

## ? The solution

It is now 12 years since a French randomised controlled trial on some 3,000 women in residential care showed that the daily administration of 800 units of vitamin D3 with 1200 mg of calcium reduced the hip fracture rate by 43% in 18 months [8]. This important finding has not yet been systematically applied in any western country but the Department of Health is now seeking to implement it in South Australia. Our policy is to ensure that everyone in residential care in South Australia receives 1000 units of vitamin D3 and 600-1200 mg of calcium daily and that all community-dwelling individuals over 65 years have their vitamin D status checked. The thousand units of vitamin D can be obtained from a twice daily tablet of "Ostelin Vitamin D and Calcium" (giving 1200 mg of calcium as the carbonate) or a twice daily tablet of "Citracal + D" (giving 630 mg of calcium as the citrate). If calcium is contraindicated for any reason, the same 1,000 units of vitamin D3 can be obtained from 1 tablet of "OsteVit-D" or "Ostelin Vitamin D" or other equivalent preparations.

**We strongly recommend that vitamin D3 1,000 IU with calcium be provided to everyone living in residential care in South Australia and that vitamin D3 in the same dose (with calcium if indicated) be provided to community-dwellers with serum 25-hydroxyvitamin D levels below 50 nmol/L. We hope that all parties involved in the care of the elderly in South Australia will cooperate in implementing this programme.**

## Selected references

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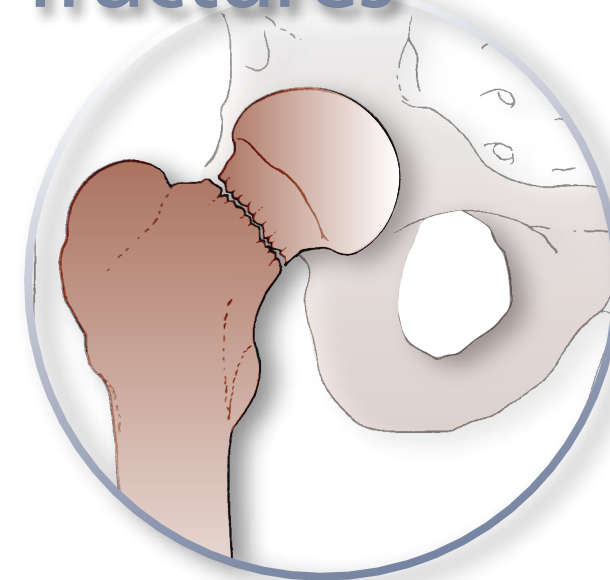
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Government of South Australia  
Department of Health

# Vitamin D deficiency, falls & hip fractures



Recommendations of a South Australian  
Department of Health Working Party

# Vitamin D deficiency, falls & hip fractures

## The problem

**It is well-known that fracture rates rise with age in western countries due to the progressive development of osteoporosis, particularly in women. The most significant of these fractures, both from the point of view of society and of the individual, is that of the hip; more than 2,000 hip fractures occur each year in South Australia and the number has been increasing annually with the ageing of the population.**

## The background

**I**t has been known for 30 years that vitamin D deficiency is common in patients with hip fracture in Europe [1] and it has been known for 20 years that the same is true in South Australia [2]. It has also been known for the same length of time that a high proportion of South Australian hip fracture cases come from residential institutions, where hypovitaminosis D is almost universal [2].

**T**hese observations reflect a general decline in vitamin D status with age in virtually all western countries, including Australia, where such measurements have been made. This is due to decreasing exposure to the sun with advancing age and to the declining capacity of the ageing skin to synthesise vitamin D in response to sunlight [3]. All the evidence now tells us that it is the elderly subjects with the lowest serum vitamin D levels who are at greatest risk of hip fracture.

## The explanation

**T**here are at least four reasons why vitamin D deficiency is a risk factor for fractures in general and hip fractures in particular.

- 1** The first is that loss of the action of vitamin D on muscle increases body sway and so increases the risk of falling [4].
- 2** The second is that secondary hyperparathyroidism, due to loss of the bone-resorbing action of vitamin D, increases the rate of bone turnover [5], which is itself an independent risk factor for fracture [6].
- 3** Thirdly, this same secondary hyperparathyroidism destroys bone and so aggravates osteoporosis.
- 4** And finally, the decline in the calcium and phosphate levels in the blood and tissue fluid leads to a progressive failure of bone mineralisation (osteomalacia) [7] and consequent weakening of the bony tissue itself.

**All these effects of vitamin D deficiency have been shown to be reversible with administration of vitamin D in physiological doses.**