Osteoporosis – Identifying and treating at risk patients

Osteoporosis is common but under-detected and under-treated.¹ This therapeutic brief outlines ways to identify and treat osteoporosis in members of the veteran community.

The Geelong Osteoporosis Study revealed that 87% of women aged over 79 years had a bone mineral density (BMD) result indicative of osteoporosis.² The lifetime risk of osteoporotic fracture in people aged over 60 years is approximately 56% for women and 29% for men.¹ Approximately 25% of patients with a hip fracture die within 12 months of sustaining the fracture.³ Mortality also increases in the first year after all major fractures, including vertebral fractures; however, vertebral fractures go largely undetected.³ While there is no known cure for osteoporosis, osteoporotic fractures can be prevented through identifying risk factors and appropriate management.⁴ However, despite high-level evidence for efficacy, safety and cost effectiveness, less than 30% of Australian women and only 10% of Australian men with osteoporosis (even with fragility fractures) take a specific anti-osteoporotic medicine.⁵,⁶

Identifying osteoporosis

Since osteoporosis lacks obvious clinical symptoms, it is important to review the patient’s medical history, including checking for previous low trauma fractures. Lifestyle factors that add to a patient’s risk include smoking, low level of physical activity and excessive alcohol consumption.¹ Further investigate any individual with osteoporosis risk factors and consider measuring BMD (Box 1). The World Health Organization defines osteoporosis when BMD at any major skeletal site is equal to or more than 2.5 standard deviations below the mean for normal people aged 30 years (i.e. a T-score of –2.5 or lower).⁷

Box 1: Osteoporosis risk factors that indicate the need for BMD testing*¹,⁸

- pre-existing minimal trauma fracture(s)
- women and men aged 70 years or older
- female hypogonadism lasting more than 6 months before the age of 45
- certain medicines – e.g. prolonged corticosteroid treatment
- secondary causes – e.g. rheumatoid arthritis, hyperparathyroidism, chronic kidney or liver disease, male hypogonadism, proven malabsorption conditions, or conditions associated with excess corticosteroid secretion or thyroxine excess.

* Medicare reimburses DXA scanning for these risk factors.
### Treating osteoporosis

Ensuring adequate calcium and vitamin D plus addressing lifestyle factors where possible are considered the foundations of osteoporosis prevention and management. Consider adjunct pharmacological treatment in patients:

- with a minimal trauma fracture (secondary prevention)
- aged 70 years or older with a T-score of –3.0 or lower (primary prevention)
- currently on prolonged (at least 3 months), high dose corticosteroid treatment (at least 7.5mg per day prednisolone or equivalent) and with a T-score of –1.5 or lower.

#### Pharmacological treatments

Many factors influence the choice of pharmacological treatment such as gender, menopausal status, medical history, whether it is for primary or secondary fracture prevention, patient preference and eligibility for government subsidy. 

**Note:** Hormone Replacement Therapy (HRT) is not recommended for osteoporosis treatment.

### Table 1: Bisphosphonates to treat osteoporosis\(^1,9,20\)

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Examples of Brands</th>
<th>Dose*^</th>
<th>Considerations for bisphosphonates^</th>
</tr>
</thead>
</table>
| Alendronate | Fosamax\(^\text{®}\) & various generic brands | 70 mg tablet weekly (10 mg daily tablet also available but not PBS listed) | Contraindications:  
  - hypocalcaemia  
  - uveitis  
  - for tablets (other than Actonel\(^\text{®}\) EC), an inability to sit or stand upright for 30 minutes, or any disorders which delay oesophageal emptying.  
  - uveitis  
  - hypocalcaemia  
  - other (than Actonel\(^\text{®}\) EC), an inability to sit or stand upright for 30 minutes, or any disorders which delay oesophageal emptying. |
| Alendronate plus vitamin D3 | Fosamax Plus\(^\text{®}\)\(^\text{TM}\), Dronalen\(^\text{®}\) Plus | 70 mg/70 μg or 140 μg tablet weekly | Calcium supplements should be taken 2 hours apart from oral bisphosphonates. |
| Alendronate plus vitamin D3 with calcium carbonate | Fosamax Plus D-Cal\(^\text{®}\)\(^\text{TM}\), Dronalen Plus D-Cal\(^\text{®}\)\(^\text{TM}\) | 70 mg/140 μg tablet weekly; 1.25 g calcium tablets daily | Vitamin D should be corrected to a level above 50 nmol/L before commencing therapy. ONJ reported rarely. Good dental hygiene and care is essential. Consider dental assessment and complete any dental procedures before starting treatment to minimise risk of ONJ. Cease treatment if arises. Zoledronic acid is an IV infusion over 15 minutes. Headache, myalgia and fever, may be experienced soon after IV infusion. |
| Risedronate | Actonel\(^\text{®}\) & various generic brands (35 mg tablets only) | 5 mg tablets daily, 35 mg tablets weekly, or 150 mg tablet monthly | Tablets taken in morning on empty stomach with a full glass of water; patient should remain upright for 30 minutes and not eat or drink anything else in that time. (Note: Actonel\(^\text{®}\) EC can be taken with or without food.) |
| Risedronate with calcium carbonate | Actonel\(^\text{®}\) EC (enteric coated)** | 35 mg tablets weekly | Calcium supplements should be taken 2 hours apart from oral bisphosphonates. |
| Risedronate with calcium carbonate/ vitamin D | Actonel\(^\text{®}\) Combi, Actonel\(^\text{®}\) EC Combi (enteric coated)** | 35 mg tablet weekly; 1.25 g calcium tablets daily on other 6 days of the week | Vitamin D should be corrected to a level above 50 nmol/L before commencing therapy. ONJ reported rarely. Good dental hygiene and care is essential. Consider dental assessment and complete any dental procedures before starting treatment to minimise risk of ONJ. Cease treatment if arises. Zoledronic acid is an IV infusion over 15 minutes. Headache, myalgia and fever, may be experienced soon after IV infusion. |
| Zoledronic acid | Aclasta\(^\text{®}\) | 5 mg in 100 mL I.V solution yearly | ONJ reported rarely. Good dental hygiene and care is essential. Consider dental assessment and complete any dental procedures before starting treatment to minimise risk of ONJ. Cease treatment if arises. Zoledronic acid is an IV infusion over 15 minutes. Headache, myalgia and fever, may be experienced soon after IV infusion. |
| Etidronate with calcium carbonate | Didrocal\(^\text{®}\) | 2x200 mg tablets nightly for 14 days then 1.25 g calcium tablets daily for 76 days | Guidelines recommend reconsidering bisphosphonate therapy after 5–10 years in postmenopausal women and older men who respond well to treatment, as determined by BMD testing and fracture risk assessment (i.e. T-score above −2.5 and no recent fractures). If treatment has ceased, measure BMD a year later and assess the risk of falls. Restart treatment if BMD decreases significantly (lumbar spine decrease of 5% or more) or with any additional fracture.\(^1,9\) |

### Note:

1. 1 μg vitamin D = 40 International Units (IU)\(^11\), ONJ: Osteonecrosis of the jaw. *Doses are for brands listed in the table.  
2. Read individual product information leaflets for full details. \(^1\)Replacing conventional Actonel\(^\text{®}\) 35 mg tablets in Jan 2012.
Table 2: Other treatments for osteoporosis

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Examples of Brands</th>
<th>Dose^A</th>
<th>Practice Points^</th>
<th>Safety Considerations^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denosumab</td>
<td>Prolia®</td>
<td>60 mg in 1 mL subcutaneous injection, 6 monthly</td>
<td>Consider dental assessment and complete any dental procedures before starting treatment to minimise risk of ONJ.</td>
<td>No dose adjustment is necessary in renal impairment. Contraindicated in hypocalcaemia. Correct hypocalcaemia before initiating. Long-term safety and efficacy data are lacking; there are particular concerns regarding effects: • on the immune system (e.g. increased risk of infection) • on bone, including after treatment has stopped • of taking denosumab after bisphosphonate use.</td>
</tr>
<tr>
<td>Raloxifene</td>
<td>Evista®</td>
<td>60 mg tablet daily</td>
<td>Fasting is not required.</td>
<td>Contraindicated in patients with a history of VTE. VTE rarely reported. Cease in patients who require immobilisation for long periods (e.g. hospitalisation).</td>
</tr>
<tr>
<td>Strontium ranelate</td>
<td>Protos®</td>
<td>2 g sachet nightly</td>
<td>Taken at bedtime, mixed with ≥ 30 mL of water at least 2 hours after food, calcium-containing products or antacids.</td>
<td>Contraindicated in severe renal impairment. VTE reported rarely – use with caution in patients with or at risk of thromboembolic disorders. Severe hypersensitivity reactions (e.g. Stevens-Johnson syndrome, DRESS) reported rarely. DRESS is a life-threatening allergic reaction; strontium should be ceased.</td>
</tr>
<tr>
<td>Teriparatide</td>
<td>Forteo®</td>
<td>20 μg subcutaneous injection daily in the thigh or abdomen (multi-dose pre-filled pen).</td>
<td>Initiated by a specialist.</td>
<td>Restricted to 18-month lifetime exposure (caused osteosarcoma in animal studies); informed consent required.</td>
</tr>
</tbody>
</table>

Note: 1 μg vitamin D = 40 International Units (IU)21. ONJ: Osteonecrosis of the jaw; VTE: Venous thromboembolism; DRESS: Drug rash with eosinophilia and systemic symptoms. ^Doses are for brands listed in the table. ^ Read individual product information leaflets for full details.

**Raloxifene**

Raloxifene is a selective oestrogen receptor modulator that has been shown to prevent postmenopausal bone loss. It has beneficial oestrogen-like effects on bone but also has anti-oestrogen effects on the breast and endometrium. Raloxifene produces a similar reduction in vertebral fractures to bisphosphonates; however, it has not been shown to prevent non-vertebral fractures.1,11,24,25 It is PBS listed for postmenopausal women with a minimal trauma fracture (secondary prevention).

**Strontium ranelate**

Strontium ranelate is an antiresorptive medicine and increases bone mineral density. Evidence supports the use of strontium ranelate 2 g/day for both primary and secondary prevention of vertebral fractures in postmenopausal women1,11,26,27, it is also PBS listed for this patient group.

**Teriparatide**

Teriparatide is a synthetic form of human parathyroid hormone, which acts by inhibiting bone resorption and increasing bone formation.1,11,23 Because of its expense, the PBS listing restricts it for patients with a very high risk of fracture and when other drugs have failed (i.e. fracture has occurred during antiresorptive treatment) or are not tolerated.

**Ensure adequate calcium and vitamin D**

Evidence for calcium plus vitamin D supplementation mainly exists in frail older people, particularly for women in residential care where it has been shown to prevent fractures.1,8,10,28 The recommended daily calcium intake is 1200 mg for women aged over 50 years and men aged over 70 years.29 It can be difficult for many older people to meet these requirements through diet alone; therefore, supplements are often recommended.11,32 Since vitamin D is mainly obtained through sun exposure, older patients, particularly those in residential care, are commonly deficient in vitamin D; most will need supplementation.5,11

To optimise efficacy, it is recommended that calcium supplements be taken together with at least 800 units of vitamin D3 (cholecalciferol) per day.1 Since calcium carbonate requires adequate stomach acid to be absorbed, consider calcium citrate in patients on proton pump inhibitors or with compromised gastric acidity.1,11 Note: calcium citrate (e.g. Citracal) is not available on the PBS. Vitamin D3 in combination with some bisphosphonates is available on the PBS (see Table 1). Calcium carbonate (e.g.CAL-600, Cal-Sup, or in combination with some bisphosphonates) is available on the RPBS.

**The risk of cardiovascular events with calcium supplements**

Recent publications suggesting an increased risk of cardiovascular events with the use of calcium supplements are the subject of international debate, and the findings are not universally accepted.31,32
Ongoing management

**Lifestyle measures** include exercise, an adequate diet, reducing alcohol consumption, and smoking cessation.

Exercise maintains muscle strength, flexibility, mobility, and balance; all factors that help to reduce the risk of falls. Weight-bearing exercise is preferable, such as walking, Tai chi and gentle weights, as it can help to improve bone density. Exercise programs should be individualised to patients’ needs and abilities.

**BMD re-testing** assesses treatment efficacy and disease progression. Consider BMD testing by DXA every two years after therapy begins, or every 12 months if there is significant change in therapy or patients are on prolonged corticosteroid treatment.

In patients at high-risk of osteoporosis but not on pharmacological treatment, DXA may be repeated every 2 years to re-assess the fracture risk and the need for anti-osteoporotic treatment.

**Consider a Home Medicines Review (HMR) by an accredited pharmacist to help:**

- educate patients about their osteoporosis medicines, particularly if initiated recently
- optimise the medicine regime and identify issues affecting adherence
- identify whether any medicines are increasing the patient’s risk of falls because of their side effects (Box 2). Accredited pharmacists have been provided with a modified Falls Risk Assessment Tool (FRAT) to assist them in reviewing a patient’s medicines in the context of overall falls risk. The accredited pharmacist may provide you with a copy of this assessment in their report.

**Consider falls prevention strategies in patients with osteoporosis**

Falls prevention strategies are highly recommended, as falls are responsible for 90% of hip fractures and 50% of vertebral fractures in older patients. Multiple factors can contribute to falls, including some medicines (Box 2), poor balance and muscle strength, unsafe footwear, and poor eyesight.

Consider a home visit by an occupational therapist who can advise patients on removing potential hazards to help reduce the risk of falls, and can also assess for falls prevention items available through either the HomeFront Program – a DVA falls and accident prevention program or for more specific aids or appliances, the Rehabilitation Appliances Program. See Further information.

**Box 2: Medicines which increase falls risk**

- Antidepressants
- Antihypertensives
- Antiparkinsonians
- Diuretics
- Hypnotics
- Sedatives

**Further information**

- Online Fracture Assessment tools:
  - WHO Fracture Risk Assessment tool (FRAX). Available at: [http://www.shef.ac.uk/FRAX/](http://www.shef.ac.uk/FRAX/)

Full reference list available at: [www.veteransmates.net.au](http://www.veteransmates.net.au)
Over the next few months, accredited pharmacists may receive Home Medicines Review (HMR) referrals as a result of the latest release of Veterans’ MATES. This latest release aims to improve the detection and management of osteoporosis.

Few falls have a single cause and multifactorial assessment, including medicines review and assessment of home environment, can help to prevent fractures in patients with osteoporosis. Therefore, we have highlighted to GPs where patients with osteoporosis are receiving medicines that may increase their risk of falls and have asked them to consider a HMR for these patients.

When you do receive such a referral, consider the below points as part of your review process. The patient’s GP will value concise feedback that includes any education provided to the patient and your assessment of whether any medicines appear to be contributing to their risk of falls. If no problems are identified from the HMR, this positive result is just as important to feed back to the GP.

The patient will have received a veterans’ brochure, encouraging them to learn about osteoporosis and ask their doctor for a HMR, particularly if they have recently started treatment or as part of falls prevention measures.

Copies of the therapeutic brief, veteran brochure and this document (including the preliminary fall risk screening tool) are available on the Veterans’ MATES website.

HMRs can improve health outcomes for members of the veteran community. Thank you for your work with veterans and we hope this information will help you respond to a GP’s HMR referral for patients with osteoporosis.

## Preliminary fall risk screening*

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Level</th>
<th>Risk Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recent falls</strong></td>
<td>none in last 12 months</td>
<td>2</td>
</tr>
<tr>
<td>(with or without hospitalisation)</td>
<td>one or more between 3 and 12 months ago</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>one or more in last 3 months</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>one or more in last 3 months whilst inpatient/resident</td>
<td>8</td>
</tr>
<tr>
<td><strong>Medications</strong></td>
<td>not taking any medications known to increase risk of falls</td>
<td>1</td>
</tr>
<tr>
<td>(Sedatives, Antidepressants, Antiparkinsonians,</td>
<td>taking one medication known to increase risk of falls</td>
<td>2</td>
</tr>
<tr>
<td>Diuretics, Antihypertensives, Hypnotics)</td>
<td>taking two medications known to increase risk of falls</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>taking three or more medications known to increase risk of falls</td>
<td>4</td>
</tr>
<tr>
<td><strong>Psychological</strong></td>
<td>does not appear to have any of these</td>
<td>1</td>
</tr>
</tbody>
</table>
| (Anxiety, Depression, 
| Cooperation, 
| Insight or 
| Judgement esp. re mobility)             | appears mildly affected by one or more                              | 2          |
|                                                  | appears moderately affected by one or more                           | 3          |
|                                                  | appears severely affected by one or more                            | 4          |
| **Cognitive status**                             | intact                                                               | 1          |
|                                                  | mildly impaired                                                      | 2          |
|                                                  | moderately impaired                                                  | 3          |
|                                                  | severely impaired                                                    | 4          |
| (Low Risk: 5-11)                                 | (Medium Risk: 12-15)                                                | (High Risk: 16-20)                                             |
| **RISK SCORE:**                                  | /20                                                                 |            |

**Automatic High Risk Status:** (if ticked then circle HIGH risk below)

- Recent change in functional status and/or recent change in medications affecting safe mobility (or anticipated)
- Dizziness/postural hypotension

**FALL RISK STATUS:** LOW / MEDIUM / HIGH

*The screening tool has been adapted from the Falls Risk Assessment Tool (FRAT) developed by Peninsula Health Falls Prevention Service. Tool validated in sub-acute and residential care setting (average age 79 years, 80% prediction accuracy of faller status).

### Further information

- Peninsula Falls Risk Assessment Tool
- Falls Prevention Guidelines from the Australian Commission on Safety and Quality in Health Care

- For further information about medicines which increase falls risk, see therapeutic brief 20 *Reviewing medications to reduce the risk of falls*
- For further information for veterans about falls and how to prevent them, see the DVA booklet *HomeFront guide to preventing falls for older people*
Topic 28
Osteoporosis – Identifying and treating at risk patients

Full reference list for Therapeutic Brief


