



Osteoporosis Canada

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osteoporosis

update

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for Canadian physicians

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Be prepared when your patients ask about nutrition

**"At my age the bones are water in the morning until food is given them."
— Pearl S. Buck (1892–1973)**



David A. Hanley, MD, FRCPC, is Professor in the Departments of Medicine and Oncology, Division of Endocrinology and Metabolism at the University of Calgary Health Sciences Centre in Alberta.

This issue has shifted our emphasis from topics like bone density and new pharmacologic therapies, and addresses nutritional issues that are worthy of attention. In Canada, we are fortunate to have experts like Dr. Susan Whiting, who is a leader in the field of nutritional effects on bone. She and Dr. Hassanali Vatanparast have provided an excellent review of recent research in this area, from which we should be able to update our 2002 clinical practice guidelines positions on the role of nutrition in osteoporosis. The authors summarize important work in the area of calcium and vitamin D, bring forward new cautions regarding the effects of excess vitamin A on bone, and review a number of other interactions between nutrients and bone. I hope that physicians will find this information useful in answering some common nutrition questions that their patients ask.

Dr. Diane Theriault has reviewed and distilled a large body of literature in answering a physician's question about the link between multiple sclerosis and a variety of osteoporosis-related problems, including falls, fractures, low bone mass and vitamin D inadequacy. Readers may be surprised to see the large amount of research that has been done in this area.

Given the focus of this issue on nutrition, it is appropriate that Osteoporosis Canada has taken this opportunity to announce the awarding of the first grant arising from the renewed health of our research fund to two scientists at the University of Toronto. Dr. David Cole and Dr. Reinhold Vieth are examining links among vitamin D, bone and fat metabolism.

David Hanley

Osteoporosis Canada and the Editorial Board are committed to providing reliable, current information to support health professionals involved in the daily clinical management of osteoporosis. In order to better address your needs and concerns, the Scientific Advisory Council welcomes your questions or comments.

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Don't neglect bone health in MS patients

Mrs. S. B. is a 55-year-old woman who has been living with multiple sclerosis (MS) since the age of 30. Her MS is gradually getting worse, and over the past several years she has required a walker to get around. Six years ago, she fell down six steps and fractured her wrist, but has had no other falls or fractures. Her only steroid exposure was three days of pulsed IV steroids 10 years ago.

She has one serving of yogurt and takes a multivitamin each day. Mrs. S. B. reached menopause at age 50, and is healthy apart from her MS. She has no family history of osteoporosis or fragility fractures. She consults you about having a bone mineral density (BMD) test.

Dr. Diane Theriault is a rheumatologist at Dartmouth General Hospital in Dartmouth, Nova Scotia.

Dr. Diane Theriault comments: Osteoporosis Canada's 2002 clinical practice guidelines recommend BMD testing for postmenopausal women with one major or two minor osteoporosis risk factors (Table 1; Brown J et al. *CMAJ* 2002;167:S1-34). Mrs. S. B. appears to have no major risk factor: the fracture sustained from falling down six steps does not constitute a fragility fracture, she had only three days of IV steroids, and she has had only one fall in the past 10 years. One minor risk factor — low dietary calcium intake — does not warrant a BMD measurement at this time. But it is important to remember that the 2002 guidelines focused on primary osteoporosis and did not undertake a formal review regarding risk factors for secondary osteoporosis.

What is the connection between MS and osteoporosis?

In MS patients, BMD decreases with ambulatory impairment, particularly at the hip (Formica CA et al. *Calcif Tissue Int* 1997;61:129-33; Weinstock-Guttman B et al. *Mult Scler* 2004;10:170-5). BMD at the spine tends to be relatively preserved. People with MS suffer

more fractures (according to one study, their fracture risk was 10 times higher compared to age- and gender-matched healthy controls [Cosman F et al. *Neurology* 1998;51:1161-5]). Falls are an important risk factor for fractures. Individuals with MS may exhibit lower extremity weakness, lack of coordination, poor balance, visual disturbances, impaired gait, seizures and depression — all known risk factors for falls in the general population. A study in MS patients linked poor balance, gait impairment and use of a cane with an increased risk of falls (Cattaneo D et al. *Arch Phys Med Rehabil* 2002;83:864-7).

Studies on the effects of pulsed corticosteroids in MS patients on BMD measurements are conflicting. Some have found no correlation (Tuzun et al. *Mult Scler* 2003;9:600-4; Zorzon M et al. *Eur J Neurol* 2005;12:550-6; Schwid SR et al. *Arch Neurol* 1996;53:753-7), while others noted significant bone loss with longer duration of therapy (Cosman, 1998). The published studies on steroid use and fracture risk in MS have weaknesses, including small sample sizes, enrolment of relatively young, low-risk patients, and no data from spinal x-rays. There is currently no published evidence of an increased risk of fracture in MS patients treated with pulsed IV corticosteroids.

Other drugs used in MS may also be implicated. Approximately 10% of MS patients suffer seizures. Anti-epileptic drugs are associated with low vitamin D levels and osteoporosis risk. Anxiolytics and antidepressants used to treat anxiety and depression — more common in MS patients than in the general population — have both been linked with an increased risk of falls.

Vitamin D and MS

The incidence of MS generally increases with distance from the equator, possibly due to decreased sun exposure associated, in turn, with lower vitamin D levels. There has also been a suggestion that active MRI lesions in MS patients are inversely correlated with mean duration of sunlight noted four months prior (VanAmerongen BM et al. *Eur J Clin Nutr* 2004;58:1095-109). This would also correlate with the period when vitamin D levels tend to be lowest.

Women in the Nurses' Health Study who took vitamin D from multivitamins had a 40% lower risk of developing MS than those who did not. The effects of vitamin D could not be separated from those of other constituents of the multivitamins (Munger KL et al. *Neurology* 2004;62:60-5).

House-bound MS patients, or those who suffer from heat-induced exacerbations, may get less, or even no, sun exposure. (Nieves J et al. *Neurology* 1994;44:1687-92).

Continued on page 10

Table 1

Who should be assessed for osteoporosis?

Major risk factors

- Age ≥ 65 years
- Vertebral compression fracture
- Fragility fracture after age 40
- Family history of osteoporotic fracture (especially maternal hip fracture)
- Systemic glucocorticoid therapy of > 3 months duration
- Malabsorption syndrome
- Primary hyperparathyroidism
- Propensity to fall
- Osteopenia apparent on x-ray film
- Hypogonadism
- Early menopause (before age 45)

Minor risk factors

- Rheumatoid arthritis
- Past history of clinical hyperthyroidism
- Chronic anticonvulsant therapy
- Low dietary calcium intake
- Smoker
- Excessive alcohol intake
- Excessive caffeine intake
- Weight < 57 kg
- Weight loss > 10% of weight at age 25
- Chronic heparin therapy

What's new in nutrition?

An update since the 2002 Osteoporosis Canada clinical practice guidelines



Susan J. Whiting, PhD, is Head, Nutrition and Dietetics, at the College of Pharmacy and Nutrition, University of Saskatchewan.
Hassanali Vatanparast, MD, is a PhD candidate at the University of Saskatchewan, examining the effect of nutrition on bone health from childhood to early adulthood.

The Osteoporosis Canada (OC) 2002 clinical practice guidelines for the diagnosis and management of osteoporosis¹ included dietary recommendations for osteoporosis prevention and treatment based on a review of approximately 1,000 papers (Table 1). While evidence still clearly supports these recommendations, we now recognize that some additional nutrients need consideration (e.g., potassium, vitamin A, vitamin B12). Canada also participated fully in the process of establishing Dietary Reference Intakes (DRIs), based on the Institute of Medicine revision of the American Recommended Dietary Allowances (RDAs). These included consideration of Tolerable Upper Levels of Intake (UL).²⁻⁶ DRIs are distinguished from practice guidelines, which are primarily patient-oriented, by providing public health recommendations for populations and healthy individuals.

This article (adapted from Whiting SJ, Vatanparast H. Nutritional interventions in osteoporosis. *Geriatrics & Aging* 2005;8(9):14-20, with permission from the publisher) aims to reflect our current state of knowledge and present practical recommendations on improving nutrition in people with, or at risk of, osteoporosis. When sufficient evidence-based data are lacking, DRIs²⁻⁶ are used to provide nutrient intake suitable for healthy individuals.

Is calcium and vitamin D emphasis justified?

Calcium from dietary intake is an essential building block of bone. In and of itself, increasing calcium intake has a modest but positive effect on bone mineral density (BMD) in postmenopausal women.⁷ According to the OC guidelines, the typical North American diet does not meet the calcium recommendation of 1500 mg/d for people over age 50 (Table 1), despite the availability of dairy products and some calcium-fortified foods (e.g. fruit juices, some milks and yogurts). Plant-based milk substitutes fortified with calcium are a viable alternative for individuals unable or unwilling to consume cows' milk, but absorption of calcium is lower (70%–90%)⁸ for these products.

Individuals age 50 and older should consider a calcium supplement (usually 500–600 mg/d is sufficient). While there is 20% greater availability of calcium from calcium

citrate compared to calcium carbonate, the difference is within the range defined for “bioequivalency.” Therefore, the choice of supplement should depend mainly on personal preference, including cost and formulation (e.g. tablet vs chewables).¹⁰

A recent meta-analysis has confirmed the OC recommendations (Table 1) on vitamin D.¹¹ Although vitamin D has not gained as much attention as calcium until now, we can expect to see more interest regarding its efficacy in reducing falls and subsequent fractures.¹¹ In the presence of adequate sunlight, dietary intake of vitamin D is not required. In Canadian latitudes, however, sun exposure is often inadequate — in winter as well as during summer months (due to deliberate avoidance/sunscreen use). Dietary sources such as oily fishes and fortified milk or margarine may contribute to serum levels of 25 hydroxy-vitamin D₃ (the circulating and storage form of vitamin D).^{11,12} But diet alone cannot maintain serum hydroxy-vitamin D₃ levels in the range of 70–90 nmol/L now regarded as sufficient for optimal bone health in adults over 50 years. For these people, a daily supplement of 800–1,000 units of vitamin D₃ is recommended.¹

Supplementation with both vitamin D and calcium to forestall postmenopausal osteoporosis in elderly frail, institutionalized adults has been reported to result in fewer hip fractures.¹³ In contrast, two recent studies concluded that this approach was ineffective in the secondary prevention of fractures.^{14,15} They are therefore considered adjuncts to treatment.¹

Lifestyle nutrients: protein, sodium, caffeine

Experimentally, high-protein diets can induce a negative calcium balance by increasing urinary loss of calcium; this can lead to bone loss if calcium absorption is not up-regulated.¹⁶ Sufficient protein is necessary, however,

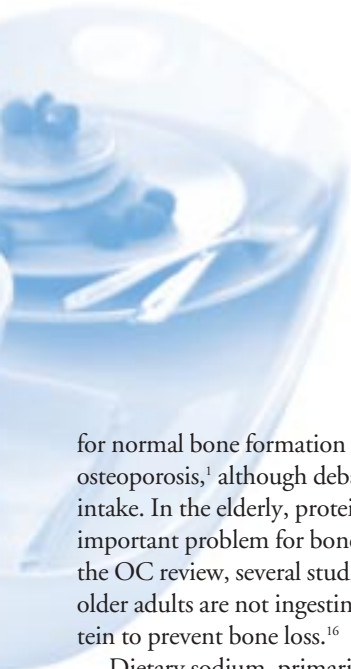


Table 1

Nutrient recommendations from Osteoporosis Canada, 2002 clinical practice guidelines*¹

Nutrient	Recommended daily intakes	Notes
Calcium	Women 19–50 y 1000 mg Men 19–50 y 1000 mg Women over 50 y 1500 mg Men over 50 y 1500 mg	Calcium and vitamin D should not be used as the sole treatment of osteoporosis, but are essential adjuncts to treatment
Vitamin D	Women 19–50 y 400 IU/d Men 19–50 y 400 IU/d Women over 50 y 800 IU/d Men over 50 y 800 IU/d	Vitamin D ₃ is preferred over Vitamin D ₂ . For Canadians, sun exposure does not appear to be sufficient to replace ingested forms of vitamin D.
Protein	Maintaining adequate protein intake is important.	Increasing dietary protein in people with insufficient intake has a positive effect on risk of hip fracture. The recommendation for healthy adults is 0.8g/kg body weight. ⁶
Sodium	Adults should avoid excess dietary sodium (> 2100 mg/d) as it reduces BMD.	Studies that measured sodium intake properly showed a significant negative effect of sodium on BMD in adults.
Vitamin K	Vitamin K is not recommended for the prevention or treatment of postmenopausal osteoporosis.	Vitamin K may be efficacious in treating postmenopausal women with severe osteoporosis, but has not been shown to be superior to calcium and vitamin D. Recommendations for adult men and women are 120 and 90 µg/d. ³
Food Component		
Caffeine	Excess caffeine (> 4 cups coffee/d) should be avoided.	One coffee cup = 237 mL, providing approximately 100 mg caffeine.
Isoflavones	Ipriflavone may be considered a second-line preventive therapy in postmenopausal women but is not recommended for treatment of postmenopausal women with osteoporosis.	Ipriflavone (200 mg, 3 times/d) is an effective preventive therapy to maintain BMD in postmenopausal women.

* See complete OC guidelines, or full article (*Geriatrics & Aging* 2005;8(9):14-20) for explanation of methodology, including grades of recommendation and levels of evidence.

for normal bone formation and to prevent and treat osteoporosis,¹ although debate exists about optimal intake. In the elderly, protein deficiency may be an important problem for bone and general health. Since the OC review, several studies have shown that many older adults are not ingesting sufficient amounts of protein to prevent bone loss.¹⁶

Dietary sodium, primarily as salt, promotes urinary calcium loss when taken in amounts over 2,100 mg (91 mmol)/d.⁵ The recommended DRI is 1,500 mg (65 mmol)/day,⁵ which can be achieved by avoiding salted or processed/packaged foods.

While caffeine has only a small effect on bone health, the 2002 guidelines included a recommendation limiting coffee intake to four cups/d for several reasons:¹ first, because of supporting evidence; second, since many people may have restricted consumption unnecessarily; finally, because the new boutique coffees and energy drinks provide large amounts of caffeine. Drinking tea, however, does not impact greatly on caffeine intake.

Vitamin K and isoflavones

The OC guidelines listed vitamin K and isoflavones as alternative therapies (Table 1).¹ Vitamin K plays a role in the synthesis of bone proteins such as osteocalcin, which is involved in mineralization. Although it may be a promising nutrition therapy showing positive correlation with BMD,¹ no randomized controlled trials have been completed on its efficacy in preventing bone loss or promoting bone mineralization in osteoporosis. The recommended intake is the same as for healthy adults.³ On the contrary, numerous trials of isoflavones give promising indications for their synthetic form, ipriflavone, as a second-line preventive therapy.¹ We still need to determine whether food isoflavones such as soy can also protect against bone loss in postmenopausal women. Short-term trials indicate that as little as 40–60 mg of isoflavones from soy or red clover may produce some protective effect on bone loss.^{17,18}

Other nutrients

The 2002 guidelines committee reviewed some other nutrients, but found no evidence for special consideration. While the essential fatty acids omega-3 and omega-6

may affect bone, no human trials or observational studies have been done. No inhibitory effect of dietary fibre on calcium absorption has been reported.¹

Minerals such as magnesium, iron, zinc, copper, phosphate, boron, strontium and manganese have known functions related to tissue synthesis and in some cases bone formation. Recommended intakes should be met through diet, with supplements added if necessary.

New evidence

Some nutrients and food components not reviewed in 2002 for people at risk of osteoporosis deserve special consideration (Table 2). Prospective population studies

indicate that excess vitamin A (as retinol only, not provitamin A carotenes) causes bone loss and puts older adults at risk of fracture.¹⁹ The Institute of Medicine has set the UL for retinol at 3,000 µg/d, based on the risk of liver damage and birth defects.³ For bone, however, adverse effects may occur at much lower levels,¹⁹ so patients should restrict fish liver oil and avoid supplements containing large amounts of retinol.

Recent studies associate low vitamin B12 intake and/or high levels of serum homocysteine (that may occur with vitamin B12 deficiency) with increased fracture risk.²⁰ As older adults may have insufficient vitamin B12 due to loss of stomach acid, the Institute of Medicine recommends synthetic cobalamin ingestion to ensure adequate absorption.⁴ The impact of such an approach on bone health is, as yet, unexplored.

Potassium supplements that are alkaline (where the anion [negatively-charged particle] is bicarbonate or a precursor to bicarbonate) have been shown to reduce urinary calcium losses.²¹ This effect is attributed to the potassium cation (positively-charged), but most dietary

potassium is derived from fresh fruits and vegetables that also provide bicarbonate equivalents. The Institute of Medicine suggests a high daily potassium intake of 4,700 mg,⁵ partly to offset bone loss caused by a typical Western diet high in salt and low in calcium.

Two lifestyle factors have also been implicated for bone health. First, studies in children demonstrate that cola soft drinks provide phosphoric acid and caffeine which, together, negatively impact on calcium metabolism.²² Soft drinks also often replace milk for North American adolescents, thus reducing calcium intake.²³ Second, cross-sectional or longitudinal studies have linked moderate alcohol consumption (i.e. 7–15 g/d = ½–1 serving/d) with increased BMD,²⁴ but the evidence for this is weak.

DASH: a recommended dietary plan

A variety of nutrients affect bone health. Promoting intake of single nutrients is not the best approach in osteoporosis management, as they occur together in foods. A typical Western diet contains inadequate amounts of calcium, fruits and vegetables, and large quantities of salt that are harmful to overall health, including bone.⁵ The DASH (Dietary Approaches to Stop Hypertension) regimen, emphasizing consumption of fruits, vegetables, low-fat dairy products, whole grains and beans, and avoiding processed foods (Table 3, page 9), fulfills the need for optimal intake of many bone-beneficial nutrients.⁵

- It provides sufficient calcium for adults up to age 50, with supplements advised to meet the higher needs of older individuals.
- Fruits and vegetables afford the optimal amount of alkaline potassium equivalents. They also supply magnesium, vitamin C and other antioxidants important to bone metabolism. Polyphenols found in tea but also in many fruits and vegetables have been positively associated with bone health.²⁵
- This dietary plan ensures a reasonable level of sodium intake without making foods unpalatable.

Although the DASH diet is designed to control hypertension, it has complementary benefits for bone health.²⁶ Followed in conjunction with adequate calcium and vitamin D supplementation, it provides an effective dietary defense against osteoporosis for adults over the age of 50. For people suffering from osteoporosis, these dietary interventions are necessary adjuncts to therapy. ●

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Table 2

Additional nutrients and food components of concern for people with osteoporosis

Nutrient	Consideration	Notes
Vitamin A	Evidence suggests too much retinol in elderly people increases risk of bone loss and fracture.	Tolerable upper level of retinol intake is 3000 µg/d. ³
Vitamin B12	Evidence suggests a deficiency of vitamin B12 predisposes elderly to increased fracture risk.	RDA for persons over 50 years is 2.4 µg/d in synthetic form due to low stomach acid. ⁴
Potassium	A high potassium diet or supplementation with alkali potassium salts improves calcium balance.	Recommendation for people > 14 y is 4700 mg/d. ⁵
Food Component		
Soft drinks	While a concern for adolescents, soft drinks do not play a role in bone gain or loss in adults.	In adolescents, soft drinks replace milk thereby lowering calcium intake; ²³ extreme intakes of phosphoric acid-containing beverages might be a concern for all ages. ²²
Fruit and vegetables	Fruits and vegetables contribute to bone health by providing potassium and alkali, antioxidants, polyphenols, phytoestrogens.	The DASH diet, with recommended 8–10 servings/d of fruit and vegetables, is bone-protective as it provides adequate calcium and potassium while maintaining low sodium. Drinking tea, a source of polyphenols, has been positively associated with bone health. ²⁵
Alcohol	Cross-sectional studies report a beneficial effect of moderate alcohol consumption on BMD in older adults. ²⁴	Moderate intake = 7–15 g/d (i.e. ½–1 serving/d).

Table 3

Dietary Approaches to Stop Hypertension (DASH)

Food groups (Examples of 1 serving)	Minimum servings/d	Approx. calcium intake (not fortified)	Approx. sodium intake	Approx. potassium intake	Approx. protein intake
Milk products Milk, 1% (1 cup) Cheese (50 g)	2	575 mg	720 mg	520 mg	17 g
Grain products Bread (1 slice) Cereal (1 cup) Rice (1 cup)	7	160 mg	950 mg	560 mg	21 g
Vegetable group (Raw leafy vegetable) Lettuce (1 cup) Spinach (1 cup)	4	200 mg	100 mg	970 mg	6 g
Fruit group Banana Orange Orange juice (1/2 cup)	4	95 mg	10 mg	1610 mg	4 g
Meat Lean meat (80 g) Fish (80 g) Poultry (80 g)	2 or less	50 mg	135 mg	550 mg	19 g
Alternatives Egg (1) Cooked dry beans (125 g) Tofu (100 g) Peanut butter (2 tbsp)	0.6 (4 servings/week)	30 mg	35 mg	180 mg	8 g
Total		1110	1950*	4390	75

Note: Institute of Medicine DRIs were used to calculate values.

* Consuming unsalted products reduces sodium intake further.



The VITAMIN D conundrum

Are Canadians getting enough vitamin D to maintain bone health and protect against some cancers? How can individuals get adequate vitamin D without exposing themselves to dangerous levels of ultraviolet radiation through sunlight? At what levels are vitamin D supplements toxic?

Experts met at the North American Conference on UV, Vitamin D and Health on March 8, 2006 in Toronto to discuss these issues. Participants included the Canadian and American Cancer Societies, the Canadian Institutes of Health Research, the Canadian Dermatology Association, the National Cancer Institute of Canada and the World Health Organization. A multi-disciplinary group will continue to work towards identifying research gaps and opportunities and establishing a consensus statement at the end of May.

For now, here are some key messages:

- Vitamin D is essential for bone growth and to maintain normal bone mineralization.
- Many Canadians are likely to be lacking in vitamin D due to insufficient sun exposure and inadequate dietary intake.
- UV radiation causes skin cancer and some eye conditions such as cataracts.
- Excessive sun exposure or vitamin D intake has no increased benefit in health outcomes.
- Until further research is conclusive on the link between sun exposure/vitamin D and cancer, the bottom line is: keep following the Osteoporosis Canada vitamin D recommendations (Table 1, page 7) and wear sunscreen.

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OC renews its commitment with vitamin D research grant

Canadian researchers are world-renowned leaders in the prevention, diagnosis and management of osteoporosis. Osteoporosis Canada (OC) is strengthening its commitment to support the research agenda in Canada through partnerships with established peer-reviewed funding organizations. Together with the Dairy Farmers of Canada, OC is pleased to announce the awarding of a grant to Dr. David Cole and Dr. Reinhold Vieth of the University of Toronto. Their proposal, entitled *Effect of High-dose Vitamin D Therapy on Leptin*

Metabolism: A Mechanistic Probe of the Calcium Intake/Weight Loss Hypothesis, received the highest ranking from the scientific advisory committees, amid strong competition. OC will contribute \$20,000 per year in 2006 and 2007 towards their research.

The scientists will study the effect of high-dose vitamin D on the metabolism of leptin, a hormone which regulates body weight as well as bone turnover. Their goal is to understand how

vitamin D and body weight interact in healthy older humans to protect against osteoporosis.

Dr. David Cole is Professor of Laboratory Medicine and Pathobiology at the University of Toronto, and Director of the Genetics Diagnostics Laboratory at Sunnybrook Health Sciences Centre. His research focuses on the molecular biology of inherited and acquired metabolic bone disease.

Dr. Reinhold Vieth is Professor of Nutritional Sciences

and of Laboratory Medicine and Pathobiology at the University of Toronto. He is Director of the Bone and Mineral Laboratory at Mount Sinai Hospital. A consultant with OC's Scientific Advisory Council, Dr. Vieth is an expert in the toxicology and clinical nutrition of vitamin D.

For information on other grants available through the OC research program, go to "Research" on the section "For Health Professionals" of their website (www.osteoporosis.ca). ●



Dr. David Cole



Dr. Reinhold Vieth

Case study

Continued from page 5

People with MS have low 25 hydroxyvitamin D (25OHD) levels (Cosman, 1998; Nieves, 1994). Mahon et al (*J Neuroimmunol* 2003; 134:128-32) reported that nearly 50% of patients are vitamin D-insufficient (25OHD < 50 nmol/L). Although there is no consensus, most experts agree that the normal range for 25OHD should be higher than 70–80 nmol/L (Dawson-Hughes B et al. *Osteoporos Int* 2005;16:713-16).

Management

Given the many links between MS and fractures, it is reasonable to obtain a BMD measurement for Mrs. S. B. at this time. Since disabled MS patients may be particularly ill-equipped to cope with the additional burden of even the most minor fracture, the goal is to identify, and decrease, her overall risk of this occurrence.

In addition to BMD testing, I would recommend that Mrs. S. B. optimize her calcium and vitamin D intake. Daily vitamin D consumption of at least 800 IU has been associated with fewer falls (Bischoff HA et al. *J Bone Miner Res* 2003;18:343-51; Kiel DP et al.

J Bone Miner Res 2004;19[Suppl1]: S462-S463). I also want to ensure that she has a well-balanced diet with sufficient protein and at least five servings of fruits and vegetables a day, as this will provide other nutrients important for bone health. I would want to keep her as mobile as possible, while making sure that her risk for falls is minimized. The decision to start an antiresorptive agent will depend partly on her BMD results.

Unfortunately, the management of acute complications and exacerbations of MS often takes precedence over preventive healthcare. According to a study by Shabas and Weinreb (*J Womens Health Gen Based Med* 2000;9:389-95), 81% of postmenopausal women with MS had not had a BMD test (often despite obvious risk factors such as loss of mobility and corticosteroid use), 50% of them were not taking extra calcium, and 73% did not take vitamin D supplements.

In summary, MS patients are at higher risk for fragility fractures as a result of impaired mobility, greater risk of falls, low vitamin D levels and some drugs used in their management. Let's make sure that we don't forget bone health in these patients! ●



Osteoporosis Canada

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June 2–6 2006

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Attend the leading global congress on osteoporosis, organized by the International Osteoporosis Foundation in cooperation with Osteoporosis Canada.

Broad scientific program for research scientists, practitioners and other clinical health professionals

Plenary lectures, oral presentation of abstracts, Meet the Expert sessions, poster sessions and satellite symposia

Allied Health Professionals Day, Sunday June 4, chaired by Dr. Anthony Hodsmen & Dr. Alexandra Papaioannou

For information and to register:

IOF Congress Secretariat

Fax: +33 4 72 36 90 52

info@osteofound.org; www.osteofound.org/wco/2006

HIGHLIGHTS FROM THE IOF WORLD CONGRESS

June 7, 2006

BMO Financial Group Institute for Learning, Toronto, ON

6:00–9:00 pm (dinner 6:00–7:00 pm)

Family physicians and other community healthcare professionals who are unable to attend the IOF World Congress are invited to participate in an evening symposium, presented by a nationally recognized faculty.

For free registration (includes dinner and parking):

Ellen Hunter

Tel: 1-800-463-6842 ext. 239; Fax: 416-696-2673

ehunter@osteoporosis.ca

ENDOCRINE UPDATE 2006

June 16, 2006

St. Joseph's Healthcare, Academic Centre, Hamilton, ON

8:00 am – 5:00 pm

A CME day from the Division of Endocrinology and Metabolism at McMaster University and the University of Western Ontario for endocrinologists, internal medicine and surgical specialists, and family physicians. State of the art lectures by nationally recognized faculty on the diagnosis and management of common endocrine diseases.

For information on accreditation and to register free-of-charge:

Rose Galano

Tel: 905-525-9140 ext. 22671; Fax: 905-572-7099

galanor@mcmaster.ca

about Osteoporosis Canada

Osteoporosis Canada is a national, not-for-profit organization dedicated to educating, empowering and supporting individuals and communities in the prevention and treatment of osteoporosis.

The organization, guided by its Scientific Advisory Council (SAC) made up of osteoporosis experts from across the country, works with healthcare professionals to make the latest prevention, diagnostic and treatment options available to Canadians.

www.osteoporosis.ca