Osteoporosis Prevention: What can we tell patients?

ABSTRACT

Osteoporosis (OP) is the leading cause of hip fractures in patients. Primary prevention focusses on engaging in strategies that prevent the development of osteoporosis. Physicians often provide health information to patients on how to optimize their overall wellness, and therefore, ought to educate patients on bone health as well. Offering advice on specific interventions that decrease the risk of developing OP is an effective way to engage patients in maintaining peak bone mass. Physicians should counsel patients on key points such as dietary modifications, physical activity, and decreasing the use of alcohol and smoking. Setting mutual goals with patients and ensuring that they understand the positive impact this will have on their health is critical.

KEYWORDS: Osteoporosis, bone health, health promotion, primary prevention, education

CME Pre-test Quiz

Osteoporosis (OP) affects approximately 2 million Canadians and is the leading cause of hip fractures in patients.[1] Appropriate screening and identification of OP can lead to the early initiation of interventions—pharmacological and nonpharmacological—in order to prevent further complications. Ideally, however, physicians will educate patients on strategies to optimize bone health, and hopefully, prevent OP from developing, or minimizing the impact it has on patients.[2] This article will discuss some of the interventions that physicians can implement in their practice to assist patients in optimizing their bone health, and hopefully, prevent or mitigate the complications of OP. Throughout this article, please note that these guidelines refer to adult bone health, primarily in patients > 50 years old.

It is known that peak bone-mass develops during adolescence and early adulthood, although the exact age remains unknown.[1] It is thus important to inform patients that the habits they engage in at a young age will surely impact their bone

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health in the future. The risks associated with poor bone health include as OP leading to fractures, decreased muscle mass and strength, weakness, etc. As is the case with many health concerns, early intervention and prevention (i.e. primary prevention) is critical. Although official screening (i.e. using bone mass density scans) does not typically start until the age of 60 years old, physicians ought to counsel patients on bone health prior to this. Framing conversations in a manner that is relevant to the patient is essential. Patients must understand that adequate bone health in early adulthood has a significant impact on the future risk of OP and fractures.

Figure 1: Exercises for Bone Health

Taken from http://www.osteoporosis.ca/wp-content/uploads/OC-Too-Fit-to-Fall-or-Fracture.pdf?_ga=2.6047475.1968449300.1576535790-403957637.1576535790

Several strategies aimed at optimizing bone health are, in fact, 'general lifestyle tips' that physicians usually counsel their patients on. Evidence suggests that exercises, and a healthy diet have important impacts on bone health. Thus, when educating patients on these interventions, physicians can tailor health advice specific to OP prevention. For example, when discussing physical activity, physicians can recommend that patients integrate strength or weight-bearing exercises in their routine. This includes activities such as walking, squatting, step aerobics, lunges, etc.[3] In addition, balance exercises like tai-chi, yoga, and heel raises are useful. In general, it

is recommended that patients aim to do strength-training exercises at least twice a week, and balance activities each day. The general 150-minutes of physical activity (aerobic, enough to increase the heart rate to a moderate level) is also beneficial for bone health. A useful handout that patients can be offered in outlined in Figure 1.

Nutritional advice should also be offered. It is well-known that calcium and vitamin D promote bone health, however, the specifics of this are often misunderstood. A simple recommendation is to counsel patients that calcium intake is ideally obtained through the diet. It is important to counsel patients that their daily calcium intake varies according to age, but generally, most patients require 1000-1200 mg of calcium intake per day.

Patients may inquire about supplements for bone health—usually this will be whether or not they should take calcium and/or vitamin D pills. It is important to remember that adults usually need 1200mg of calcium, and 1000-2000 IU of vitamin D each day. As previously noted, calcium needs should primarily be from the diet, with the recommendation that a 500mg supplement of calcium can be utilized if the patient does not obtain enough from the diet. In contrast to this, it is difficult to obtain our vitamin D needs from diet alone, and hence, a supplement is important. Adults should be advised to take 1000-2000 IU (which is usually in the form of one to two pills) of vitamin D each day.

Other lifestyle modifications include decreasing alcohol intake and the use of caffeinated beverages, maintenance of a healthy weight, and smoking cessation. Figure 2 outlines general lifestyle advice that physicians can provide to patients. Figure 3 outlines important nutrients for osteoporosis prevention.

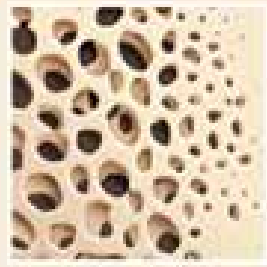
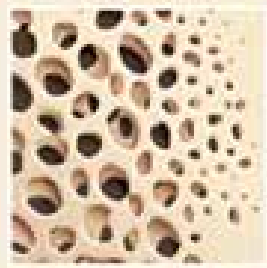
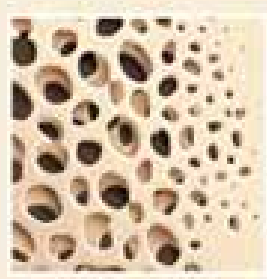
It should be noted that many patients report 'knowing what

Figure 2: General Tips for Bone Health

Adapted from https://www.nof.org/patients/nof-resource-library/stress-infographic/

Figure 3: Important Nutrients for Osteoporosis Prevention

Nutrition plays an important role in the acquisition of bone mass at many levels. Comprehensive nutritional counselling is important in the prevention of osteoporosis.

Nutrient	Source	Function	Bone Density
Calcium	milk, cheese, butter, yogurt almonds prunes seaweed	Building block of bone Increases bone density	 Increases density
Vitamin D	sunlight eggs cheese leafy greens dates	Builds and maintains healthy bones Maintains calcium balance Reduces frequency of falls and fractures	 Increases density
Protein	lean meat fish poultry eggs nuts beans	Osteoporosis prevention and treatment Diets high in protein can induce a negative calcium balance, which could lead to bone loss	 Excess decreases density
Sodium	salted foods	Promotes calciuria Excess dietary sodium may reduce bone mineral density	 Excess decreases density
Caffeine	coffee soft drinks	Decreases bone density Increases risk of hip fracture	 Decreases density
Vitamin K and Isoflavones	beans soy products fruit leafy greens	Synthesis of bone proteins such as osteocalcin (involved in mineralization) Second-line therapy for osteoporosis Ipriflavone maintains BMD	 Increases density

to do', but do not actually follow-through with instructions regarding lifestyle changes and preventative health measures.[4] This discrepancy can be attributed to multiple factors including lack of clear instructions about specific exercises to engage in, how/when to take supplements, risks associated with osteoporosis, etc. It is essential that in providing this education, physicians gauge how much patients know about the proposed interventions; as well as what resources, strengths, and barriers they have in achieving these goals. Doing so permits shared decision-making to occur, and increases the likelihood that patients will engage in health-promoting behaviours. For example, physicians may advise patients to 'cut back on smoking and get more calcium in the diet'. Instead, framing this in a patient-centered manner that educates patients WHAT they need to do, WHY they need to do it, and HOW they can go about doing this can sound like: 'smoking decreases the strength of your bones, and so does inadequate calcium intake. This can increase your risk of fractures. We can work together on setting a couple of goals around this. Do you think you can reduce your smoking from 7 a day to 5? Or what about adding a slice of cheese and yogurt to your breakfast?'.

EVIDENCE SUGGESTS THAT EXERCISES, AND A HEALTHY DIET HAVE IMPORTANT IMPACTS ON BONE HEALTH. THUS, WHEN EDUCATING PATIENTS ON THESE INTERVENTIONS, PHYSICIANS CAN TAILOR ADVICE TO OP PREVENTION.

Patients should be involved in creating goals around these behaviour changes, and physicians should follow-up with patients to see their progress. Other strategies to educate patients around measures to prevent OP have been studied and show efficacy, including hosting 'workshops' on bone-promoting tips, providing handouts and PowerPoint presentations, links to useful videos and websites, etc. Indeed, patient education and empowerment is critical for these measures to be successful.[5] There are several evidence-based resources available for patients to learn more about bone health.

Figure 4: CALCIUM mnemonic key points physicians should discuss with patients about bone health promotion

- Calcium and vitamin D in your diet
- Aerobic activities
- Limit alcohol
- Cut down on smoking
- Increase balance
- Use supplements if prescribed by your doctor
- Maintain a healthy weight

SUMMARY OF KEY POINTS

1) Educating patients about methods to decrease the risk of osteoporosis is a critical role of the physician, as peak bone mass develops in early adulthood

2) CALCIUM (see figure 4) is a mnemonic that can help physicians recall what strategies they can address with patients: calcium/vitamin D intake, aerobic activities, limit alcohol, cut down on smoking, increase balance, use supplements if indicated, and maintain a healthy weight

3) Physicians should provide patients with resources and referrals if appropriate to ensure patients receive adequate information/support in promoting their bone health

Osteoporosis Canada has a variety of videos, infographics, and tools that patients can freely access to obtain more information. If physicians work within settings where resources permit, referral to a dietitian to educate about calcium and vitamin D intake can be useful, as can referral to a physiotherapist for information on balance and weight-bearing exercises.[6] If patients are at increased risk for falls, an occupational therapist can also assist in conducting a home assessment and recommending interventions such as devices, removing rugs, etc.

I have created a simple mnemonic that highlights some of the discussion points physicians can have with their patients on bone-optimizing measures they can take. The mnemonic, CALCIUM, can be found in Figure 4. Essentially, when discussing bone health with patients, physicians should ensure that they highlight the importance of adequate dietary intake of calcium and vitamin D (using supplements when required and/

CLINICAL PEARLS

Patients should be advised that a vitamin D supplement is required to obtain the 1000-2000 IU daily requirement

A calcium supplement is not always indicated if dietary intake is adequate

Both aerobic and weight-bearing activities are essential for OP prevention

Smoking cessation and limiting alcohol are also factors that impact bone health

Patients should be encouraged to mutually set goals around bone health with their physicians, as this increases the likelihood that their behaviour changes will be successful

or advised), limiting alcohol and smoking, and engaging in a variety of exercises (aerobic and strength-training).

Overall, identifying areas where patients can optimize their bone health is essential.[2] Important interventions to discuss with patients include the intake of calcium and vitamin D (both through diet and supplementation as appropriate), incorporating different types of physical activity into their regime, smoking cessation, decreasing the consumption of alcohol, etc. Providing patients with specific advice and guidelines on how they can engage in these behaviours is critical. Early intervention towards optimizing bone health not only prevents OP, but also decreases the burdens associated with the complications of OP.[6, 7] As with many—if not all—health conditions, setting goals with patients on how they will promote their bone health is an effective method in the primary prevention of OP.[2]

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