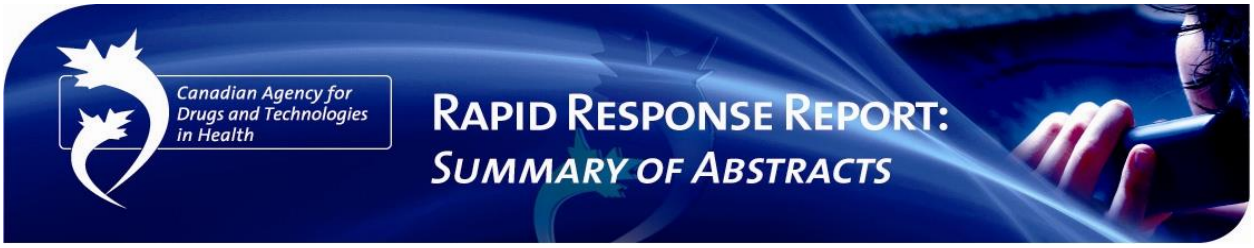

TITLE: Repeat Dual Energy X-Ray Absorptiometry Intervals in Osteoporosis: Clinical Effectiveness and Guidelines

DATE: 04 March 2015

RESEARCH QUESTIONS

1. What are the clinical benefits and harms of repeat dual energy x-ray absorptiometry (DEXA) scans every two years in patients with osteoporosis or at risk for osteoporosis?

2. What are the evidence-based guidelines for DEXA in patients with osteoporosis or at risk for osteoporosis?

KEY FINDINGS

Two health technology assessments, one observational study, and eight evidence-based guidelines were identified regarding the clinical effectiveness of DEXA every two years in patients with osteoporosis or at risk for osteoporosis.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2015, Issue 2), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2010 and February 16, 2015. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Patients with osteoporosis or at risk for osteoporosis
Intervention	Repeat dual x-ray absorptiometry (DEXA) < 2 year versus > 2 year intervals
Comparator	Comparison between intervals
Outcomes	Improvement in outcomes Clinical benefits and harms Guidelines
Study Designs	Health technology assessments, systematic reviews and meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Two health technology assessments, one observational study, and eight evidence-based guidelines were identified regarding the clinical effectiveness of DEXA every two years in patients with osteoporosis or at risk for osteoporosis. No relevant systematic reviews, meta-analyses, or randomized controlled trials were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Two health technology assessments,[1,2] one observational study,[3] and eight evidence-based guidelines[4-11] were identified regarding the clinical effectiveness of DEXA every two years in patients with osteoporosis or at risk for osteoporosis.

One health technology assessment[1] did not identify any RCTs that have compared different schedules of serial bone mineral density monitoring during pharmacotherapy for osteoporosis as a predictor of fracture. A second health technology assessment of screening and monitoring tests in osteoporosis and osteopenia[2] reported on two observational studies that found that repeat screening in adults did not improve the estimation of fracture risk. One of the studies which modelled predictions found that repeat screening at less than two years would not be useful, and that repeat screening at less than three years would demonstrate utility only for elderly patients with substantial osteopenia.

An observational study[3] assessed optimal intervals for bone mineral density (BMD) testing based on the time for 10% of women to develop osteoporosis before having a hip or vertebral fracture. Estimated BMD testing intervals were 16.8 years for women with normal BMD, and 17.3 years, 4.7 years, and 1.1 years for women with mild, moderate and advanced osteopenia, respectively.

Eight evidence-based guidelines[4-11] were identified regarding repeat DEXA in patients with osteoporosis or at risk for osteoporosis. Detailed recommendations are provided in Table 2.

Table 2 : Summary of Guidelines and Recommendations

Author (Year)	Guidance
ACOG (2012)[4]	*"In the absence of new risk factors, dual-energy X-ray absorptiometry (DXA) screening should not be performed more frequently than every 2 years.* *In the absence of new risk factors, DXA monitoring of therapy should not be repeated once bone mineral density (BMD) has been determined to be stable or improved."* Major Recommendations, Level B.
RACGP (2012)[5]	*"For patients aged over 45 years who sustain a low trauma fracture Postmenopausal women, and men with a suspected vertebral fracture (loss of height >3 cm, kyphosis, back pain).* *Recommendation:* *BMD and management of risk factors (II,A)* *Investigate for causes of secondary osteoporosis if indicated by history, examination findings or BMD result. Recommend that such individuals are initiated on effective anti-osteoporosis therapy unless there are specific contraindications.* *DXA at presentation and no more than every 2 years (II,B).* *Repeat only when it is likely to change management.* *Where there is a specific bone mineral wasting condition or medication, consider more frequent repeat of DXA."* Table 14.1 – Osteoporosis: Identifying Risk
BC MSC (2011)[6]	*"There is insufficient evidence to recommend a testing frequency for patients not taking OP medications. Based on a patient's risk profile, BMD retesting may be indicated in 3-10 years.* *For patients on OP medication, repeat BMD examinations are not justified based on current evidence. If a BMD is to be done, any changes would be difficult to detect prior to 3 years. Consider more frequent testing in specific high risk situations (e.g., multiple risk factors, or receiving ≥7.5 mg prednisone daily or its equivalent for 3 months consecutively who require a baseline examination and repeat scans at 6-month intervals while on treatment)."* Follow-Up BMD Measurements
USPSTF (2011)[7]	*"A lack of evidence exists about optimal intervals for repeated screening and whether repeated screening is necessary in a woman with normal BMD. Because of limitations in the precision of testing, a minimum of 2 years may be needed to reliably measure a change in BMD; however, longer intervals may be necessary to improve fracture risk prediction."* Page 359
OSC/TOP (2002, updated 2010)[8]	*"Not required more frequently than q2 years, except in patients:* *- On 7.5 mg prednisone/day (or equivalent) x 3 months who require baseline and q6 month DXA while on treatment* *- With existing fractures or very low bone density where early DXA is*

Table 2 : Summary of Guidelines and Recommendations	
Author (Year)	**Guidance**
	indicated." Follow-Up BMD Measurements using DXA
Papaioannou et al. (2010)[9]	*"For patients who are undergoing treatment, repeat measurement of bone mineral density should initially be performed after one to three years; the testing interval can be increased once therapy is shown to be effective. For moderate-risk individuals, including those with a T-score of –2.5 or below, a repeat measurement of bone mineral density should be obtained after one to three years to monitor for rapid bone loss. If bone mineral density is stable, then less frequent monitoring can be considered. For individuals with low risk of fracture and without additional risk factors for rapid loss of bone mineral density, a testing interval of 5–10 years may be sufficient."* Page 6
NAMS (2010)[10]	*"In most cases, repeat DXA testing in untreated postmenopausal women is not useful until 2 to 5 years have passed, given the rate of bone loss of 1% to 1.5% per year. Postmenopausal women, after substantial BMD losses in early postmenopause, generally lose about 0.5 T-score units in BMD every 5 years.* *For women receiving osteoporosis therapy, BMD monitoring may not provide clinically useful information until after 1 to 2 years of treatment."* Page 32
AACE (2010)[11]	*"Obtain a baseline DXA, and repeat DXA every 1 to 2 years until findings are stable. Continue with follow-up DXA every 2 years or at a less frequent interval."* Page 5

AACE = American Association of Clinical Endocrinologists; ACOG = American College of Obstetricians and Gynecologists; BC MSC = British Columbia Medical Services Commission; BMD = Bone mineral density; DXA = Dual Energy X-Ray Absorptiometry; mg = milligrams; NAMS = North American Menopause Society; OP = osteoporosis; OSC = Osteoporosis Society of Canada; q2 = every two; q6 = every six; RACGP = Royal Australian College of General Practitioners; TOP = Towards Optimized Practice; USPSTF = U.S. Preventive Services Task Force.

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   See: Summary of Findings for Key Question 5, page 155

2. Screening and monitoring tests for osteopenia/osteoporosis: final report [Internet]. Olympia (WA): Washington State Health Care Authority, Health Technology Assessment Program; 2014 Oct 20 [cited 2015 Mar 3]. Available from: http://www.hca.wa.gov/hta/Documents/osteo_final_report_102014.pdf
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No literature identified.

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

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See: 3.8. How is Treatment Monitored?, page 5

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APPENDIX – FURTHER INFORMATION:

Review Articles

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See: Appendix 6 – Recommended Timing of Follow-up BMD Tests, page 18