



**TITLE:** Portable Bone Mineral Density Scanners for Screening and Diagnosis of Osteoporosis: Uses, Limitations, and Guidelines

**DATE:** 05 June 2013

## RESEARCH QUESTIONS

1. What is the clinical evidence regarding the uses and limitations of portable bone mineral density (BMD) scanners for screening and diagnosis of osteoporosis compared to standard BMD scanners?
2. What are the evidence-based guidelines regarding the use of portable BMD scanners for screening and diagnosis of osteoporosis?

## KEY MESSAGE

Three non-randomized studies were identified regarding the uses and limitations of portable bone mineral density (BMD) scanners for screening and diagnosis of osteoporosis compared to standard BMD scanners.

## METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 4), 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, 2008 and May 23, 2013. 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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## 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.

Three non-randomized studies were identified regarding the uses and limitations of portable BMD scanners for screening and diagnosis of osteoporosis compared to standard BMD scanners. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

## OVERALL SUMMARY OF FINDINGS

Three non-randomized studies<sup>1-3</sup> were identified comparing portable BMD scanners to non-portable axial dual energy x-ray (aDXA) scanners. Patients tested with the Calscan heel scanner were referred to aDXA if their T-score was  $\leq -2.5$ .<sup>1</sup> Based on the Calscan results, 13% of patients were diagnosed with osteoporosis and 56% with osteopenia. There was statistically significant correlation between heel and DXA scores at the spine and femoral neck. Male patients with advanced prostate cancer were screened using a portable peripheral DXA scanner before initiation of androgen deprivation therapy.<sup>2</sup> Patients with a pDXA T-score  $\leq -2.5$  were referred to aDXA. There was significant correlation between the pDXA T-scores at the forearm and aDXA scores at the femoral neck, total hip, and lumbar spine. The Metriscan compact digital radiographic absorptiometry device was used to determine phalangeal BMD in women presenting for a routine aDXA scan.<sup>3</sup> The authors concluded that the device was suitable for use in the community setting to triage post-menopausal women to receive aDXA. A scan of the dominant hand was most useful for triage.

## REFERENCES SUMMARIZED

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

No literature identified.

### Randomized Controlled Trials

No literature identified.

### Non-Randomized Studies

1. Kayalar G, Cevikol A, Yavuzer G, Sanisoglu Y, Cakci A, Arasil T. The value of calcaneal bone mass measurement using a dual X-ray laser Calscan device in risk screening for osteoporosis. *Clinics (Sao Paulo)*. 2009;64(8):757-62. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2728188> PM:19690659
2. Wadhwa VK, Parr NJ. Peripheral or axial bone density measurements to identify osteoporosis in prostate cancer patients undergoing androgen deprivation therapy? *Urology*. 2009 Jun;73(6):1347-51. [PubMed: PM19362345](http://pubmed.ncbi.nlm.nih.gov/19362345/)
3. Thorpe JA, Steel SA. The Alara Metriscan phalangeal densitometer: evaluation and triage thresholds. *Br J Radiol*. 2008 Oct;81(970):778-83. [PubMed: PM18591198](http://pubmed.ncbi.nlm.nih.gov/18591198/)

### Guidelines and Recommendations

No literature identified.

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**APPENDIX – FURTHER INFORMATION:**

**Guidelines and Recommendations – portable scanning searched but not mentioned in recommendations**

4. American Medical Directors Association (AMDA). Osteoporosis and fracture prevention in the long-term care setting. Columbia (MD): American Medical Directors Association (AMDA); 2009. 32 p. [76 references]  
Summary available from: <http://www.guideline.gov/content.aspx?id=15592>
5. Hans DB, Shepherd JA, Schwartz EN, Reid DM, Blake GM, Fordham JN, Fuerst T, Hadji P, Itabashi A, Krieg MA, Lewiecki EM. Peripheral dual-energy X-ray absorptiometry in the management of osteoporosis: the 2007 ISCD official positions. *J Clin Densitom.* 2008 Jan-Mar;11(1):188-206  
Summary available from: <http://www.guideline.gov/content.aspx?id=13507>

**Non-Randomized Studies**

*Portable Device for Fracture Prediction*

6. Friis-Holmberg T, Brixen K, Rubin KH, Gronbaek M, Bech M. Phalangeal bone mineral density predicts incident fractures: a prospective cohort study on men and women--results from the Danish Health Examination Survey 2007-2008 (DANHES 2007-2008). *Arch Osteoporos.* 2012 Dec;7(1-2):291-9.  
[PubMed: PM23152065](#)