



Bone density testing in general practice

A guide to Dual Energy X-ray Absorptiometry (DXA)

Scanning of the axial skeleton by dual energy X-ray absorptiometry (DXA) is the gold standard in Australia for the measurement of bone mineral density (BMD). DXA is a diagnostic tool for osteoporosis or osteopenia, enabling doctors to determine the extent of bone loss for clinical decision making. Who to refer for DXA and how to interpret a bone densitometry report, are outlined in this guide.

Poor bone health is common in Australia

An estimated 4.7 million Australians over the age of 50 currently have osteoporosis or osteopenia, with over 165,000 associated fractures (2018). Without major improvements in diagnosis and management, the rate of osteoporotic fracture will be around 30% higher by 2022, costing an estimated \$33.6 billion over a decade.

In general practice, early detection can prevent a first fracture. For patients who have already fractured, investigation and initiation of osteoporosis medication is crucial to reduce the very high risk of subsequent fractures.



Who to send for a DXA scan

Patients over 50 with risk factors	MBS item
Family history – parent with hip fracture	No rebate
Early menopause	12312
Hypogonadism	12312
≥ 3 months glucocorticoids (at Prednisone ≥ 7.5mg)	12312
Coeliac disease/malabsorption disorders	12315
Rheumatoid arthritis	12315
Primary hyperparathyroidism	12315
Hyperthyroidism	12315
Chronic kidney or liver disease	12315
Androgen deprivation therapy	12312
Recurrent falls	No rebate
Breast cancer on aromatase inhibitors	No rebate
Treatment with antiepileptic medications	No rebate
Low body weight	No rebate
HIV and its treatment	No rebate
Major depression/ SSRI treatment	No rebate
Type 1 and type 2 diabetes mellitus	No rebate
Multiple myeloma/monoclonal gammopathy	No rebate
Organ or bone marrow transplant (item 12312 applies if treated with glucocorticoids or if kidney disease present)	No rebate

Patients with a minimal trauma fracture	MBS item
A minimal trauma fracture in a patient over 50 indicates probable osteoporosis. DXA is recommended to confirm low bone density and to establish a baseline BMD for treatment.	12306

Suspected vertebral fracture	MBS item
Refer for spinal X-ray when: <ul style="list-style-type: none"> – Height loss of 3cm or more – Thoracic kyphosis – New onset back pain suggestive of fracture 	
If fracture confirmed, refer for DXA	12306
<i>Vertebral fracture assessment (VFA) is offered with some DXA scans. VFA may be a useful screen for fractures in people with height loss. MBS rebate not available for VFA.</i>	

Patients over 70 years of age	MBS item
For men and women over 70 years, MBS rebate applies (regardless of other risk factors)	12320
Patients with a normal result or mild osteopenia (as measured by a T-score down to -1.5) will be eligible for one scan every 5 years	12320
Patients with moderate to marked osteopenia (as measured by a T-score less than -1.5 and above -2.5) will be eligible for one scan every two years	12322

The DXA report

The level of detail provided in a DXA report varies. To comply with guidelines, all reports should state the make and model of the DXA machine used, BMD (measured in g/cm²), T-score and Z-score.

Medical Imaging Centre – Bone Densitometry Report

Dear Doctor

Re: [Patient]

DOB:

This patient attended on for bone densitometry of AP spine and left hip.

Bone mineral density was measured by [DXA machine make and model]. The results are summarised below:

Scan date:

Sex: Female

Age at scan: years

Ethnicity:

L1–L4 or L2–L4 usually measured.

T-score compares the patient's BMD with that of young healthy adults of the same sex.

Scan site	Region	BMD	T-score	Z-score
AP spine	L2-L4	0.890	-2.6	-1.1
Left femur	Total	0.822	-1.5	-0.4
	Neck	0.831	-1.5	-0.0

Total proximal femur combines femoral neck, shaft and trochanter.

Z-score compares the patient's BMD with that of adults of the same age and sex.

Results

Lumbar spine: This patient has a BMD T-score of 2.6 SD below the mean for young females at this site. BMD is considerably reduced.

Left femur: This patient has a BMD measurement of 1.5 SD below the mean for young females at this site. BMD is mildly reduced.

Vertebral fracture assessment: VFA demonstrates a deformity of L3, indicating a probable vertebral fracture. Confirmation with X-ray is recommended.

T-score

The T-score compares the patient's bone density to the peak bone density of young adults. It is the number of standard deviations (SDs) of the BMD measurement above or below that of young healthy adults of the same sex. According to definitions agreed by the World Health Organisation, a T-score of -2.5 or lower at the spine or hip is indicative of osteoporosis.

VFA (vertebral fracture assessment) is offered by some imaging centres. It is a useful screening tool for asymptomatic vertebral fracture. Fractures detected by VFA should be confirmed by plain x-ray. VFA does not attract an MBS rebate.

Normal bone density	T-score -1.0 or above	BMD not more than 1.0 SD below young adult mean
Osteopenia	T-score between -1.0 and -2.5	BMD between 1.0 and 2.5 SDs below young adult mean
Osteoporosis	T-score -2.5 or below	BMD 2.5 or more SDs below young adult mean

Z-score

The Z-score compares the patient's bone density to that of adults of the same age. It is the number of SDs of the BMD measurement above or below that of adults of the same age and sex. Z-score is a useful indicator of possible secondary osteoporosis. A Z-score of -2.0 or below should trigger investigations for underlying disease to exclude other causes of bone mineral loss.

www.osteoporosis.org.au

National toll-free number for patients 1800 242 141