



Therapeutic Brief

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Stopping osteoporotic fractures

In Australia, osteoporosis and osteopenia occurs in more than 66% of people 50 years and older.¹ Most people are not aware of their own fracture risk and most do not receive appropriate education, screening or management even after they have had a minimal trauma fracture (a fracture after falling from standing height or less).²⁻⁵

Most people at high-risk are NOT screened



Most people are NOT aware of their fracture risk



66% of people with osteopenia do not receive appropriate treatment

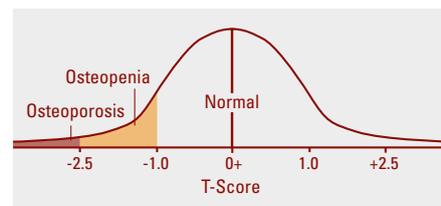
60% of people with osteoporosis do not receive appropriate treatment

70% of people with a prior fracture do not receive appropriate treatment

The mortality rate in the first 12 months after a hip fracture is 37% for men and 20% for women.⁶ Vertebral fractures are associated with significant long-term disability, pain and kyphosis.⁷ Early detection and appropriate treatment can reduce the risk of minimal trauma fractures in the future by as much as 70%.⁷

Discrepancies in information often make it unclear as to what is best practice for patients with osteoporosis or osteopenia. This therapeutic brief provides concise and practical information to help identify and treat

high-risk patients to prevent a first or second minimal trauma fracture, and to help identify what is available for PBS and MBS reimbursement.



World Health Organisation diagnostic criteria for osteoporosis, osteopenia and normal bone mineral density. Adapted with permission from *Osteoporosis Australia*

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Key points

- Refer all your patients aged 70 years and over for bone densitometry using dual energy X-ray absorptiometry (DXA) if they have not had one
- Use a fracture-risk calculator to help high-risk patients understand their own fracture risk and to discuss treatment options
- Start osteoporosis medicines in patients who sustain a minimal trauma fracture without waiting for a DXA scan
- Emphasise to patients the importance of taking their osteoporosis medicine as directed to obtain optimal treatment effects



Identify high-risk patients

Fast facts:

- In Australia, one in four men and two in five women aged 50 years and over sustain a minimal trauma fracture, most commonly because of osteoporosis or osteopenia and falling.⁸
- Osteoporosis is often a silent disease;⁶ vertebral fractures are painless in 70% of all people.⁹
- Increasing age, having a prior minimal trauma fracture and a history of falls are strongly associated with a future fracture.¹⁰
- Individuals with similar BMD but different clinical risk factors might have a different fracture risk.⁷
- Identify your patients with one or more major risk factors (see Box 1) and not receiving osteoporosis medicines, and refer them for a DXA scan.^{7, 11}
- Refer your patients 70 years and over for a DXA scan if they have not had one (see Box 1).^{7, 11}

- Refer your patients with a height loss of 3 cm or more, kyphosis or new unexplained back pain for a thoracolumbar X-ray.⁷
- Ask your patients if they ever feel unsteady on their feet or if they have fallen in the last year, or include a simple falls-risk screen and a fracture risk assessment in the 'Health Assessment for people aged 75 years and over' under MBS items 701, 707 or when preparing a GP Management Plan.^{7, 12} To find out more about preventing falls in older patients, refer to the previous MATES topic, *Medicines: the hidden contributor to falls and hip fractures*, at: www.veteransmates.net.au/topic-50
- Estimate absolute fracture risk using the 'Garvan Fracture Risk Calculator' (GRFC), at: www.garvan.org.au/bone-fracture-risk or the 'Fracture Risk Assessment Tool' (FRAX), at: www.shef.ac.uk/FRAX
- Fracture-risk calculators do not act as a qualifier for access to Repatriation or Pharmaceutical Benefits Scheme (PBS) subsidised therapies.⁷

Box 1. Risk factors for eligibility for bone densitometry using a DXA scan under the Medicare Benefits Schedule¹¹

MBS items 12320

- Aged 70 years and over and has not previously had bone densitometry

MBS Item 12306

- Previous minimal trauma fracture

MBS Item 12312

- Prolonged corticosteroid therapy defined as:
 - inhaled corticosteroid dosage equivalent to or greater than 800 mcg beclometasone or budesonide per day in an adult anticipated to last for at least four months or
 - oral corticosteroid dosage equivalent to or greater than 7.5 mg prednisolone per day in an adult anticipated to last for at least four months
- Conditions associated with excess glucocorticoid secretion
- Hypogonadism

MBS Item 12315

- Primary hyperparathyroidism
- Chronic liver disease
- Chronic renal disease
- Proven malabsorption disorders, including malabsorption of fat (faecal fat greater than 18 gm per 72 hours on a normal diet), bowel disease with vitamin D malabsorption (less than 25-hydroxyvitamin D level) or proven coeliac disease
- Rheumatoid arthritis
- Conditions associated with thyroxine excess

Eligibility for repeat testing

- Patients undergoing significant change in therapy for established low bone mineral density (BMD) or to confirm a presumptive diagnosis of low BMD based on one or more minimal trauma fractures, are eligible for repeat testing at 12 monthly intervals under item 12321.
- Monitoring a low BMD proven by bone densitometry at least 12 months previously under MBS item 12306.
- All patients aged 70 years and over:
 - with a T-score of -1.5 or above (e.g. -1.3) are eligible for repeat testing every five years under MBS item 12320
 - with a T-score between -1.5 and -2.5 are eligible for repeat testing every two years under MBS item 12322.

Start osteoporosis medicines

➤ To treat minimal trauma fractures

Fast facts:

- The single most important risk factor for a future fracture is a prior minimal trauma fracture.^{7, 13}
- An initial fracture increases the risk of a second fracture at least two-fold for women and four-fold for men.¹⁴
- Start osteoporosis medicines in your patients with a minimal trauma fracture not currently receiving treatment with any other PBS-subsidised osteoporosis medicine.¹⁵ A DXA scan is not essential before starting treatment in these patients, but is useful to provide a baseline BMD.^{7, 16}
- If the BMD T-score is above -1.5 (e.g. -1.0), refer your patients to a medical specialist to exclude non-fragility causes of fracture and for treatment advice.⁷

➤ To treat high-risk patients

Fast facts:

- Corticosteroids suppress bone formation, reduce intestinal calcium absorption and gonadal function, and increase the risk of falling because of myopathy.¹⁷
- The risk of fracture increases rapidly with more than 5 mg oral prednisolone or equivalent dosage during the initial three to six months of treatment. The risk continues to increase at a lesser rate for as long as corticosteroids are used.¹⁸
- Start an osteoporosis medicine in your patients who haven't had a fracture but are:
 - aged 70 years or older with a BMD T-score of -2.5 or less (e.g. -2.6), or
 - receiving oral or inhaled corticosteroids equivalent to or greater than prednisolone 7.5 mg per day for at least three months, and a BMD T-score of less than -1.0 (e.g. -1.3) for risedronate, or -1.5 or less (e.g. -1.7) for alendronate and zoledronic acid.¹⁵

➤ To reduce future fractures

Fast facts:

- Optimal duration of osteoporosis therapy is uncertain.¹⁹
- There is some evidence to suggest a break in treatment or a 'drug holiday' of up to five years can be considered in postmenopausal women with a T-score above -2.0 (e.g. -1.9) after five years of alendronate, and three years of zoledronic acid, and who are not at high risk of vertebral fracture.¹⁹ Drug holidays are not recommended for risedronate or denosumab.¹⁹
- The safety profile of denosumab remains favourable over 10 years of treatment, however, the benefits beyond 10 years are unknown.^{20,21}
- Unlike bisphosphonates, the effects of denosumab on bone resorption do not persist after treatment has been stopped.^{19,20} A fall in BMD and a steep increase in bone turnover markers occur as rapidly as two months after stopping denosumab.²⁰ Multiple rebound vertebral fractures have been seen in some people soon after stopping denosumab.²⁰
- Base your choice of treatment on the effectiveness and side effect profile of the medicine and route of administration that best suits your patient to encourage adherence.^{22,23} Consider your patient's preferences, comorbidities and tolerability of the medicine.^{23,24}
 - For detailed information about osteoporosis medicines, refer to the 'Australian Medicines Handbook' or 'NPS MedicineWise Osteoporosis' at: www.nps.org.au/medical-info/clinical-topics/osteoporosis#insights
 - To access the 2017 RACGP/Osteoporosis Australia guidelines, including a summary with flowchart 'Osteoporosis risk assessment, diagnosis and management', go to: www.osteoporosis.org.au/clinical-guidelines
 - Set your recall system to:
 - review patients 6 months after starting an osteoporosis medicine and 12 months thereafter
 - recall your patients when their 6 or 12 monthly injections are due.⁷
 - Base duration of therapy on your individual patient's response to treatment, side effects, ongoing fracture risk, age and comorbidities.²⁵
 - Reassess the need for ongoing therapy after five years in your patients taking a bisphosphonate whose T-score is above -2.5 (e.g. -1.5) and no new fractures.⁷
 - Continue treatment if the BMD is -2.5 or less (e.g. -2.8), or new fractures have occurred.²⁵
 - Re-assess the need for ongoing treatment with denosumab after five years. If you are stopping denosumab, consider starting an alternative therapy e.g. a bisphosphonate.^{19,20}
- If therapy is stopped, re-assess your patient's fracture risk annually and restart if there is evidence of bone loss, especially at the hip or if a further minimal trauma fracture occurs.^{7,25}

Box 2. PBS-subsidised medicines

Bisphosphonate therapy (alendronate, risedronate and zoledronic acid) for patients:

- of any age with a minimal trauma fracture regardless of BMD T-score
- aged 70 years or older with a BMD T-score of -2.5 or less (e.g. -2.8)
- taking prolonged corticosteroids with a BMD T-score less than -1.0 (e.g. -1.5).¹⁵

Denosumab for patients:

- of any age with a minimal trauma fracture regardless of BMD T-score
- aged 70 years or older with a BMD T-score of -2.5 or less (e.g. -2.8).¹⁵

Raloxifene for postmenopausal women with osteoporosis and a minimal trauma fracture.¹⁵ Raloxifene might be useful in younger postmenopausal women at risk of vertebral fracture who have a prior or family history of breast cancer, or when other therapies are poorly tolerated.⁷

Teriparatide for patients with severe osteoporosis (BMD T-score -3.0 or less, e.g. -3.1) who have had two or more fractures and at least one symptomatic new fracture after 12 months of taking an anti-resorptive medicine.¹⁵ Treatment must not exceed a lifetime maximum of 18 months.¹⁵

Hormone Replacement Therapy (HRT) for recently postmenopausal women.¹⁹

Educate patients, especially men

Fast facts:

- Almost three and a half times as many women 70 years and over receive osteoporosis treatment as men the same age, even though one third of hip fractures occur in men.²⁶
 - Some patients stop taking their medicines because they feel they don't benefit from them, and they underestimate their risk of fracture and its implications.²²
 - Patients taking some medicines including antipsychotics, benzodiazepines, opioids or selective serotonin reuptake inhibitors are at a significantly increased risk of falling and hip fracture.^{27,28}
 - Some anti-epileptic medicines including carbamazepine, valproate and phenytoin affect bone health. Patients at high-risk include those who are elderly or institutionalised.¹⁹
 - Some patients might have comorbidities including chronic musculoskeletal and osteoarthritic pain, anxiety and depression, high alcohol use and cognitive impairment.²⁸
- effects. Remind your patients of the seriousness and potential implications of a minimal trauma fracture, especially of the hip or vertebra, for them and their families as they get older.²⁹

➤ Talk about medicines

- Explain to your patients the benefits of taking an osteoporosis medicine as directed and how to minimise its side

- Offer to organise a dose administration aid (DAA) through DVA if needed. For further information, go to: www.dva.gov.au/providers/provider-programmes/dose-administration-aid-daa-service
- Explain how a Home Medicines Review (HMR) can be effective in reducing the risk of falls and helping your patients to better manage their medicines.³⁰

➤ Talk about exercise

- Explain to your patients that participating in moderately vigorous, progressive resistance and balance exercises two to three times a week will improve their musculoskeletal health and reduce their risk of falling and fracture.^{7,31}

- Offer to refer your patients to a physiotherapist via the *Australian Physiotherapy Association* at: www.physiotherapy.asn.au/APAWCM/Controls/FindaPhysio or an exercise physiologist via *Exercise and Sports Australia* at: www.essa.org.au for guidance and supervision on the most appropriate exercise program for them. DVA funds physiotherapy and exercise physiology services to eligible DVA patients which might be helpful for those with osteoporosis.

➤ Talk about other risk factors

- Explain to your patients that they can help prevent osteoporosis, falling and fractures by limiting their alcohol intake, not smoking, maintaining a healthy weight, having sufficient protein and calcium in their diet and safe sunlight exposure to maintain vitamin D levels.⁷

➤ Talk about involving a multidisciplinary team

- Highlight to your patients the benefits of working with a range of health

professionals to better manage their bone health and comorbidities.²⁸

- Encourage your patients to access the consumer guide 'What you need to know about osteoporosis' by *Osteoporosis Australia* at: www.osteoporosis.org.au/resources

➤ Talk about their fracture risk

- Encourage your patients at high-risk to access the 'Know Your Bones' self-assessment tool at www.knowyourbones.org.au and talk to you about their results.

What's happening with the latest research

About calcium and vitamin D supplements for fracture prevention

The benefits of calcium supplements with or without vitamin D supplements for fracture prevention for non-institutionalised people is very modest.⁷

About calcium and an increased risk of cardiovascular disease

Current evidence suggests that calcium intake from food and supplements is not associated with an increased risk of cardiovascular disease (CVD) if the total calcium intake does not exceed the recommended daily levels.³²⁻³⁴

The recommended total daily intake of calcium from food and supplements for women 50 years and older and for men 70 years and older is 1300 mg.⁷

- ✔ Offer a calcium supplement to your patients taking osteoporosis preventive medicines **ONLY** if their dietary calcium intake is insufficient, e.g. less than three to four servings of calcium rich foods per day, or if they are frail and institutionalised elderly patients.⁷
- ✔ Consider a combined calcium and vitamin D supplement for elderly residents of aged-care facilities.⁷

About osteonecrosis of the jaw

Osteonecrosis of the jaw (ONJ) in patients with osteoporosis taking bisphosphonate therapy or denosumab is rare.^{7,9,35,36} Estimates of the incidence of ONJ in patients taking bisphosphonates range from 1 per 10,000 to 1 per 100,000 patient-treatment years,^{7,35} and in patients taking denosumab the incidence is estimated to be 5.2 per 10,000 patient-treatment years.²¹ The risk appears to be increased in patients receiving high dose intravenous bisphosphonates with advanced malignancy, and in patients with poor oral hygiene, periodontal disease and after dental extractions.^{9,37}

- ✔ Tell your patients to have a dental check-up if starting a bisphosphonate or denosumab, especially if they have poor dental hygiene, fractured teeth or periodontal disease.^{9,35,37}
- ✔ If denosumab is stopped for dental extractions, restart promptly once healing is adequate (usually four to six weeks).²⁰

DVA funds dental services for eligible DVA patients. For further information,

go to: www.dva.gov.au/providers/dentists-dental-specialists-and-dental-prosthetists

About atypical femur fractures

There is a small risk of atypical femur fractures (AFF) with the use of bisphosphonates and denosumab. The risk appears to increase with long-term use of bisphosphonate therapy but remains stable with long-term use of denosumab.¹⁹ The incidence of AFF is estimated to be 1.78 per 100,000 per year after almost two years of bisphosphonate therapy and increases to 113 per 100,000 per year after nine to ten years of bisphosphonate therapy.³⁷ The rate is much lower than the expected rate of hip fractures in elderly osteoporotic patients.³⁷ The incidence of AFF in patients taking denosumab is estimated to be less than 0.1 per 10,000 patient-treatment years.²¹

- ✔ Consider the risk of AFF in your patients when continuing bisphosphonate therapy or denosumab.³⁷ Consider AFF if your patient develops thigh, hip or groin pain while taking a bisphosphonate or denosumab.¹⁹

Full reference list available on the website: www.veteransmates.net.au



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References

- Watts J, Abimanyi-Ochom J, Sanders K. Osteoporosis costing all Australians. A new burden of disease analysis 2012-2022. 2012. Osteoporosis Australia. Glebe, NSW. Available at: www.osteoporosis.org.au/sites/default/files/files/Burden%20of%20Disease%20Analysis%202012-2022.pdf [Accessed December 2017].
- Mitchell P, Ganda K, Seibel M. Australia and New Zealand Bone and Mineral Society Position Paper on Secondary Fracture Prevention Programs: A Call to Action. Sydney. 2015.
- Sheu A, Lopes L, Eisman J, Center J. Osteoporosis management in 2017: still thin and fragmented. *Intern Med J.* 2017; 47: 1329-1330.
- Chen J, Hogan C, Lyubomirsky G, Sambrook P. Management of osteoporosis in primary care in Australia. *Osteoporos Int.* 2009; 20: 491-6.
- Parker D. An audit of osteoporotic patients in an Australian general practice. *Australian Family Physician.* 2013; 42(6): 423-427.
- Osteoporosis National Action Plan Working Group. Osteoporosis National Action Plan 2016. Sydney. 2016.
- The Royal Australian College of General Practitioners and Osteoporosis Australia. Osteoporosis prevention, diagnosis and management in postmenopausal women and men over 50 years of age. 2nd edn. Melbourne. 2017.
- Australian Institute of Health and Welfare. Estimating the prevalence of osteoporosis in Australia. Available at: www.aihw.gov.au/reports/arthritis-other-musculoskeletal-conditions/estimating-the-prevalence-of-osteoporosis-in-australia/contents/table-of-contents [Accessed December 2017].
- Therapeutic Guidelines. Melbourne: Therapeutic Guidelines Limited. March 2017. Available at: <http://online.tg.org.au/ip/desktop/index.htm> [Accessed December 2017].
- Sheu A, Diamond T. Bone mineral density: testing for osteoporosis. *Australian Prescriber.* 2016; 39(2): 35-39.
- Australian Government Department of Health. Medicare Benefits Schedules: Category 2- Diagnostic Procedures and Investigations: Bone Densitometry. Available at: www9.health.gov.au/mbs/fullDisplay.cfm?type=item&q=ItemID&q=12306 [Accessed January 2018].
- Australian Government Department of Health. Medicare Benefits Schedule (MBS) Health Assessment for people aged 75 years and older: fact sheet. Available at: www.health.gov.au/internet/main/publishing.nsf/Content/mbsprimarycare_mbsitem_75andolder [Accessed December 2017].
- Bliuc D, Alarkawi D, Nguyen T, Eisman J, Center J. Risk of subsequent fractures and mortality in elderly women and men with fragility fractures with and without osteoporotic bone density: the Dubbo Osteoporosis Epidemiology Study. *J Bone Miner Res.* 2015; 30: 637-46.
- Center J. Fracture burden: what two and a half decades of Dubbo Osteoporosis Epidemiology Study data reveal about clinical outcomes of osteoporosis. *Curr Osteoporos Rep.* 2017; 15: 88-95.
- Australian Government Department of Health. Pharmaceutical Benefits Scheme (PBS) Available at: www.pbs.gov.au/pbs/home;jsessionid=15uuv8ipy2t40fx4ib864xew4 [Accessed February 2018].
- Osteoporosis Australia. Bone density testing in general practice. 2014. Available at: www.osteoporosis.org.au [Accessed December 2017].
- Seibel M, Cooper M, Zhou H. Glucocorticoid-induced osteoporosis: mechanisms, management, and future perspectives. *Lancet Diabetes Endocrinol.* 2013; 1: 59-70.
- van Staa T, Leufkens H, Cooper C. The epidemiology of corticosteroid-induced osteoporosis: a meta-analysis. *Osteoporos Int.* 2002; 13: 777-787.
- Australian Medicines Handbook. Adelaide. Australian Medicines Handbook Pty Ltd. 2017.
- Tsourdi E, Langdahl B, Cohen-Solal M, Aubry-Rozier B, Eriksen E, Guanabens N, et al. Discontinuation of denosumab therapy for osteoporosis: a systematic review and position statement by ECTS. *Bone.* 2017; 105: 11-17.
- Bone H, Wagman R, Brandi M, Brown J, Chapurlat R, Cummings S, et al. 10 years of denosumab treatment in postmenopausal women with osteoporosis: results from the phase 3 randomised FREEDOM trial and open-label extension. *The Lancet Diabetes & Endocrinology.* 2017; 5: 513-523.
- Lee S, Glendenning P, Inderjeeth C. Efficacy, side effects and route of administration are more important than frequency of dosing of anti-osteoporosis treatments in determining patient adherence: a critical review of published articles from 1970 to 2009. *Osteoporos Int.* 2011; 22: 741-53.
- Murad M, Drake M, Mullan R, Mauck K, Stuart L, Lane M, et al. Comparative effectiveness of drug treatments to prevent fragility fractures: a systematic review and network meta-analysis. *J Clin Endocrinol Metab.* 2012; 97: 1871-80.
- NPS MedicineWise. Osteoporosis. Available at: www.nps.org.au/medical-info/clinical-topics/osteoporosis [Accessed February 2018].
- Eriksen E, Diez-Perez A, Boonen S. Update on long-term treatment with bisphosphonates for postmenopausal osteoporosis: a systematic review. *Bone.* 2014; 58: 126-35.
- Chen J, Simpson J, Blyth F, March L. Managing osteoporosis with FRAX® in Australia: proposed new treatment thresholds from the 45&Up Study cohort. *Bone.* 2014; 69: 148-53.
- Leach M, Pratt N, Roughead E. Risk of hip fracture in older people using selective serotonin reuptake inhibitors and other psychoactive medicines concurrently: a matched case-control study in Australia. *Drugs Real World Outcomes.* 2017; 4: 87-96.
- Caughey G, Roughead E, Shakib S, McDermott R, Vitry A, Gilbert A. Comorbidity of chronic disease and potential treatment conflicts in older people dispensed antidepressants. *Age Ageing.* 2010; 39: 488-94.
- Inderjeeth C, Inderjeeth A, Raymond W. Medication selection and patient compliance in the clinical management of osteoporosis. *AFP.* 2016; 45(11): 814-817.
- Gillespie L, Robertson M, Gillespie W, Sherrington C, Gates S, Clemson L, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012: CD007146.
- Howe T, Shea B, Dawson L, Downie F, Murray A, Ross C, et al. Exercise for preventing and treating osteoporosis in postmenopausal women. *Cochrane Database Syst Rev.* 2011 :CD000333.
- Michaelsson K, Melhus H, Warensjö Lemming E, Wolk A, Byberg L. Long term calcium intake and rates of all cause and cardiovascular mortality: community based prospective longitudinal cohort study. *BMJ.* 2013; 346: f228.
- Kopecky S, Bauer D, Gulati M, Nieves J, Singer A, Toth P, et al. Lack of evidence linking calcium with or without vitamin D supplementation to cardiovascular disease in generally healthy adults: a clinical guideline from the National Osteoporosis Foundation and the American Society for Preventive Cardiology. *Ann Intern Med.* 2016; 165: 867-868.
- Chung M, Tang A, Fu Z, Wang D, Newberry S. Calcium intake and cardiovascular disease risk: an updated systematic review and meta-analysis. *Ann Intern Med.* 2016; 165: 856-866.
- Lyles K. Have we learned how to use bisphosphonates yet? *JAGS.* 2017; 65: 1902-1903.
- Chamizo Carmona E, Gallego Flores A, Loza Santamaría E, Herrero Olea A, Rosario Lozano M. Systematic literature review of bisphosphonates and osteonecrosis of the jaw in patients with osteoporosis. *Reumatología Clínica (English Edition).* 2013; 9:172-177.
- Dell R, Adams A, Greene D, Funahashi T, Silverman S, Eisemon E, et al. Incidence of atypical nontraumatic diaphyseal fractures of the femur. *J Bone Miner Res.* 2012; 27: 2544-50.

