OHTAC Recommendation

Utilization of DXA Bone Mineral Densitometry in Ontario

November 2006
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The Ontario Health Technology Advisory Committee (OHTAC) met on November 17, 2006, and reviewed the analyses of Ontario administrative data and research evidence relating to the utilization of dual energy x-ray absorptiometry (DXA) bone mineral density (BMD) tests.

**DXA Bone Mineral Densitometry**

DXA bone mineral densitometry measures bone density based on differential absorption of X-ray beams by bone and soft tissues. It is the gold standard for detecting and diagnosing osteoporosis, a systemic disease characterized by low bone density and altered bone structure, resulting in low bone strength and increased risk of fractures. DXA densitometers are licensed as Class 3 medical devices in Canada. DXA densitometry is presently an insured health service in Ontario.

The World Health Organization (WHO) has established criteria for osteoporosis and osteopenia for postmenopausal women based on DXA BMD measurements: osteoporosis is defined as a BMD that is more than 2.5 standard deviations below the mean BMD for normal young adults (i.e. T-score < −2.5), while osteopenia is defined as a BMD that is more than 1 standard deviation but no more than 2.5 standard deviations below the mean for normal young adults (i.e. T-score < −1 & > −2.5).

**Osteoporosis and Fractures**

Approximately 16% of Canadian women and 6.6% of Canadian men have osteoporosis based on the WHO criteria, with the prevalence increasing with age. An additional 49.6% of Canadian women and 39% of Canadian men have osteopenia. Osteoporosis related fragility fractures in the femur, vertebra, pelvis, and wrist are associated with increased mortality and morbidity, and decreased quality of life. The cost of osteoporosis and osteoporotic fractures to Canada was estimated to be $1.3 billion in 1996.

The Osteoporosis Canada guidelines recommended BMD screening in people age 65 years or older and for people under age 65 if they have one major or two minor risk factors for accelerated bone loss.
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Analyses of Ontario Utilization Data & Research Evidence

Analysis of Ontario administrative data and review of research evidence showed:

Continued growth in the use of DXA BMD Tests: BMD tests in Ontario are still increasing at a rate of 6% to 7% per year, reaching approximately 500,000 tests in 2005/06. Women accounted for 90% of all DXA BMD tests, with the highest number in women in the 55-60 and 60-64 age groups. There has been a continued decrease in the rate of hip fractures concomitant with the increase in the rate of BMD tests in the province.

- To realize the optimal benefits of DXA BMD tests in preventing fractures, the use of the test needs to be shifted from people at low risk of developing osteoporosis to those at high risk of developing osteoporosis and fractures.

- Inappropriate use: OHIP data suggest that up to 20% of the BMD tests were performed in low risk individuals (under age 65 years and coded as at low risk of accelerated bone loss). This is not consistent with current Canadian guidelines. Current Osteoporosis Canada guidelines recommend BMD testing only in high risk individuals (people over the age of 65 years and in people younger than 65 if they have at least one major or two minor risk factors that predispose them to low BMD and fractures).

- Inappropriate use: In 2005/06 fiscal year, approximately 21,000 BMD tests were repeat tests within a 24 month period in low risk individuals. An analysis using a mathematical model that incorporated least significant changes of BMD tests, different rates of bone loss, different baseline BMDs, and the BMD threshold for initiating treatment showed that:
  - For people at a normal rate of bone loss ≤ 1% per year, it will take approximately 3 years for the BMD loss to exceed the least significant change of a 1% precision test.
  - For people with normal baseline BMD (T-score ≥ −1), a rate of bone loss ≤ 1% per year, and at low risk of fractures, serial testing every 2 years as per current OHIP policy is not necessary, because the BMD is not likely to reach a level requiring treatment in less than 16 years after the baseline test.

- For patients who are receiving osteoporosis treatment, have a baseline BMD<−1, have a rate of bone loss greater than 1% per year, or have other major risks for accelerated bone loss, more frequent BMD monitoring may be required.
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- Under-use after fracture: Research literature showed that the presence of any prevalent fragility fracture increases the risk for future fractures within the first year by 8% and long-term risk by approximately 2-fold or more. Therapy with antiresorptive drugs has been shown to significantly reduce the risk of vertebral fractures by 40%–50% and non-vertebral fractures from 30% to 50% in postmenopausal osteoporotic women and osteoporotic men. Studies in Canada and other jurisdictions suggest that patients who had undergone BMD measurements and, particularly if a diagnosis of osteoporosis was made, were more likely to be given pharmacologic bone-sparing therapy. Despite these findings, only 19% of Ontarians age ≥65 years who had a fracture underwent BMD testing, and only 41% received osteoporosis treatment during the year following the fracture.

- Under-use in men: Men accounted for 24% of all hip fractures and 21% of all wrist fractures. Hip fractures in men are associated with higher mortality rates compared to women. Analyses showed that men only accounted for 10% of BMD tests in Ontario. The rates of BMD tests and treatment after a fracture in men ≥65 years were only half of those in women.

- Geographical variation: In 2005/06, there was a 10-fold variation in the rate of BMD testing between the county with the highest rate (Toronto) and the county with the lowest rate (Kenora). Although the gap has decreased from the 17-fold variation reported in 2000, the rates of BMD use in northern counties still tend to be low.

Economic Analyses

A decision analysis showed that in patients 65 years and older, increasing the rate of BMD tests and treatment following a fragility fracture is cost effective. A budget impact analysis showed that shifting the use of DXA BMD tests from people age < 65 years at low risk of osteoporosis to high risk men and people following a fragility fracture will likely result in a net saving of $1.2 million to $5 million per year, including downstream cost avoidance due to anticipated decreased re-fractures rates.

Current Ministry Initiatives

An Osteoporosis Strategy has been developed under the ministry’s Osteoporosis Program. As part of this strategy, Osteoporosis Canada is developing new guidelines for men and perimenopausal women (women age 40–60 years). A mandatory standard requisition form is also being developed to facilitate risk assessment and data collection.
OHTAC Recommendation

Based on a review and appraisal of the utilization data and evidence, OHTAC makes the following recommendation:

- In consultation with the Osteoporosis Program, change the current Ontario reimbursement policy for DXA BMD testing to reflect current guidelines which recommend BMD tests only in people at high risk of accelerated bone loss. These include:
  - People over the age of 65 years regardless of the absence of other risk factors and
  - People aged 65 years or younger if they have risk factors that predispose them to low BMD or fractures.

- In consultation with the Ontario Osteoporosis Program, change Ontario reimbursement policy for serial DXA BMD testing for people who have a normal baseline BMD and no major risks for accelerated bone loss other than age over 65 years, so that a repeat BMD may be performed in 3 - 5 years after the baseline test to establish the rate of bone loss. If the rate of bone loss is \( \leq 1\% \) per year, another BMD is not required for 7 to 10 years.

- BMD should be performed at the discretion of the physician (usually every 1 to 2 years) if one or more of the following risk factors are present:
  - Low baseline BMD (T-score < -1)
  - One or more major risk factors for fractures
  - Rate of bone loss > 1% per year
  - Receiving osteoporosis treatment

- Support the Ontario Osteoporosis Program’s initiatives to increase physician and public awareness of appropriate BMD testing and osteoporosis treatment, particularly in all men and women following a fragility fracture after age 40 years.

- Support the Ontario Osteoporosis Program’s initiatives to develop and disseminate guidelines for BMD testing in men at high risk of accelerated bone loss and initiatives for ongoing monitoring and evaluation of BMD use in Ontario.

- Ensure that all DXA BMD facilities in the province meet standards for precision and reporting for DXA BMD tests.
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- Develop and implement a planning framework to ensure availability of BMD facilities in counties with low BMD claims to ensure equitable access to BMD services in the province.