



Osteoporosis Canada

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# osteoporosis

**update**

a practical guide  
for Canadian physicians

## Focus on long-term care

Strategies to reduce  
tragic falls and fractures  
in the frail elderly

### special feature

Bone health recommendations  
for women using Depo-Provera<sup>®</sup>

### perspective

Report card on access to BMD testing  
and medications

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# Timeliness is of the essence



**Sid Feldman**, MD, CCFP, FCFP is Chief, Department of Family and Community Medicine, Baycrest Geriatric Health Care System and Assistant Professor and Director of the Care of the Elderly Program, Department of Family and Community Medicine, University of Toronto.

I have worked as a long-term care and community family physician for almost 20 years. One of my patients, Mrs. S., is an 87-year-old, cognitively intact woman with severe osteoporosis. Her T-score is below  $-5.0$  and she has suffered multiple fractures. Due to her chronic pain, she requires medications that put her at increased risk of delirium, future falls and fractures. Her severe kyphosis makes it impossible for her to raise her head high enough to look into the faces of her grandchildren when they come to visit, unless they sit down. Her pain has led to bouts of depression. If only she had received aggressive treatment earlier in her disease, life might be very different for her.

Up to 95% of women and 51% of men in long-term care facilities have osteoporosis. Residents who suffer a hip fracture are less likely to regain function than their home-dwelling peers, and are twice as likely to die within 3 months as those without fracture. In spite of these compelling statistics, osteoporosis remains seriously underdiagnosed and undertreated in the nursing home setting. The deterrents to treatment are multifactorial, including costs, side effects, polypharmacy and patient reluctance. One of the main reasons physicians do not prescribe bisphosphonates for these individuals stems from the belief that patients may die before they are likely to achieve any benefits. In fact, bisphosphonates may lead to BMD and fracture benefits within 6 months, and the mean life expectancy of residents in Canadian nursing homes is 2.5 years.

The feature article in this issue looks at barriers to appropriate management of this population and ways to narrow this care gap. In general, the benefits of treatment outweigh the risks and will surely result in improved quality of life for our frail elderly patients.

A special feature by Dr. Christine Derzko updates us on the bone effects of depot medroxyprogesterone acetate in women, especially adolescents and perimenopausal women. In response to major concerns of healthcare providers about BMD loss with this highly effective contraceptive agent, Dr. Derzko cites the recommendations of the World Health Organization, Society of Obstetricians and Gynaecologists of Canada and American Academy of Pediatrics.

Also in this issue, Osteoporosis Canada is proud to present a summary of the results of their nation-wide research on access to publicly funded BMD testing and osteoporosis medications. Unfortunately, the picture is not that rosy. With their first national report card, Osteoporosis Canada calls on provincial and federal governments to work together to implement a coordinated strategy to improve osteoporosis care and reduce debilitating fractures for all Canadians.

The Scientific Advisory Council (SAC) welcomes your comments and questions on these and other topics of interest to you. Please send correspondence to osteo@parkpub.com.



# Osteoporosis Canada's national report card reveals unmet needs

**T**he statistics are startling: 1 in 4 women and at least 1 in 8 men over the age of 50 have osteoporosis, and as many as 2 million Canadians may be at risk for osteoporotic fractures during their lifetime.<sup>1</sup> Osteoporosis and the fractures it causes cost the health-care system in excess of \$1.3 billion each year based on 1993 data.<sup>2</sup> *Breaking Barriers, Not Bones*, a new report released by Osteoporosis Canada in November 2008, reveals solid evidence that our publicly funded healthcare system is failing large numbers of Canadians who suffer painful wrist, spine and hip fractures as a result of osteoporosis. The full report is available at [www.osteoporosis.ca](http://www.osteoporosis.ca) — here, we present a summary of the key findings and recommendations.

Over 80% of all fractures in people over age 60 are osteoporosis-related.<sup>2</sup> But numbers don't tell the full story. For the individuals who suffer fractures, the stories are personal ones. Moreover, they illustrate the prevalence of this debilitating condition and dispel the misconception that it is just an "old woman's" disease. Pain, disability, reduced mobility and long-term disability resulting from osteoporosis are all too frequent and can occur in both males and females of varying ages. Additionally, hip fractures result in death in up to 30% of cases.<sup>3-5</sup> *Breaking Barriers, Not Bones* includes real-life stories of people living with osteoporosis, which provide compelling examples of the impact of this chronic disease.

Osteoporosis Canada is committed to its goal of helping individuals reduce their risk of osteoporosis and ensuring that all Canadians have access to the best diagnosis and treatment. Our national report looks at the two components that are critical to achieving this goal: access to bone mineral density (BMD) testing and access to medications. *Breaking Barriers, Not Bones* provides a measure of how well Canadians are able to obtain these two elements through the publicly funded healthcare system, and also gives a benchmark to measure future progress.

*Breaking Barriers, Not Bones* is the first large-scale national report card of its kind to assess and grade Canadians' access to BMD testing and osteoporosis medications on provincial/territorial drug benefit plans across the country. In addition, the report examines provincial activity in the field of osteoporosis care. The Report Card Committee evaluated information and data provided by the provinces and territories, and summarized it to present a cross-country picture of government initiatives.

Our research reveals that access to BMD testing across the country is far from adequate — only a small percentage

of Canadians who are at risk are being referred. Availability of drug treatments that can help prevent fractures varies across the country as well. In some provinces, individuals have restricted access to effective treatment options unless they pay for them themselves. With the aid of this first national report, Osteoporosis Canada is calling on the provincial and federal governments to help establish a national strategy, and parallel provincial/territorial strategies, to provide coordinated osteoporosis care and reduce debilitating fractures. *Breaking Barriers, Not Bones* is our opportunity to partner with governments at the federal and provincial/territorial levels to develop and implement strategies leading to improved bone health for all Canadians.

## Key findings

- Analysis of the data on current rates of BMD testing across the country indicates that access is far from adequate, despite the existence of guidelines for identifying those who should be tested (see next page). The grades ranged from 2 Bs (Alberta, Ontario); 1 C (British Columbia); 6 Ds (Québec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, Northwest Territories); followed by 2 failing grades of F (Saskatchewan, Manitoba).
- An assessment of the availability of osteoporosis medications on provincial/territorial public drug plans yielded grades that ranged significantly, from 1 A (Québec); 2 Bs (Ontario and Yukon); 6 Cs (Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, Newfoundland and Labrador); a C minus (British Columbia); to a failing grade of F (Prince Edward Island) (see page 4).

## Medical necessity vs geography

Osteoporosis care must be guided by medical necessity, not geography. Ensuring that adequate care is available to Canadians regardless of where they live must be a priority. Further, the gap between what is appropriate access to publicly funded BMD testing and medications and what is currently available must be addressed. In the long term, however, improving patient outcomes and reducing the impact of osteoporosis will require a more comprehensive approach within the healthcare system.

## Action is required

We recommend that:

- The federal and provincial/territorial governments work collaboratively to create a national osteoporosis strategy, supported by parallel provincial/territorial strategies.

## In the long term, improving patient outcomes and reducing the impact of osteoporosis will require a more comprehensive approach within the healthcare system

- The strategies ensure that current and future initiatives in risk reduction, diagnosis and treatment are coordinated, evidence-based, comprehensive and appropriately resourced within the publicly funded system, and that they achieve the ultimate goal of reducing the impact of debilitating fractures on individuals and the healthcare system.
- Osteoporosis Canada work in partnership with the federal and provincial/territorial governments to develop and implement comprehensive and integrated strategies. ●

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### Access to osteoporosis medications

PROVINCE/TERRITORY	GRADE
BRITISH COLUMBIA	C-
ALBERTA	C
SASKATCHEWAN	C
MANITOBA	C
ONTARIO	B
QUEBEC	A
NEW BRUNSWICK	C
NOVA SCOTIA	C
PRINCE EDWARD ISLAND	F
NEWFOUNDLAND AND LABRADOR	C
YUKON	B

Information was requested but not available from Nunavut and Northwest Territories.

The results for medication access on provincial/territorial public drug plans were better than those for BMD access.

Individuals must have access to a range of therapies to ensure effective treatment. Our research demonstrates that while some provinces are doing very well, many others are simply not providing this access to individuals with osteoporosis in their jurisdiction.

## Grading

Provinces are not providing adequate access to BMD testing — most received a grade of C or lower.

BMD testing is an important diagnostic tool to assist individuals and healthcare providers to manage and treat osteoporosis. Additionally, once an individual has been accurately diagnosed and is receiving appropriate treatment, their likelihood of sustaining a future fracture decreases.

### Access to BMD testing

PROVINCE/TERRITORY	GRADE	RATE/1000 POPULATION 65 AND OVER
BRITISH COLUMBIA	C	222
ALBERTA	B	335
SASKATCHEWAN	F	95
MANITOBA	F	59
ONTARIO	B	317
QUEBEC	D	166
NEW BRUNSWICK	D	178
NOVA SCOTIA	D	144
PRINCE EDWARD ISLAND	D	137
NEWFOUNDLAND AND LABRADOR	D	188
NORTHWEST TERRITORIES	D	189

Information was requested but not available from Nunavut and Yukon.

# Long-term care residents

## How can we improve osteoporosis care and reduce fractures?



**O**steoporosis and osteoporotic fractures are much more common among residents of long-term care (LTC) institutions than among community-dwelling seniors. Yet many of these patients are never assessed for osteoporosis, either before or after entering the facility, and may not receive appropriate treatment even when it is clearly indicated. Pinpointing the reasons for this care gap is vital to ensure appropriate management of nursing home residents in order to reduce the tragic consequences of fracture in this frail population.

Up to 95% of women and 27% to 51% of men in this setting have osteoporosis.<sup>1,2</sup> The incidence of hip fractures, the most serious complication of osteoporosis, is about 6% per year, 4-fold higher in LTC facilities (age- and sex-adjusted)<sup>3</sup> than in the community. One-third of all hip fractures occur in these institutions.<sup>4</sup> Patients in nursing homes suffering a hip fracture are twice as likely to die within 3 months as those without fracture, matched for age, sex and function.<sup>5</sup> Residents of LTC facilities are less likely to regain function after a hip fracture than their peers in the community, even after controlling for their older age, lower baseline function, more comorbidities and higher rate of dementia. After 6 months, 71% of independent seniors are back to their previous level of function, compared to only 22% of nursing home patients, with the greatest negative impact on walking and transfers (e.g. in/out of bed or wheelchair, on/off toilet).<sup>6</sup>

### Barriers to diagnosis and treatment

Despite these alarming statistics, real-world diagnosis and treatment of osteoporosis in the LTC setting is rare. In a Canadian chart review, only 14% of newly admitted LTC residents could be identified as osteoporotic (8% specifically diagnosed on chart and 6% with a hip fracture), and just 39% of these diagnosed patients were on any osteoporosis therapy.<sup>7</sup> A survey of Canadian nursing home physicians reveals that while they estimate about 50% of their patients have osteoporosis, half do not routinely assess for the disease and one-quarter admit they do not usually treat it.<sup>8</sup> In fact, less than 12% of Canadian LTC residents are actually receiving osteoporosis-related treatments, primarily multivitamins or calcium.<sup>4</sup> Deterrents cited by physicians include:<sup>8</sup>

- costs of diagnosis and treatment

- belief that treatments are futile (due to patient age) or of unproven effectiveness in this population
- side effects of treatment
- polypharmacy
- patient reluctance to be treated

### Which patients are most at risk?

In addition to traditional osteoporosis risk factors,<sup>9</sup> defining factors that are most relevant to the LTC setting may help staff more easily identify patients who warrant further evaluation and treatment (Table 1).<sup>10</sup>

Age roughly doubles the 10-year probability of fractures between 65 and 85 years, from 6% to 13% for men and 14% to 27% for women.<sup>9</sup> Those  $\geq 85$  years currently make up 46% of institutionalized seniors and are the fastest-growing segment of the nursing home population.<sup>11</sup> Consequently, resident age should assume increasing importance in osteoporosis risk assessment.

Tendency to fall is another major fracture risk factor.<sup>9</sup> Cognitive impairment, in turn, is an independent risk factor for falls, often associated with hip and other fractures.<sup>12</sup> Of interest, a Canadian study found that institutionalized seniors with Alzheimer's disease have about 2-fold higher odds of hip fractures, independently of whether or not they fall.<sup>13</sup>

Several easily measurable clinical risk factors — age, fracture after age 50, maternal hip fracture after age 50, weight  $< 57$  kg, smoking, using arms to stand up from a chair — and BMD have been compared for their ability to predict new fractures in postmenopausal women. Overall, being unable to rise from a chair without using one's arms was the strongest predictor of new hip fractures, raising the odds 3.6-fold, whereas osteoporotic BMD conferred an odds ratio of 1.7. Assessing for this risk factor could be conveniently incorporated into routine clinical practice in LTC, particularly when BMD testing is unfeasible.<sup>14</sup>

The relation between function and fractures is complex. In a study of ambulatory nursing home residents, impaired mobility was a strong predictor of hip fracture.<sup>15</sup> Other investigators found that LTC residents who can transfer independently are significantly more likely to have fractures, presumably due to increased opportunities for falls; in addition, transfer independence was synergistic with low

BMD.<sup>16</sup> Similarly, a multivariate analysis concluded that healthier, more mobile and functionally independent residents are most likely to sustain fractures.<sup>17</sup>

Low vitamin D may also be an important factor. One Canadian study found that 9% of LTC patients were severely vitamin D-deficient (< 25 nmol/L) in the autumn months; the deficiency rose to 18% in the spring due to lack of winter sun exposure and, over the same period, the prevalence of hypovitaminosis D (< 40 nmol/L) increased from 38% to 60%.<sup>18</sup> Among LTC residents with hip fractures, the mean vitamin D level in a Swiss study was 25 nmol/L,<sup>19</sup> while 61% of Finnish patients had hypovitaminosis D.<sup>20</sup>

### Improving detection

Ideally, all LTC residents  $\geq$  65 years old would undergo BMD testing as recommended by the 2002 Osteoporosis Canada (OC) guidelines.<sup>9</sup> Central (hip and spine) dual-energy x-ray absorptiometry (DXA), the gold standard for BMD assessment, is usually limited to hospitals in larger cities, requiring that patients be transported from their residences — not always feasible for those in remote or sparsely populated areas.<sup>29</sup> In addition, positioning frail older patients in the machines may be difficult or uncomfortable, especially if they have poor mobility or cognitive impairment.<sup>2</sup>

Portable devices such as peripheral DXA and quantitative ultrasound (QUS) may be appealing alternatives. Validated heel QUS devices can predict hip, vertebral and overall fractures in both men and women over 65, while peripheral DXA can be used to assess vertebral and global fracture risk in women only (though it is a weaker predictor than central DXA and heel QUS). Neither technique should be used to monitor treatment effects, and their T-scores cannot be considered equivalent to DXA T-scores.<sup>21</sup>

Increasing interest has focused on developing approaches to determine an individual's absolute fracture risk. The 2005 Canadian BMD reporting guidelines recommend a method for determining 10-year absolute risk based on a patient's T-score, age, sex, fracture history and glucocorticoid use. People would thus fall into 1 of 3 risk categories according to their 10-year fracture risk: low (< 10%), moderate (10% to 20%) or high (> 20%).<sup>22</sup> Using this approach, a substantially larger proportion of women over 60 are considered at high risk for fractures than if T-scores alone are used. This agrees with cohort data showing that most women with fractures do not have osteoporotic T-scores.<sup>23</sup>

### Nonpharmacologic interventions

Calcium and vitamin D are essential adjuncts to osteoporosis treatment for all patients. For men and women over 50, OC recommends calcium 1500 mg/day and vitamin D at least 800 IU/day from all sources (diet and supplements).<sup>9</sup> A meta-analysis showed that this level of vitamin D not only reduces the relative risk of hip fractures

## A study showed that inability to rise from a chair without using one's arms was the strongest predictor of new hip fractures — assessment for this risk factor could be easily incorporated into routine clinical practice in LTC

by 26% vs calcium or placebo, but also of falls by 22%, probably due to improved muscle growth and function.<sup>24</sup> Supplements are likely essential: 70% of patients in 3 Canadian LTC facilities are unable to get adequate vitamin D from diet alone.<sup>25</sup> Serum vitamin D testing is not necessary unless the osteoporosis is severe or unresponsive to treatment.<sup>10</sup>

Exercise is another universally beneficial intervention. OC recommends individually tailored exercise programs to increase strength and balance in all seniors who have fallen or are at risk of falling.<sup>9</sup> There is strong evidence that such programs also reduce fall risk factors in LTC residents, though most studies did not look at actual fall or fracture outcomes.<sup>26</sup>

The benefits of hip protectors are still controversial. Hard-shell hip protectors are designed to direct force away from the greater trochanter, whereas soft padding models absorb the impact.<sup>27</sup> A 2006 Cochrane review concluded that these devices are ineffective in community-dwelling seniors and of uncertain effectiveness in institutions, although study design flaws, use of different hip protectors between studies and poor adherence to the use of the devices may have influenced results.<sup>28</sup> In contrast, another meta-analysis restricted to trials in nursing home residents determined that hip protectors do reduce the risk of fractures in this population.<sup>29</sup>

## Table 1. Treatment decision-making in LTC

### Indications for treatment

- Osteoporosis risk factors without BMD data
- BMD-diagnosed osteoporosis
- Previous or new fragility fractures

### Patient considerations

- Cognitive and nutritional status
- Fall and fracture risks: implement fall prevention measures as needed
- Mobility: do not treat if bedridden (unless there is a risk of frequent falls from bed)
- Comorbidities
- Medications: polypharmacy (use of > 4 drugs) does not rule out osteoporosis treatment if all medications are appropriately prescribed
- Preferences of patient or proxy decision-maker

Adapted from: Duque G et al. *J Am Med Dir Assoc* 2006;7:435-41.

A more recent trial has cast doubt on the benefits of hip protectors, even in the LTC setting. It randomized over 1000 nursing home residents to wear a hip protector on either the right or left side, with the unprotected hip serving as the control. The trial was stopped after 20 months because fracture rates were no different between sides, even though adherence was relatively high (74%).<sup>30</sup>

Physical restraints such as special chairs, bedrails, belts and wheelchairs are often used with patients suffering from dementia in an attempt to protect them against falls and fractures. Several studies, however, have found evidence that these devices may in fact increase falls, related injuries and deaths.<sup>31</sup> Other risks include agitation, infections and deconditioning, which can make falls more likely. In contrast, restraint-removal programs can be implemented without increasing adverse events in residents, psychotropic medication use or staffing demands.<sup>32</sup> Consequently, the Alzheimer Society of Canada states that the care strategy of choice is to use no restraints, with minimal restraints to be considered only after exhausting all other options.<sup>33</sup>

## The average length of stay in Canadian LTC facilities is 2.5 years, while BMD and fracture benefits of bisphosphonates may emerge in as little as 6 months

### Pharmacotherapy

After ensuring adequate intake of calcium and vitamin D, bisphosphonates are the current mainstay of osteoporosis treatment, but only one study has been done specifically in the LTC setting. A trial of alendronate in institutionalized elderly women shows that it significantly increases hip and spine BMD, with a trend to fewer fractures; side effects, including upper gastrointestinal (GI) events, are similar to placebo.<sup>34</sup> Risedronate has been assessed for safety and efficacy in women 80 years and older: the number needed to treat is 12 to prevent 1 new vertebral fracture after 1 year, with safety comparable to placebo.<sup>35</sup>

While oral bisphosphonates are generally well tolerated, patients are advised not to lie down for at least 30 minutes after taking them to prevent GI adverse events. These agents should be used with caution or are contraindicated in people who have swallowing disorders, are at increased risk for aspiration, or cannot stay upright for that amount of time. Also, they are poorly absorbed, so must be taken with tap water on an empty stomach. The recently approved (soon available) risedronate 150 mg once-a-month dosing might facilitate adherence to and persistence with oral bisphosphonate treatment. However, nonambulation, cognitive impairment and polypharmacy, all common in the LTC setting, may pose a further challenge for these strict dosing requirements. For such patients, once-yearly intravenous zoledronic acid may minimize the risk of GI side effects and possibly improve adherence.<sup>36</sup> Zoledronic acid reduces vertebral, hip and nonvertebral fractures.<sup>37</sup> In patients who have had a hip fracture, the drug prevents new clinical fractures and lowers all-cause mortality — an effect not seen with other bisphosphonates to date.<sup>38</sup>

Strictly based on efficacy, parathyroid hormone (PTH), or the synthetic analog teriparatide, should be a first-line option for women  $\geq 65$  with numerous vertebral fractures and T-score  $\leq -2.5$ . But since teriparatide is expensive and not on most provincial formularies, it is recommended for use only in the most severe cases, such as women with  $> 1$  fragility fracture and T-score  $\leq -3.5$ .<sup>39</sup> Teriparatide has not been studied in older populations, and it is not currently recommended for use in LTC residents.<sup>10</sup>

### Closing the gap

Given the high medical and economic costs of fractures, healthcare professionals must be more vigilant for osteoporosis in both independent and institutionalized seniors — all at high risk due to their age.<sup>9,10</sup> The challenges of testing BMD in nursing home residents put the onus on physicians to screen older people before admission; proper diagnosis and treatment of osteoporosis at this stage could also keep them in the community longer by avoiding disabling hip fractures. Meanwhile, patients in either setting with fractures or multiple risk factors may be treated even without BMD information. A number of interventions have proven safe and effective in the LTC setting. Patient life expectancy need not be a deterrent to treatment: the average length of stay in Canadian LTC facilities is 2.5 years, while BMD and fracture benefits of bisphosphonates may emerge in as little as 6 months. While treatment decisions should be based on individual patient considerations, the benefits generally outweigh the risks.<sup>10</sup> ●

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## Table 2. Treatment recommendations in LTC

- Calcium 1500 mg/day and vitamin D at least 800 IU/day
- Individually tailored exercise programs to increase strength and balance
- Hip protectors for those willing to wear them
- First-line antiresorptives: bisphosphonates
- Second-line antiresorptives:
  - women: selective estrogen receptor modulators
  - calcitonin
- For pain due to acute vertebral fractures: calcitonin
- Anabolic agents: teriparatide — not yet recommended in LTC setting

Adapted from: Duque G et al. *J Am Med Dir Assoc* 2006;7:435-41. Brown JP, Josse RG et al. *CMAJ* 2002;167(10 suppl):S1-S34.

References continued on page 9

# Depot medroxyprogesterone acetate: update on bone effects

By Christine M. Derzko, MD, FRCSC

**Christine M. Derzko, MD, FRCSC**, is Associate Professor of Obstetrics & Gynecology and Internal Medicine (Endocrinology) at St. Michael's Hospital, University of Toronto.

**D**epot medroxyprogesterone acetate (DMPA) (Depo-Provera®), a long acting progestin given intramuscularly every 3 months, is used for contraception by 2% of Canadian women. In extensive worldwide use over the last several decades, it has earned the reputation of being a convenient, relatively low cost, highly effective, reversible contraceptive without the estrogen-related risks or adverse effects associated with estrogen-containing preparations. It is safe and effective for nursing women and may also be an appropriate option for many women with relative or absolute contraindications to estrogens, for example: women over age 35 years who smoke, hypertensive women or those with focal migraine (migraine with aura) headaches. There appears to be no increase in venous thromboembolism or cerebrovascular accidents associated with its use.

DMPA-induced amenorrhea, once considered problematic, is now an outcome sought by many women, particularly those with troubles related to menses. It is achieved by the end of the first year in 55%–60% of users. Non-contraceptive benefits and uses include protection against endometrial carcinoma, less anemia and a reduction in dysmenorrhea, PMS, endometriosis and chronic pelvic pain, as well as fewer seizures and possibly lower risk of sickle cell crisis and pelvic inflammatory disease. On the negative side, while on average menstrual function resumes within 9 months, the hypothalamic/pituitary suppression and amenorrhea may persist for 18 months or longer. This is unlikely to be a problem for the adolescent user, but may be of significant concern for the adult woman intending to conceive. In addition to menstrual irregularities, other side effects may include headaches, nausea, mastalgia (breast pain), decreased libido, possible mood changes and a reported mean weight gain of 2.5 kg in the first year of use.

## Bone loss

The major concern for many healthcare providers as well as patients has been the reported bone mineral density (BMD) decrease in DMPA users, prompting advisory warnings from the US Food and Drug Administration (November 2004) and Health Canada (June 2005). Several notable reports addressing this issue have recently been released:

1. World Health Organization (WHO) statement on hormonal contraception and bone health. *WHO Epidemiological Record* 2005;35:297-304.
2. Society of Obstetricians and Gynaecologists of Canada (SOGC) Clinical practice guidelines: Canadian con-

- traception consensus — Update on depot medroxyprogesterone acetate. *JOGC* 2006;28(4): 305-8.
  3. Policy Statement of the American Academy of Pediatrics, Committee on Adolescence: Contraception and adolescents. *Pediatrics* 2007;120(5):1135-48.
  4. Lopez LM, Grimes DA, Schulz KF, Curtis KM. Steroidal contraceptives: effect on bone fractures in women. *Cochrane Database Syst Rev* 2006 Oct. 18;(4):CD006033.
- The sidebar on page 9 outlines the recommendations presented in these reports.

Prospective studies have shown that the reduction of BMD is proportional to the duration of DMPA use. By 5 years, bone loss averages approximately 5%–6% at both the hip and the lumbar spine, similar to that which occurs with lactation. The decrease is greatest in the first 2 years, then continues at a slower rate (Depo-Provera Product Monograph, Pfizer Canada Inc. July 2006). DMPA suppresses circulating estradiol levels; this estrogen deficiency is believed to be the major mechanism leading to bone loss. While 2 studies showed that supplemental estrogen therapy mitigated the loss and normalized markers of bone resorption (Cundy T, Ames R, Horne A et al. A randomized controlled trial of estrogen replacement therapy in long-term users of depot medroxyprogesterone acetate. *J Clin Endocrinol Metab* 2003;88:78-81; Cromer BA, Lazebnik R, Rome E et al. Double-blinded randomized controlled trial of estrogen supplementation in adolescent girls who receive depot medroxyprogesterone acetate for contraception. *Am J Obstet Gynecol* 2005;192:42-7), neither the required dose of estrogen nor the optimal regimen has been established. More data are needed before this treatment can be generally recommended.

The BMD decrease appears to be temporary and recovery begins promptly once DMPA treatment is discontinued, but we still do not know if a return of BMD to baseline, pre-DMPA, levels can be expected. While there is no evidence that former DMPA users develop osteoporosis, the important question remains whether or not the reported BMD reduction in women on DMPA therapy is indeed a harbinger of osteoporosis and increased future fractures. To date, there are no randomized controlled trials of DMPA with fractures as an endpoint.

## Age groups requiring special consideration

Current opinion holds that use of DMPA by women aged 18–45 years is safe. However, 2 age groups of women may need special consideration with respect to DMPA-

related bone loss: the adolescent patient and possibly the perimenopausal woman.

- Adolescent bone metabolism is as yet incompletely understood. The drive to achieve peak bone mass makes the process unique and different from that in adult women, as a variety of hormones as well as growth factors are involved. Whether or not adolescents who have not yet achieved their peak bone mass are particularly

## Summary of recommendations

Recent reports from the WHO, SOGC, American Academy of Pediatrics and Cochrane Library (cited on page 8) contain the following recommendations:

- DMPA should be included in the contraceptive armamentarium, as it provides an important option for reproductive age women. Its use in eligible women aged 18–45 years should be unrestricted, with no limitations on duration of use.
- In adolescents and perimenopausal women, DMPA may also be an appropriate contraceptive choice, but the decision to use it should include a specific assessment of the individual and a review of applicable risks and benefits, with consideration of the drug's effects on bone metabolism.
- All women should be counselled on bone health measures, including the importance of:
  - an adequate intake of calcium and vitamin D (through diet and supplements)
  - a program of weight-bearing exercise
  - smoking cessation
  - limiting alcohol and caffeine intake
- Current evidence does not support routine BMD testing for all DMPA users. However, consideration should be given to obtaining a BMD in women with additional risk factors for osteoporosis, such as low body weight (< 57 kg), personal history of low-trauma fracture, family history of hip fracture or osteoporosis, and evidence for extended menstrual cycle interruption (e.g. exercise-induced amenorrhea, history of anorexia nervosa).

susceptible to the BMD effects of DMPA-induced hypoestrogenism is not clear. And, despite the fact that rapid recovery of BMD occurs when DMPA is discontinued, the possibility has been raised that adolescents may not attain their predestined peak bone mass because of DMPA-induced microarchitectural changes in the bones. To date, there is no evidence that this is so.

- Concerns have been raised also about perimenopausal DMPA use. When DMPA is discontinued just prior to menopause, there may not be enough time with adequate circulating estrogen levels to allow optimal BMD recovery. As a result, women may then enter the rapid bone loss phase of early menopause with a lower BMD, potentially increasing their future fracture risk.

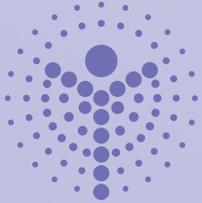
### Risks and benefits

DMPA has proven over decades of worldwide use to be a highly effective, convenient, well-tolerated and low-cost treatment, particularly as a contraceptive agent. As with all medications, there are pros and cons associated with it. A decision whether or not to take DMPA should involve a consideration of benefits as well as risks, including concerns about potential bone loss. It is important to recognize that, in the average woman, the anticipated decrease in BMD with DMPA is not severe. Further, significant and rapid recovery of BMD occurs when treatment is discontinued. Thus, fears of bone loss should not recommend against DMPA use.

A balanced discussion with the patient of the risks and benefits should precede initiation of therapy and be repeated annually, particularly in the long-term user. The importance of bone health measures should be emphasized. Finally, low-dose estrogen supplementation may reduce the secondary bone loss associated with the use of this drug, but more studies are needed to confirm this finding and establish the optimal dose and regimen. ●

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Osteoporosis Canada

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## about Osteoporosis Canada

Osteoporosis Canada is a national, not-for-profit organization dedicated to educating, empowering and supporting individuals and communities in the risk reduction 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](http://www.osteoporosis.ca)

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