

# RGH Pharmacy E-Bulletin

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A joint initiative of the Patient Services Section and the Drug and Therapeutics Information Service of the Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia. The RGH Pharmacy E-Bulletin is distributed in electronic format on a weekly basis, and aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications.

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## Vitamin D deficiency (part one) – evidence, symptoms & who to test

Vitamin D is required for optimal calcium absorption and thus is important for bone health. Vitamin D supplementation, in conjunction with adequate calcium intake, can reduce the risk of hip and non-vertebral fractures in the elderly, particularly in those without prior hip fracture in residential aged-care. In addition, adequate vitamin D levels improve muscle strength and stability, and reduce the risk of falls.

About 90% of bioavailable vitamin D<sub>3</sub> (cholecalciferol) is derived from direct sun exposure. Exposure of the hands, face and arms to around one-third of the minimal erythemal dose (MED, or the amount of sun exposure that produces a faint redness of the skin) produces approximately 1000 IU of cholecalciferol. The length of sun exposure to produce 1/3 MED varies with latitude, season, time of day, and skin pigmentation. For example, fair-skinned people in Adelaide need exposure to direct sunlight (hands, face and arms without sun screen and not behind glass) for 5–7 minutes on most days in summer (at around 11 am or 3 pm daylight savings time) and 25–38 minutes at the same times in winter. People with highly pigmented skin require 3–6 times longer exposure times.

Vitamin D deficiency is prevalent in Australia. Moderate to severe vitamin D deficiency (serum 25 hydroxyvitamin D<sub>3</sub> (25-OHD) levels < 25 nmol/l) was reported in 22% of residents in low-level residential aged-care and 45% of residents in high level aged-care in one Australian study. In a study in south-east Queensland, 23% of the general population were found to be at least mildly vitamin D deficient (25-OHD level < 50 nmol/L).

Symptoms of vitamin D deficiency include muscle weakness, fatigue and muscle pain. Vitamin D deficiency is a common cause of undiagnosed muscle pain. Some studies have suggested a link between vitamin D deficiency and a number of other conditions (e.g. increased risk of some cancers, heart disease, type 1 diabetes, multiple sclerosis, and some mental health conditions). Further research into these associations is clearly warranted.

### *Who to test?*

It is recommended that serum 25-OHD levels should be measured in groups at risk of vitamin D deficiency, such as the following:

- all patients with low trauma fracture or suspected osteoporosis;
- patients with non-specific musculoskeletal symptoms;
- any patients with clinically relevant risk factors for vitamin D deficiency (e.g. people who are elderly, avoiding sun exposure, dark-skinned or veiled for cultural reasons; people with chronic kidney, liver or small bowel diseases; people treated with anticonvulsants).

A consensus statement published in the Medical Journal of Australia in 2006 also advised that vitamin D levels should be tested for all women during the first trimester of pregnancy, especially those who are veiled or dark-skinned.

A further E-Bulletin (next week) will discuss issues related to vitamin D treatment.

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