In order to reduce or prevent bone loss, it is vital to maintain an adequate intake of calcium. Osteoporosis Australia continues to recommend a total daily calcium intake of 1,000-1,300 mg per day, depending on age and sex, and ideally obtained from calcium rich foods in the diet. However, when dietary intake of calcium is not sufficient, supplements may be required at a daily dose of around 500-600 mg per day. Calcium supplementation has also been an integral component of clinical trials with prescription medicines used to treat established osteoporosis.

### Calcium requirements

The NHMRC Nutrient Reference Values (NRV) outline total calcium recommended per day. These requirements take into consideration factors such as calcium excreted from the body (and some calcium not properly absorbed) to ensure adequate intake for the majority of the population.

### Calcium in food

An average diet should include 3-5 serves of calcium rich food daily.

The number of serves is determined by calcium content.

### Calcium content of key foods

<table>
<thead>
<tr>
<th>Food</th>
<th>Calcium (mg per standard serve)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk, cheese and yoghurt</td>
<td>300-400 mg</td>
</tr>
<tr>
<td>Tinned salmon and sardines</td>
<td>220-400 mg</td>
</tr>
<tr>
<td>Tofu-calcium set</td>
<td>150 mg</td>
</tr>
<tr>
<td>Nuts and tahini</td>
<td>65-110 mg</td>
</tr>
<tr>
<td>Selected green vegetables</td>
<td>18-43 mg</td>
</tr>
</tbody>
</table>

Source: extrapolated from FSANZ database with cross reference to Foodworks and Calorie King.

Dairy products are a rich source of calcium (including reduced fat and low fat options). A simple way to ensure sufficient calcium intake is to include 3 serves per day of dairy foods such as milk, cheese or yoghurt.

People who are intolerant to lactose (not allergic) can often tolerate yoghurt and cheese as the lactose has been broken down in these products.

Individuals who are intolerant of dairy products or dislike dairy products will need to incorporate more serves of other high calcium containing foods (eg: specific vegetables, fish and nuts) or calcium fortified foods.

Calcium fortified foods and beverages are available (eg: some cereals, calcium set tofu, soy beverages).

### Supplementation

Calcium (and vitamin D) supplementation has been shown to be effective in people who do not get enough dietary calcium (and/or sunlight for vitamin D). Lack of adequate calcium and vitamin D over prolonged periods may negatively impact on bone health. Elderly people, in particular, often find it difficult to achieve adequate sources of these nutrients and may benefit from supplementation.

Calcium supplementation may be required in the following situations:

- People with insufficient dietary calcium intake. Osteoporosis Australia recommends a supplement of 500-600 mg per day when dietary intake is low.
- People taking osteoporosis treatments. Calcium supplementation optimises the effectiveness of most osteoporosis medicines including bisphosphonates, strontium ranelate, denosumab, teriparatide and SERM therapy. It is recommended that calcium supplementation be combined with vitamin D.

For more information call our national toll-free number 1800 242 141
Visit our website www.osteoporosis.org.au
Safety of calcium supplements

Several recent studies (and subsequent media reports) have raised debate around the safety of calcium supplements and possible increased risk of cardiovascular events. Osteoporosis Australia has reviewed these studies and issued a statement about the use of calcium supplementation based on current evidence (www.osteoporosis.org.au).

When dietary intake is inadequate, Osteoporosis Australia continues to recommend calcium supplementation to assist patients in reaching overall recommended intake of 1,000-1,300 mg per day (depending on age). Calcium supplementation in doses of 500-600 mg per day is considered safe and effective.1

Calcium and bone density

Numerous studies have been conducted on the effect of calcium supplementation (with or without vitamin D supplementation) on bone mineral density and bone turnover. Most studies indicate a moderate but positive (statistically significant) effect on post-menopausal bone loss.2,7 These effects were more pronounced in people with low dietary calcium intake.

Supplementation and fracture prevention

Some randomised controlled trials have shown supplementation with calcium and vitamin D to be effective in reducing fracture risk in the elderly. This is most likely to relate to the fact that many elderly people tend to be deficient in both calcium and vitamin D.3,5,10,11 For people who have osteoporosis whether or not they have experienced a fracture, calcium alone (or vitamin D alone) is not sufficient to prevent future fractures.12,13 GPs must consider anti-osteoporotic treatments for those at high risk of fracture. However, adjuvant supplementation of osteoporosis medicines with calcium and vitamin D is strongly recommended.

Calcium and ageing

Calcium requirements increase with age (1,300 mg per day for women over 50 and men over 70) as elderly persons can be at increased risk of calcium (and vitamin D) insufficiency. The main factors to monitor in people with advancing age are reduced calcium intake or poorer calcium absorption, for example:

- Reduced dietary intake of calcium, usually part of decreased overall dietary energy intake (poorer appetite, other illnesses, social and economic factors).
- Decreased intestinal absorption of calcium (exacerbated if vitamin D status is low).
- Less frequent exposure to sunlight hence poorer vitamin D status (eg: elderly who are housebound, institutionalised, or have reduced mobility).
- Decreased capacity of the skin to synthesise vitamin D.
- Decreased efficiency of the kidneys to retain calcium, leading to increased calcium loss in the urine and/or
- Decreased capacity of the kidneys to convert vitamin D into its most active form, 1,25-dihydroxyvitamin D.

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