.

So once you've received a diagnosis of osteoporosis, how do we treat it? Three main pillars of osteoporosis treatment are medications, exercise and nutrition. And if you need medications, you need medications. Sometimes lifestyle changes are not enough. Next slide, please. So at that time, it is very important for you to have that discussion with your doctor and find out more information about FDA approved medications. And medications are determined -- or to determine which medication's going to be the best for you. Your doctor's going to look at your bone mineral density, your medical history, your risk factors, other comorbid conditions, other medications that you're taking and how bone density medications are going to interact with your body and other mediations that you might be taking. So these are discussions that are very important. And sometimes, as I said, lifestyle changes may not be enough. If you need medication, you need medication.

In my experience -- I'm just going to share this. In my experience in treating patients with osteoporosis, nobody wants to take medication. And I would do the same. I would like to try everything that is other than medication. I would like to try lifestyle changes and nutrition before I would jump on a medication. And that's totally okay. And that's what I see most of the time. But also, you have to keep in mind that when you need it, you need it. So it's a very important discussion and a very important decision for you to reach. And I do encourage all my patients and everybody I see for bone health to make sure that you have really determined that you don't need medication if you're denying it. So it's always good for you to get a second opinion, a third opinion just to make sure that every clinician is pointing you towards the same direction. Then if you need that medication, you need that medication. And there are many medications out there that treat osteoporosis, and you can have that discussion with your doctor to find out which would be the best one for you to use.

But don't forget lifestyle changes. Mediations are not going to help without lifestyle changes. For these medications, for the osteoporosis medications to work, exercise, activity, nutrition are equally important. So it's a balance between your medications, lifestyle changes, nutrition and medication. All of them are required. Even if you're taking the medications, you have to have your lifestyle changes to make sure that these medications are giving you the maximum benefit they are designed to provide to your skeleton. Next slide, please.

And this is one of my favorite slides. And here I try to explain that how physical activity and balance affect osteoporosis and how they are -- and how osteoporosis affect physical activity imbalance. So it's a two-way thing. Physical activity and balance affect osteoporosis and are also affected by osteoporosis. So let me try to explain this to you in a cycle of events that I've put up here.

So if we look at point number one, when you receive a diagnosis of osteoporosis, you are aware that you have fragility in your bones, your risk of fracture is high. And in simple terms, you think that if you move the wrong way, you're going to break a bone. And that's a very common feeling in people with osteoporosis. And I think that's where this whole cycle of physical activity, balance and osteoporosis starts. So when you receive a diagnosis, you know you are at a greater risk, and that's what develops a fear of falls and injury in an individual who receives a diagnosis of osteoporosis. And oftentimes, doctors do tell their patients when they give them a diagnosis of osteoporosis, "Try not to fall, Mrs. Smith, because if you fall, you're going to break a bone." And I think that that's what instills or kind of begets the fear of falls and injury even more.

Oftentimes people come to us saying, "I don't know how to move. I am afraid to go to the gym,

because I feel like if I go to the gym, I'm going to break a bone. If I move the wrong way, I'm going to break a bone." And it's a very valid concern, and this is something that we have to address. But it is also one of my concerns that it increases inactivity because of fear of falling and fear of injury. So because you are afraid to move, you turn grossly inactive, and this inactivity leads to lack of flexibility, further leads to lack of muscle strength and mass because now you're not moving enough. And lack of muscle strength and mass further leads into balance deficit. It increases your balance deficit. And once your balance is affected, the risk of fracture goes high again. So it becomes a revolving door for you.

So that's how I -- it's very important for us to break the cycle. Break the cycle of fear of movement. Learn how to move the right way. Learn the right kind of exercises and get moving, because that's what's going to help your bones. Even if you're on medication, that medication is not going to work unless you include physical activity in your recovery. Next slide, please.

So when we talk about exercise and physical activity, there are some questions that are most commonly asked as to what type of exercise should I be doing? How often should I be doing this exercise? For how long should my exercise session be? And how intense should my exercise be? How hard should my exercise be? So these are some common exercise questions and very valid and valuable questions. And my next slide, in my next slide, I've tried to answer these questions. And these are some of the guidelines that have been provided by American College of Sports Medicine for people who have osteoporosis.

So the type of exercise that people with osteoporosis, or anyone who's working on their bone health, the type of exercise that should be included in your program is aerobic exercise. Any exercise that increases your heart rate is an aerobic exercise. For example, walking, using a stationary bicycle, walking outside or walking on the treadmill, jogging, using an elliptical. Any of these aerobic activity or heart rate bumping exercises should be a part of your program. Strength training. Strengthening exercise is defined as an exercise in which you are working against a resistance. Now this resistance could be a weight, it could be a resistance band, it could be your own body weight, it could be a machine at the gym. It could be any form of resistance. And that also needs to be included in your exercise program to improve bone health. And the last thing that needs -- and an important component is balance and flexibility exercises. So your exercise program to improve your bone health must include aerobic activity, strength activity, balance and flexibility activity.

And how often should you do it? Now, guidelines for how often you should do it vary depending on the type of exercise. Aerobic exercise can be done five to seven days a week. So you can go for a walk every day. You can walk on the treadmill every day. You could use your bicycle, stationary bicycle every day. You could go for a bike ride every day. You could jog every day. For how long? For about 20 to 30 minutes, and that's okay. And those are your guidelines to improve your bone health. So if you're picking that aerobic activity, you can go for that aerobic activity five to seven days a week for 20 to 30 minutes at moderate intensity. Anything that feels somewhat hard to do is your right intensity. So that's the zone that you want to be in. If you are trying to push yourself to a point where an exercise gets really hard for you to finish, then you're really pushing yourself over the limit. So as long as you are sticking with moderate intensity where you feel that this activity is not too easy, it's somewhat hard for me to do, that's your best state to be when you're exercising.

As far as strength exercises are concerned, recommendations are two to three times a week, 20 to 30 minutes at a time. And again, moderate intensity. Balance and flexibility exercises, these include

your -- examples of these balance exercises could be tai chi. Tai chi exercises have a huge backing from research. A lot of research is being put out there that shows that tai chi improves your balance and stability. And flexibility is mostly stretching, range of motion kind of exercises. And these can be combined together as a unit and can be done five to seven days a week, again, 20 to 30 minutes at a time, at a moderate intensity. So these are some of the basic guidelines that can be followed when you're talking about exercises. Next slide, please.

Okay. So I wanted to put in some points specifically for people who have had chemotherapy, or radiation therapy for that matter, and are concerned about their bone health. And a lot of times, before bone health comes into picture, people after chemotherapy are dealing with deconditioning. They are dealing with general fatigue and general weakness, especially after -- immediately after a session of chemotherapy. So at that time, focus really should be in general conditioning as per your tolerance.

So at that time, aerobic activity is the best thing to do, an endurance kind of activity where you're increasing the time. For example, I'll give you an example of an exercise. When you're dealing with deconditioning, you do want to make bone health as your long-term goal, but your short-term goal after that should be just to build up your stamina. So pick an exercise like using a stationary bike for a few minutes every day, and each time you do it, you try to beat the previous time by a few seconds or a minute, based on your tolerance. It should feel moderately intense kind of activity. You should be able to breathe normally when you're doing that activity. So focus on your stamina and endurance first.

Once you have that endurance and you feel like you're at some point where you can continue to do or perform an aerobic activity, for example walking, stationary bicycle, walking on the treadmill for at least 20 to 30 minutes, that's when you start adding strength exercises with resistance to your program. And then once you start adding those on, you can carry on with the guidelines that I mentioned before. But right after, immediate effects of chemotherapy will make you deconditioned, and at that time, the focus really should be to improve your stamina. So you work with aerobic activity and then move on to strength after that.

And for bone health, some of these movements are very important, and I'd like to quickly go over these movements. The correct way to bend, lift and get in and out of a chair is extremely important for you to make sure that you're protecting your back all the time and you're not putting your vertebral bodies at risk of developing a fracture. So when you're bending and lifting, you have to have your correct body mechanics. You can see a picture on the right where the person is lifting a box off the floor. So you initiate that movement right at your hips and knees to bend down and pick up the object. And I always try to make a point here that it's not the weight of the object. It could be a piece of paper you're picking up off the floor. But if your mechanics is not right, your chances of injury is more.

Similarly, getting in and out of a chair, in and out of a bed, make sure that your feet are flat on the floor and you're leaning forward, pushing down with your feet right into the floor and getting back up. If you're sitting all the way back in the chair, getting up from there could be hard, and it could be actually literally hard on your lower back. So protecting your spine is very important. Try to keep that lumbar spine as straight as possible by any physical activity or functional activity, for that matter.

So we talk about precautions called as BLT precautions, and I like to talk about it like that; bending,

lifting and twisting precautions. So, bending and lifting cannot be eliminated from your everyday functions, so you try to do it the right way. Twisting and extreme side-bending are two motions that are associated with increased risk of vertebral fractures. So we don't encourage twisting or extreme side-bending when you're exercising, or even in your functional activities, to make sure that your risk of vertebral fractures is minimum. Next slide, please.

So I also like to say that when we -- there is a reason we talk about these movement precautions, because oftentimes people ask questions about is this is a good exercise to do or not. And I always tell that if you know the basic principles, the basic precautions that you should follow to make sure you're not hurting yourself, which would be bending the right way, lifting the right way, not twisting and not extreme side-bending, these principles can be applied to any form of exercise, and it doesn't matter then what type of exercise you're doing. And if you're following an exercise like yoga or tai chi or stretching or Pilates or aerobics, any kind of exercise, if it involves a movement that asks you to twist or to extremely side-bend, you can always ask the person who's advising you on exercise to show you an alternate position because that's just not good for your bone health when you have osteoporosis.

So moving on. Lifestyle and nutrition for bone health, I have a few slides on nutrition. I am going to go a little quickly because we're kind of running out of time, but everything is listed here. And I just want to say that my last slide has my email and my direct contact on there. When we are doing the question-and-answer session, it'll be on. So people can -- if you have any specific questions that you think I couldn't answer today, you can always shoot me an email and I will make sure that I answer your questions.

So moving on. Lifestyle and nutrition are extremely important for bone health, and there are some key points to keep in mind. Physical activity, like we talked about. Nutrient-rich diet; basically diet that gives you enough calcium and vitamin D per day. Maintaining healthy weight is very important for your bone health. Daily calcium requirement, daily vitamin D requirement, I'm going to elaborate a little bit on these later. Fall prevention strategies, which you are going to make sure that you have enough strength, enough stamina, and this is also ties into the physical activity aspect we just discussed. Avoid smoking. Quit smoking if you do. And increased use of alcohol for more than two to three drinks per day several times during the week puts you at a higher risk for osteoporosis. So these are some key lifestyle changes that should be kept in mind. Next slide, please.

And this slide really shows you how much calcium you need per day. An adult from 19 to -- men of 19 to 71 years of age need about 1,200 milligrams of calcium. Children from 1 to 18 years of age need between 700 to 1,300 milligrams of calcium per day. And women from 19 to 50 years of age need 1,000 milligrams of calcium per day, and over 51, you need 1,200 milligrams of calcium per day.

Now calcium per day is important. It's very important for you to meet your requirement per day. A lot of people depend on supplements to meet this requirement per day. New studies have shown that your body is going to absorb calcium better and more from food as compared to supplements. So it's very important for you to read the full labels to know how much of calcium or to be able to estimate how much of calcium you are getting from your food items per day, and then supplement if you are not getting enough calcium per day. I'll explain that more on my next slide where I have a food label out there for you, and it explains to you that on every food item that you're buying -- and there are many resources out there. You can go to USDA.org that has specific calcium, you can say -

- it tells you calcium content of different food items per serving.

So it's very important for you to read the food labels to see per serving of a certain food, how much of calcium are you getting. And then put it all together at the end of the day and kind of estimate your daily intake of calcium. If you got about 1,200 milligrams of calcium from your food, you do not need to supplement. But if you are deficient and you got about only 1,000 milligrams, you only got about 800, 900 milligrams of calcium through your food, then you do need to supplement.

And the type of supplement is very important. You can talk to your doctor and see if they have any recommendations on the type of supplement you should be taking. Mostly doctors do advise over the counter supplements. If you go on our website, nysopep.org, it's written on the slide that you're viewing right now. It's the last bullet point. That's the website. We do have some recommendations for supplements as to not the brands, but there are certain USDA signs that you should be looking for when you're buying a supplement, and those signs are out there on our website. It educates you. There's a section that educates you on how to pick the right supplement for you, and that information has been taken and approved by USDA. So that would be a great resource for you. When you have some free time, go and take a look when you're trying to choose the right kind of supplement for yourself.

And here's a list of the some of the sources of calcium. And again, if you go on the website that I just mentioned to you, New York State Osteoporosis Prevention & Education Program website, all of these resources have been put out there, courtesy of Department of Health of New York State. So it's a credible resource. You can go on there and look at various sources of calcium and vitamin D and how much of them -- how much of calcium you get per serving from these food items.

A common list is put out there. There are dairy sources and non-dairy sources of calcium. Fortified foods that have been fortified with calcium, for example, non-dairy milk products, almond milk, coconut milk, flaxseed milk, hemp milk, et cetera. Juices. Orange juices are fortified with vitamin D and calcium. Tofu, grains, cereal bars, soy cheese, these are some of your fortified sources of calcium. And then there are non-dairy sources of calcium, for example, canned salmon and sardines, variety of dark green leafy vegetables are full of calcium. Dried figs, nuts, chia seeds, sesame seeds, legumes, all of these food items are rich in calcium and will help you derive the recommended daily amount of calcium.

Okay. So our next slide talks about vitamin D recommendations per day. Birth to 12 months, it's about 10 micrograms or 400 International Units. You can see, we're still changing from -- the labeling of vitamin D is changing from International Units to micrograms. And this change went into effect in January 2020. But you can still see some supplements out there that list vitamin D in International Units. So I've put both of them on there on this slide. The new labeling should have it in micrograms. So I put both of them out there.

And 1 to 50 years of age, it's between 400 to 800 International Units or 10 to 20 micrograms per day. Now this is your regular vitamin D requirement. But upon a blood test, if your doctor determines that you are deficient in vitamin D, then they can put you on prescription vitamin D as well. So this is also something that you should definitely discuss with your doctor before you go for an over the counter vitamin D to see how many milligrams you should be taking. Next slide, please.

And this next slide again talks about natural sources and fortified sources of vitamin D. And I will repeat again that on the website, nysopep.org, you can see an elaborate list of food items that

provide vitamin D sources and the amount of vitamin D in each serving size. So natural sources include fish, catfish, eel, flounder, halibut, salmon, mackerel, sardines, et cetera. Mushrooms, eggs, all of these are rich sources of vitamin D. And there are plenty of fortified sources out there, too, like milk, non-dairy milk alternatives, juices, yogurt, tofu, grains, et cetera. It's really important for us to look at food labels and see how much of calcium and vitamin D is packed into each serving so that you can estimate your intake per day. And then if you do need to supplement in case you were deficient on your recommended daily allowance, then you can supplement. Next slide, please.

And again, we talked about this before. Smoking and alcohol change your bone metabolism. They mess up your bone metabolism. Nicotine accelerates bone loss in men and women. Smoking also predisposes women to early menopause. And lack of estrogen after menopause is detrimental for bone health. So that just accelerates your bone loss. Alcohol reduces the number of bone making cells, affecting bone metabolism. So quit smoking if you do, avoid alcohol, and your bones will be healthy. Next slide, please.

And now we're open for discussion. So this is what I was saying. I have my email and I have the website, phone numbers all listed over here for you. If you have any questions specifically that I may not be able to answer, please feel free to reach out.

Robin Perlmutter: Payal, thank you so much for that great presentation. I'm going to now read you some questions from the Q&A. Have you had a successful experience with Xgeva?

Payal Sahni: This is a medication-specific question. I do not deal with medications. Everybody reacts differently to medications. And oftentimes, there are some specific reactions that someone can expect after taking a bone health medication. However -- no, I have not had any specific thing that comes to mind that I think I should discuss here with that -- pertaining to that medication.

Robin Perlmutter: Thank you. Someone else had a similar question. So anything specific to medications, they need to speak to their doctors, I take it. Okay.

Payal Sahni: As far as reactions are concerned. But as far as bone health is concerned, that is something that, again, your medical specialist has to look at your current medications, and then if you do need a medication for bone health, they need to make sure how these two medications will interact. And your medications, of course, have to be FDA approved. But that is a discussion you must have with your doctor to determine what would be the best course of action.

Robin Perlmutter: Okay. Thank you. Another question. We have someone wrote, "I have heard that bisphosphonates lay down bone but don't let you get rid of excess, thereby increasing your risk of fractures."

Payal Sahni: So there's a lot of -- I would say, yes, what you have heard is correct. However, there is a way bisphosphonates are given. I do not recommend -- it's not in the scope of my practice to prescribe medication, but I do work with a lot of people who are on these medications. So I'm just telling you from my experience, you should have a discussion with your doctor. But there is something called as a drug holiday in which what they do is they put you on a bisphosphonate for a certain amount of time, and then you're supposed to be off of it for a certain amount of time.

They do make sure that they track your bone density every two years or even every year to make sure that if you do need a catabolic, they will put you on a catabolic that will take away the bone. But that's also a specific discussion to be had with your medical provider who prescribes you the

medication. And that's why it's important for you as a patient to ask these specific questions to your doctor as to which is the right medication for you, for your -- based on your risk factors and based on your medical history.

Robin Perlmutter: Okay. Thank you. Another question. "Would you make these same guidelines and recommendations for someone with osteopenia?"

Payal Sahni: Yes, absolutely. These guidelines and recommendations are for low bone mass. So yes, they apply in a similar way, 100% similar way to anyone who has osteoporosis or osteopenia.

Robin Perlmutter: Okay. I have two more questions. We have one woman asking, on your slide with the vitamin D3 -- with the vitamin D, you didn't mention any guidelines for women over 50. Is there a reason that wasn't -- is verified -- I don't think it showed up. It said 1 to 50.

Payal Sahni: I think it did. It's 400 to 800 milligrams for anyone over 50. Oh, yeah, it didn't.

Robin Perlmutter: It's 400 to 800?

Payal Sahni: Yes, 400 to 800 milligrams.

Robin Perlmutter: Okay, great. Okay. Thank you very much for clarifying that. And then we have a couple more questions. Somebody would like to know, "What's involved with the FRAX tool? What kind of test is that?"

Payal Sahni: So FRAX tool is also based on your bone mineral density. It's just a virtual tool that your clinician uses on the computer. I can say it's a computer tool. So based on your bone mineral density, they look at how much of bone you have lost as compared to if you've had a bone mineral density prior to that. So they compare how much of bone you have lost, the rate of your bone loss. And then they determine that in the next 10 years, what is your probability of having a fracture. So it really isn't a special x-ray or anything like that, or a blood test, anything like that. But it's more of a calculation or calculated risk that is based on your bone mineral density readings.

Robin Perlmutter: Thank you. We have time for two more questions, folks. One woman asked -- a couple women are asking, would walking with a weighted vest help?

Payal Sahni: Yes. There are many studies out there that have shown that weighted vests do improve bone density. So, yes. There are many types of vests.

I'll tell you a little bit about the weighted vests. In physical therapy, weighted vests were first used to improve balance. Because the vest has weights, we can distribute weights in a certain fashion so it improves your balance. That's how they came into existence. But then over time, there have been studies that show that it improves your bone density, too, because it's putting extra pressure on your spine as you're walking. So yes, there's different types of --.

When you're picking a vest for osteoporosis, just make sure that the research that is associated with that particular type of vest was done on people with osteoporosis and not on people with balance. So that's something you have to keep in mind when you're picking a weighted vest.

I personally don't think that there is an amazing amount of research to back the use of weighted

vests for osteoporosis as there is to back the use of weighted vests for balance improvement. So if you're looking for balance training, stability training, people really have shown good results with weighted vests. Not so much with osteoporosis.

Robin Perlmutter: Thank you. And the last question is, "Are there names for the biochemical markers that are looked at in the blood work?"

Payal Sahni: Yes, there are. And we have specified those on our website as well. If you go on our website, which is listed here on this slide, you can see that we have specifically explained what blood bone markers they are looking for, and you will find all that information on there.

Robin Perlmutter: Okay. Well, thank you so much, Dr. Sahni. This concludes our presentation. We just want to thank you for your passion, dedication and commitment to the work that you're doing, the cancer community and everyone at large right now, especially during these challenging times. And I'd like to thank all of you for coming out today to become educated on this very important topic. Have a great day, everyone. Thank you.

Payal Sahni: Thank you. And I would also like to thank everybody to take the time to listen to me. Thank you so much. And please feel free to send me an email if you have any further questions. If you think I have not answered something specific that you were looking for, feel free to please email me. If I don't know it, I'll find out the answer and get back to you. Thank you.

Robin Perlmutter: Thank you very much.