



A Pocket Guide for Family Physicians

Management of Osteoporosis



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Several of the most common questions regarding osteoporosis management include:

- Who do we treat for osteoporosis?
- When do we provide osteoporosis treatment?
- What therapy should be used for osteoporosis treatment?
- How long should a patient be given osteoporosis therapy?
- How do we monitor osteoporosis therapy?
- How do we manage men with osteoporosis?

Among the numerous osteoporosis risk factors, there is general agreement that four are of particular importance: advanced age, personal history of fragile fracture, family history of fragile fracture, and low bone mineral density (BMD) measurements, as assessed by central dual energy x-ray absorptiometry (DXA of the spine and/or hip).¹

While these factors are the major risk factors, a complete history should also include information regarding: history of smoking, use of glucocorticoids, comorbidities, other medications that impair normal bone metabolism, intake of calcium and vitamin D, regular physical activity, and alcohol abuse.¹

Physical examination is an important tool for the management of osteoporosis and should include: measurement of height and mass, iliocostal distance

Case Study: Four Generations

Clara is a 90-year-old woman who suffered a hip fracture last year. She has a daughter, Carol, who is 62-years-old and has no history of fracture. Carol's daughter Shelley is 40-years-old and also has no history of fracture. Lastly, Jessica, Shelley's daughter, is a healthy, young, eight-year-old girl.

Advice for basic osteoporosis management for the family members includes osteoporosis assessment and initiation of anti-fracture therapy for Clara, and osteoporosis risk assessment and appropriate management for Carol (chances for treatment are high). If Shelley is premenopausal and no other significant osteoporosis risk factors exist, proper calcium intake, vitamin D and physical activity are advised. Lastly, Jessica should be provided the same information as her mother and should be made aware of the importance of good bone hygiene during the growing years.

(number of centimeters between the costal margin and pelvic ridge in the mid-axillary line, assessed when the patient is standing), assessment of kyphosis, and assessment of skeletal frame (strong, medium, tiny).^{2,3}

In cases of suspected osteoporosis, laboratory tests should be undertaken to exclude the presence of osteoporosis secondary to other medical conditions (e.g., hyperparathyroidism). Tests to undertake include: CBC, alkaline phosphatase, calcium, phosphate, protein electrophoresis, TSH, creatinine

clearance, C-reactive protein, and in some cases, 25-hydroxy vitamin D and PTH levels.¹

If kyphosis is present on the basis of physical examination (often documented by height loss and shrinking of iliocostal distance), x-rays of the thoracic and lumbar spine (both AP and lateral) should be requisitioned to assess the presence of vertebral deformities or other spinal lesions. When ordering radiographic studies, explicitly request assessment for vertebral fractures.

Four Generations (con't)

The DXA is not advised for the eight-year-old. The BMD results for the rest of our case family are: a T-score of -2.3 for the 40-year-old; a T-score of -2.5 for the 62-year-old; a T-score of -2.7 for the 90-year-old.

Assessment of BMD can be used to better assess fracture risk. Figures 1 and 2 provide a guide to assign fracture risk according to BMD, age and whether the individual has a personal history of fragility fracture or is taking oral

Table 1:

Treatment Options for the Management of Osteoporosis in Canada

Treatment Options for Osteoporosis	Important Points
Hormone Therapy	After Women's Health Initiative study, use of HT for the sole treatment of osteoporosis discouraged
Calcitonin*	Efficacy in prevention of spinal fractures only; excellent as an analgesic for post spinal fracture pain
Selective estrogen receptor modulators (i.e., raloxifene)*	Frequent intolerance
Teriparatide*	High cost of treatment, for selected severe cases only
Etidronate*	Not advised with the availability of safer and more effective bisphosphonates; benefit only in prevention of spinal fractures
Pamidronate*	IV form of bisphosphonates; used infrequently for osteoporosis
Alendronate*	Orally, 70 mg/week; form with integrated Vitamin D available
Risedronate*	Orally, 35 mg/week or 150 mg/month
Zoledronic acid**	5 mg IV infusion once yearly
Denosumab***	60 mg s.c. injections every six months

*Less commonly used osteoporosis treatments

**Effectiveness based on results from randomized clinical trials indicating an approximate 50% reduction of the fracture risk at the spine and peripheral bones

***Recently introduced

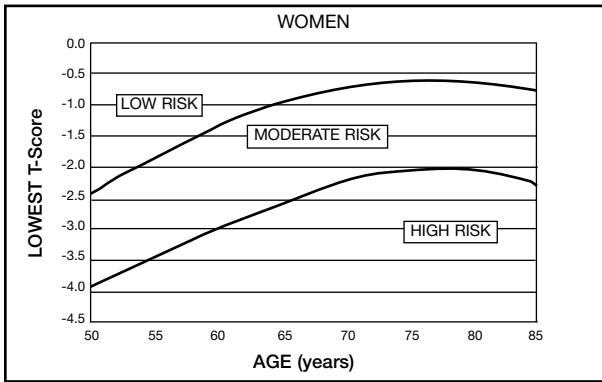


Figure 1: Risk of osteoporosis in women based on T-Score

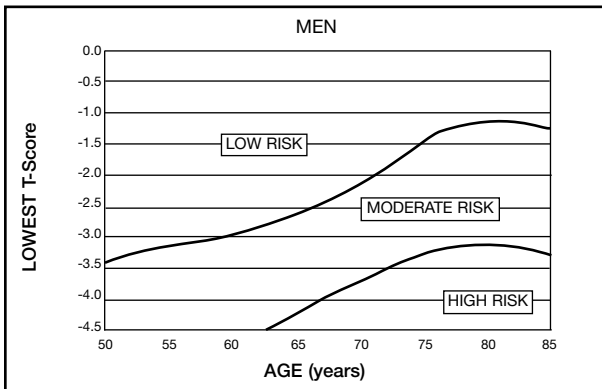


Figure 2: Risk of osteoporosis in men based on T-Score

glucocorticoids (prednisone > 7.5 mg/d for more than 3 months).⁴ On these graphs, the point that corresponds with both the lowest BMD (spine or hip) and the patient's age will assign a ten-year fracture risk. If there is a history of fragility fracture or glucocorticoid use, the individual moves into the next highest risk category.

BMD assessment by DXA is not used to make a diagnosis of osteoporosis, but rather to help predict fracture risk along with other risk factors collected from patient history, physical examination, and additional laboratory and x-ray tests. The majority of fractures are in women with a BMD above that

considered osteoporotic.⁵ If an osteoporotic fracture is confirmed, DXA measurements are useful to assess the response to treatment, but not necessary to confirm the diagnosis of osteoporosis.

Q&A *Who and when to treat?*

The 90-year-old woman should receive treatment to prevent disease progression and to help minimize the chances of suffering another fragility fracture despite results of BMD. Given her family history, the 62-year-old woman may consider therapy to reduce her fracture risk, particularly in view of significantly decreased BMD. Lastly, the 40-year-old woman with a maternal history of hip fracture and low bone density should be advised to maintain proper bone hygiene and if there is no additional osteoporosis risk factors, repeat DXA measurements at the time of menopause using the same DXA machine (at that point, therapy may be considered, particularly if significant bone loss is detected).¹

Q&A *What should we treat with?*

There are a large number of therapies available for the management of osteoporosis; however, numerous therapies have limited anti-fracture efficacy or are too costly for regular use. The choices for post-menopausal women are detailed in Table 1.

Q&A *Monitoring of therapy*

The use of the fracture risk assessment, presented here in Figures 1 and 2, can be used to assess untreated individuals, although use caution when evaluating fracture risk for men due to limited data at this time.⁴ During follow-up visits, check for the patient's history of falls and fractures, assess any height and weight



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changes, and measure the iliocostal distance.

If a followup BMD has been performed with consistency of both the machine and technique, the BMD results can be compared to previous test(s). If the results are not significantly different (*i.e.*, lower than the least significant change), then there is a positive trend or significant improvement. Such results indicate good response to therapy, which usually corresponds to stronger bones. There likely has been a significant reduction in future fracture risk, and the patient should continue treatment with another review in one or two years.



Discontinuation of treatment

At this time, there is no clear indication as to when exactly therapy should be stopped. Most experts agree that it should continue indefinitely for high risk patients. Dose modifications, or “drug holidays”, have been considered for quite some time but clear recommendations are lacking.



What about men?

In most cases, a similar approach to osteoporosis management in women could be advised for men. Idiopathic osteoporosis of men is poorly understood and requires a full fracture risk assessment and treatment when risk is significant. There is less data to guide our decisions, as the majority of clinical trials, as well as guidelines for osteoporosis management, are based on data from studies of postmenopausal women.

The most commonly used therapies for men include: amino-bisphosphonates, hormone therapy (testosterone), and parathyroid hormone (teriparatide). Recently approved denosumab is also approved for treatment of osteoporosis.

Take-home Message

- Patients at risk for osteoporosis should undergo a full screening with history, physical examination, bloodwork, spine x-rays and BMD assessment.
- BMD should serve to help in fracture risk assessment, and be used as a tool to evaluate response to therapy.
- Among the therapies available for treating osteoporosis, the amino-bisphosphonates (*e.g.*, alendronate, risedronate, zoledronic acid) are the most commonly used and have impressive efficacy data.
- Monitoring and continuation of treatment should be advised on an individual basis. For patients in high risk groups, anti-fracture therapy should be continued indefinitely.
- In view of the lack of clear, evidence-based recommendations for treating men, one can follow fracture risk assessment, therapy and monitoring based on data largely from trials performed with women.

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