Based mainly on calcium balance studies, the target calcium intake from dietary sources and supplements should be 1000 mg per day for adults, rising to 1300 mg per day for women aged >50 years and men aged >70 years.[3,8,32] Vitamin D from sunlight exposure (with more sun protection and limited time outdoors for people at high risk of skin cancer and less protection and more time outdoors for those with dark skin at low risk of skin cancer[24]) or, if sun exposure is very limited, supplements should ensure serum 25(OH)D concentrations >50 nmol/L.[8] Although the middle of the day has the highest UV overall, so skin damage may occur in a very short time, it is also when the ratio of UVB (needed for vitamin D synthesis) to UVA (which damages the skin and does not produce vitamin D) is highest.[17,24]

If vitamin D supplements are required to achieve target serum 25(OH)D concentrations of >50 nmol/L as recommended,[8] a dose of 800–1000 IU per day is usually sufficient, although higher doses are needed in some people.[17,18,28] Dietary calcium intake is often suboptimal in older people, especially institutionalised individuals.

Calcium and vitamin D supplements work together by reducing secondary hyperparathyroidism and bone turnover. BMD is also increased by calcium and vitamin D, but this effect appears modest. Calcium and vitamin D are not available on the PBS, but are recommended for people likely to have insufficient intakes. This is particularly important for those taking other osteoporosis therapies.

Calcium supplements are available in two common forms: calcium carbonate and calcium citrate. Calcium tablets typically contain 250–600 mg of elemental calcium. The most commonly available type of vitamin D supplement is vitamin D3 or cholecalciferol. Vitamin D3 elevates serum 25(OH)D concentrations more than vitamin D2 or ergocalciferol and is more reliably measured by commercially available assays. Currently available doses of vitamin D range from 400 to 1000 IU, available as capsules, tablets or liquid formulations.

Side effects and potential harms

Calcium supplements modestly increase the risk of renal calculi.[39] Calcium supplements can also cause abdominal bloating and constipation.[39] It has been reported there could be an increased risk of myocardial infarction with calcium supplements,[40] but not all studies support this conclusion.[41] Calcium and vitamin D supplements do not increase the risk of death and some studies suggest a small reduction in the risk of death.[41]

Clinical toxicity is uncommon with vitamin D, even at high doses. Single doses of up to 500,000 IU are tolerated without causing hypercalcemia or hypercalciuria. However, the use of higher-dose formulations of vitamin D in older people has been associated with an increased risk of falls. Overall, daily, or at most, weekly vitamin D supplements are preferred.[31]