Expert Voice Podcast- Daniel Roytas CONTENT EDIT.mp3we

Victor I'm Victor Tuballa and this is Expert Voice, Eagle Natural Health's podcast and your partner in natural health and wellbeing. Joining us on the line today from Brisbane is Daniel Roytas, naturopath, nutritionist and owner and principal laser therapist at Ultima Healthcare in Queensland. Daniel has over nine years of clinical experience including experience with musculoskeletal therapy, which is a type of treatment to help with back pain, neck pain, joint pain and muscular dysfunction. He is also the senior lecturer of Nutritional Medicine at Torrens University and the Australasian College of Natural Therapies. Furthermore, he is a published author and public speaker regularly presenting to healthcare practitioners at seminars across Australia. I'm pleased to welcome Daniel to today's podcast. Daniel, thank you very much for your time today and welcome to Expert Voice.

Daniel Thank you very much for having me Victor. Pleasure to be here.

Victor Today we're going to be talking about the importance of bone health. How you can best look after your bones from when you're a child right through to the twilight years of your life.

Bone health is something that many of us may not necessarily think about until we're older and may experience a fracture. Can you explain to us why looking after our bones should start a young age?

Daniel Most of our traditional thought processes around osteoporosis is that it only affects us once we reach a certain age that we get older and our bones start to become weak and brittle. We do need to be mindful and conscious about our bones from a young age because the peak mineral density for men and women occurs between about 25 and 35 years of age. Whatever our bone mineral density is at that point in time, it will never be greater than that. It will start to decrease decline as we age.

We want to make sure that we're getting our peak bone mineral density as high as we can get it by the age of 25 to 35. We've also seen in some of the research, is that by undertaking certain types of physical activity in adolescence during our teenage years, we can actually significantly increase the amount of bone mineral density that we have. What we've found, is that just by increasing your peak mineral density and your mineral density in general in adolescence by about 10%, you delay the development of osteoporosis by about 13 years, which is quite significant.

Victor You also mentioned osteoporosis, and this leads to my next question, which centres around two of the most common types of bone conditions - osteoporosis and osteopenia. For the benefit of our broader audience, could you tell us how these conditions are linked to increased bone fragility and risk of fractures?

Daniel Absolutely. I'll preface what osteopenia and osteoporosis are to start with. They're both very similar in their aetiology [cause or set of causes]. Osteopenia is still defined as a low bone mineral density, but it's not as severe or as significant in the amount of loss that's occurred with the bone.

Osteoporosis is a more advanced form of bone loss. Think of osteopenia as the early stage and osteoporosis is the later stage of that condition. Some people may never develop osteoporosis, even if they do have osteopenia and, certainly, we know that both of

those conditions can be reversed. There are things that can be done to achieve that with both osteopenia and osteoporosis.

There's like a sponge-like material on the interior compartment of the bone, which is called the trabecular bone, and a hard, compacted outer layer of bone called the cortical bone. Both of those parts of the bone will lose density. There’s a thinning of the cortex and reduced trabecular bone mass with both osteopenia and osteoporosis.

It’s important to mention that osteoporosis is completely preventable, and it is treatable, despite what some people may understand. They think that once they’ve got it, they've got it for life. There is some good evidence to suggest that certain dietary therapies, lifestyle therapies, and exercise-specific types of exercise can reverse it.

Also, there's two different types of osteoporosis: primary and secondary. Primary is basically an idiopathic condition. We're not actually sure what causes it, as there's no underlying condition, disease or driving factor. It's apparent for people with osteoporosis known as secondary osteoporosis, which is defined as low bone mass. There are micro-architectural changes in the bio-mass, as well in the presence of another disease or pathology. It could also be that there's some type of medication that the [diagnosed] person is taking, which could cause secondary osteoporosis.

About 30% of women and 80% of men have secondary osteoporosis. Primary osteoporosis is seen more often in women and less in men, but it can affect both.

A lot of people can have osteoporosis for many years, and don't realise it until they've had a fall and fractured a bone. They will then have that bone fracture investigated and may be diagnosed with osteoporosis and poor bone mass.

Victor There are other risks when bone mess is reduced, such as osteoporosis, and of course, bone fractures. Are there any other health risks?

Daniel Research shows that around 95% of those who have osteoporosis has at least one other morbidity. This means that there could be some underlying process, which has actually contributed to the cause of osteoporosis, and that is also manifested in some other condition. The most common comorbidities seen in people with reduced bone mineral density is arthrosis and arthritis, a degeneration of a joint, or inflammation of a joint. Chronic lower back pain, depression and chronic heart failure are quite closely associated with osteoporosis.

Victor There's quite a number of other related conditions that we would not necessarily relate to bone mass and bone density. You have touched upon lifestyle factors as a very important part of bone health. It's widely known that these factors can have a positive impact on the health of our bones. Could you take us through a selection of these lifestyle factors and explain how such factors can benefit us in maintaining ideal bones?

Daniel The first one that comes to mind, and is probably the least focused on, is exercise. Specific types of exercise have to be undertaken in order to have a beneficial effect on improving bone mineral density. If we're able to strengthen the muscles and allow better support for the skeleton and expose the skeletal structure to certain stresses, we can actually increase the amount of the bone deposition and the bone mineral density can reverse.

Another factor is a person's BMI. We know that there's a significant increase in risk fractures in people who have a BMI of less than 20. If we're identifying someone who's got a BMI of 17 or 18, we can certainly help them with dietary and lifestyle intervention to increase their BMI.

It doesn't actually work the other way. An incremental increase above a BMI of 20 isn't associated with a protective effect. There's a very narrow range within that BMI where

we're having the most optimal effect. Anything between that 20 to 25 BMI is ideal in terms of weight.

Victor What are the key nutrients that contribute to healthy bones. From a dietary perspective, what are the best food sources of such nutrients?

Daniel When we're looking at maintaining bone health, there's some standard nutrients that most people would think of for preventing and treating osteoporosis.

One of the main ones is calcium. It works harmoniously with vitamin D. Trace minerals such as boron and manganese are quite important. Potassium, magnesium and copper are also a must. They all play a role in the production of bone density and the maintenance of bone health.

When looking at certain foods to increase our bone density levels of these foods, dairy products have been proposed as a good way to get a lot of calcium in a person's diet. There's lots of other foods that aren't necessarily coming from a dairy source, which are very high in calcium as well. Nuts and seeds are quite high in calcium. Lots of fruits as well - orange is very high in calcium, as are green beans.

Some research suggests that dairy intake in some individuals can cause pro-inflammatory reactions or responses in the body. A pro-inflammatory environment has been linked to increased bone resorption. For those who have an aversion to dairy, consider those other sources.

Potassium is also really important, as it’s one of the major components of bone. You get potassium from avocados, bananas, potatoes, green leafy vegetables and fish.

Copper is also very important. It’s found in a lot of herbs, spices, nuts, seeds and grains. Mushrooms are a source of copper, as are dried apricots.

There's also lots of ‘accessory foods’ that you can eat, which have been shown to have direct inhibitory or stimulating effects on osteoclast and osteoblast activity. With osteoporosis, we’re looking to inhibit osteoclast activity and increase osteoblast activities. Osteoblast activities means we’re getting more bone being built . Blueberries and plums contain anthocyanidin, which has been shown to inhibit osteoclast production.
Green tea has been shown to regulate osteoclast cell death. Citrus fruits contain limonoids and flavonoids. Onion contains quercetin and various organ Sulphur compounds - they've all been shown to reduce levels of oxidative stress and decrease bone resorption.
Alfalfa sprouts have been shown to decrease the secretion of cathepsin K, which is a compound released by osteoclast in the reabsorption of bone. It also increases levels of beta glucuronidase, which can help increase osteoblast activity.
These foods aren’t just providing the nutrients, they're actually having a direct effect on the activity of those cells.

Victor We’ve all been led to believe that dairy products are the only source of calcium, but it's nice to know you've also have options such as nuts, seeds and oranges. As a nutritionist you will be well aware that not everyone has the best diet. It's an area that a large portion of our population struggles with on a daily basis. If a person's diet isn't sufficient in providing the nutrients needed for good bone health, are there specific supplements that might help fill the gap?

Daniel From a supplementary perspective, I guess everybody knows about the importance of calcium and vitamin D. Calcium and vitamin D must be given together. What we know is that if you have insufficient levels of calcium or insufficient levels of vitamin D, if you just give one or the other, there's an extremely negligible effect on increasing bone mineral density. You have to give calcium and vitamin D together.

One of the forgotten nutrients, from a supplementary perspective, is potassium. I think a lot of people are a bit scared of supplementing with potassium because of the potential effect it can have on the cardiovascular system. However, when we look at the percentage increase in bone mineral density with potassium supplementation compared to calcium, potassium supplements will increase by mineral density by about 8 to 11%. Calcium supplements generally increase your bone mineral density less than 2%.

Victor That's a big difference. It’s wonderful that potassium increases bone density by such a high percentage. You mentioned vitamin D having a very important synergistic effect when it comes to calcium. That combination is of course known as the sunshine vitamin. Could you explain what the sunshine vitamin is, and why safe sun exposure is so important for bone growth?

Daniel Studies have shown that after supplementing vitamin D levels for six to eight weeks, study participants Vitamin D levels fell below their starting point within one month of stopping.

This may be because Vitamin D is either not being absorbed properly or utilised properly in the body. What we do know is that exposure to UVB light up-regulates vitamin D concentration levels. We actually don't lose that effect. Getting a big bout of vitamin D from regular healthy sun exposure is probably more beneficial than taking a vitamin D supplement.

To explain further: pre Vitamin D is just calciferol, which is produced in our skin. This goes to the liver and gets converted into calcidiol. It then goes to the kidney to be converted into calcitriol, which is our active form of vitamin D.

There are different forms of supplements that you can get, which contain either the 25-hydroxyvitamin-d or the 1,25-hydroxyvitamin d. These are the inactive and active forms, respectively.

When it comes to the sun, we don't really have to worry about specific types of vitamin D, because the body does that conversion itself. We do need to be sure that people have got a normal healthy liver function and normal healthy kidney function to allow for conversion of that pre vitamin D into the active form.

In Australia, to increase your vitamin D concentrations or serum levels involves about 15% of the body being exposed to the sun (outside of the hours of 10am to 3pm), about three to four times a week for less than 10 minutes. It differs in different countries at different latitudes.

Our skin produces a maximum of 10,000-20,000 units of Vitamin D a day, and it becomes capped once serum levels reach about 150 nmol. It’s very hard to overdose on it from the sun. If you are concerned about vitamin D levels, get it through sun exposure as mentioned above.

Victor Sun exposure, the fact that you mentioned just less than 10 minutes of sun exposure three or four times a week is adequate, leads me to ask: what are the optimal bottom levels and how can we find out what our vitamin D levels are?

Daniel That's a very complicated question to answer. In the research that I could find, 50 nanomole (nmol) appears to be the minimal amount of serum Vitamin D required to maintain health. That's the very minimum nmol/L. The upper figure for optimal level is between 125 nmol/L and 150 nmol/L of serum Vitamin D. Once we are able to achieve levels of 125 nmol/L, it seems that calcium supplementation actually works a lot better.

For anybody who has a serum vitamin D level of less than 50, a calcium supplementation has been shown to have a very negligible effect. We need to ensure we're getting people's vitamin D levels up before we start supplementing with calcium. It's really, really important with vitamin D supplementation.

We can work out how much Vitamin D a person may need each day to increase their levels. For every 2.5 nmol we want to increase, we give them 100 international units of vitamin D.

Men need to be given for a minimum of 12 to 20 weeks to achieve a substantial increase in the plasma concentration of vitamin D and to maintain that level.

The recommended doses are about 600 to 1,000 international units a day for children; 1,500 to 5,000 for adults; and 4,500 to 6,000 for overweight and obese people. It needs to be given for approximately 12 to 20 weeks minimum duration.

Victor That's good to know, because it is quite confusing, whether you're a child or adult, and when you're getting measured for your Vitamin D levels. I'm glad that you clarified the baseline level of 50 as being the minimum requirement.

More importantly, you mentioned supplementation of calcium. Not every calcium supplement has Vitamin D with it. This could be something worthwhile investigating if someone's taking calcium and yet their bone density levels or bone density aren't improving. Could it be because they have Vitamin D levels that are low to begin with?

To another area of bone health - the area of menopause. We know that menopause is a time in a woman's life where she needs to be particularly mindful of bone health. Why is this?

Daniel Oestrogen is the regulating hormone for osteoblast and osteoclast differentiation, production and activity. When we have sufficient oestrogen levels, it's able to regulate

bone mineral density in a number of ways. As I mentioned, it can help with the differentiation, production and function of osteoblasts and osteoclasts. When we have normal levels of oestrogen, we produce a healthy number of osteoblasts and a healthy amount of osteoclasts, so it's regulated. When we lose a certain amount of oestrogen production, we get a significant increase in both osteoblasts and osteoclasts production. However, we lose a lot of osteoblastic activity as osteoclastic activity increases and we get bone resorption happening.

Oestrogen also has an effect on reducing certain receptors, or the activation of certain receptors on osteoblasts and osteoclasts. This sort of aberrant function occurs when the osteoclasts go out of control, and the osteoblasts aren't getting the signals they need to function normally.

Oestrogen also regulates the mechanoreceptors in osteocytes. They're dormant osteoblasts, which are incorporated into bone and they can sense the density of bone. When it becomes reduced, there are certain chemicals that are released by osteocytes to promote bone reabsorption and new bone deposition. When we don't have enough oestrogen that osteocyte activity is lost. The bones will basically just sit there and not remodel, and we'll be getting lots of minerals being pulled out of the bone for other reasons. It will just continue to make the osteoporosis worse.

Victor That's good to know for women out there who are going through the change of life and menopause to be very mindful of the fact that this could be an area of bone health that could become an issue. What about men - do changing hormone levels affect bone health in men as well?

Daniel We know with women approaching menopause that their oestrogen production will decline and that will lead to a reduction in bone density. The same is also to be said for males as well.

What we've seen is that oestrogen plays a very important role in the regulation of osteoblast and osteoclast function. In men that function can be lost, or it can be impaired as androgen concentrations actually fall. Why do androgens have any impact on the amount of oestrogen that's being produced in the body? It's because the androgens are a direct precursor to oestrogen. Androgens are aromatised into oestrogen, so as we lose androgen production as men age, they will then have a lowered amount of oestrogen production. This can suddenly be a major factor for men. Rather than actually trying to directly increase oestrogen in males, we can look at increasing androgens, and that will then be aromatised into oestrogen.

Victor You mentioned androgens in men and the importance of androgen levels. What are some of the best ways to improve androgen levels in men?

Daniel There's a couple of different nutrients and herbs that can be used. We know that high dose zinc can inhibit with an aromatase inhibitor. If we're not cautious with the amount of zinc that we're giving to patients, then that can certainly have a negative impact on the production of oestrogen across androgen.

We typically think of zinc as something that we want to give to men to increase their libido and testosterone production. Once we start approaching around 100 milligrams per day there can be some inhibitory effects on that aromatase enzyme, so oestrogen is not being produced. We must be careful with that in regard to herbs.

Saw palmetto is an alternative. This actually reduces the conversion of the active testosterone. There's more in the pool for it to be converted across to oestrogen.

Exercise is very important. For men, and women as well, doing some sort of weight bearing exercise that's going to engage a lot of the larger muscle groups, particularly the muscles in the legs, will increase growth factors and testosterone production. Androgen production will increase, which will affect the production of oestrogen.

Victor What does a bone density test involve? What can it tell us and when is the best age to have it done?

Daniel A bone mineral density test involves a scan called DEXA scan. This stands for dual energy x-ray absorptiometry scan. These devices are relatively expensive and they're usually quite big, so they're in limited clinics in medical facilities, although there are some mobile vans.

When we're doing this particular scan, they're looking at the density in the femoral neck of the main bone in the leg, the femur. The information that's provided from the DEXA scan is given in either T-score or a Z-score. A T-score refers to the comparison of the person's bones being assessed, to that of a healthy 30 year old of the same sex. The Z-score is a comparison of a person's bone density to that of a person of the same age and sex who has relatively good bone mineral density.

The one typically used for the diagnosis of osteoporosis is the T-score. Anything less than one standard deviation away from the mean is considered normal. Anything up to 2.5 standard deviations away from the mean is considered osteopenia, and anything greater than 2.5 is considered osteoporosis.

With osteoporosis, there's a lot of people who have this condition who aren't diagnosed.

If you're approaching menopause, or if you've had early menopause then it's probably a good idea to get the DEXA scan done.

It’s recommended for those of 30 years of age, to assess peak bone mineral density. Women around the age of 50 should also have a DEXA scan, although I would recommend going earlier to catch any problems before they become an issue.
There is another tool used in a lot of clinics, called FRAX - fracture risk assessment tool. This can give a patient an indication of what their fracture risk is, independently of whether or not they've got their DEXA scan, T-score back or not. This is something that can be done quite easily in clinicians' consultation rooms. It can be done online and requires standard information from a client.

Victor It's good to know that there are options available when it comes to bone density testing such as the DEXA scan. We now know that healthy bones are not just an area of health that should only be a concern as we get older – it applies to children right through to our elderly population. We can all benefit from this advice in helping to maintain strong bones and avoiding health concerns such as osteoporosis and bone fractures in the future. Daniel, once again thank you so much for taking us through this very important topic of bone health.

Daniel You're welcome Victor. Thank you very much for having me on.

Victor We encourage you to consult with your health care practitioner for advice on whether supplements are suitable for you. If you've enjoyed what you've heard today, we'd appreciate you jumping onto iTunes to provide us with a rating and a review. If you have a topic that you'd like us to cover, we want to hear from you get in touch with us via the Eagle Natural Health website, which is www.eaglenaturalhealth.com.au in the Contact Us section. I'm Victor Tuballa, thanks for listening.