

Calcium – dietary and supplemental.

Calcium carbonate (usual tablet size 600mg of available calcium) is poorly soluble and poorly absorbed, except in the presence of acid.

In Adelaide, there is a tradition, based on a research protocol from the 1960s, of taking calcium at bedtime. More calcium would be absorbed if calcium carbonate were taken with the evening meal, which triggers stomach acid secretion. Patients on proton pump inhibitors should consider calcium citrate. Unabsorbed calcium may cause constipation.

Calcium citrate (equivalent tablet size 250mg) is extremely well absorbed. It can be useful in patients on PPI drugs or ranitidine or those who become constipated on calcium carbonate (a few patients get constipated with either).

The calcium carbonate in CalviD (also included in the Actonel Combi D package) is mixed with sodium citrate. By the time it stops fizzing in a glass of water, it is a very large dose of calcium citrate.

Very high calcium intake may be harmful. Reid, in New Zealand, randomized patients to 1000mg daily of calcium citrate, regardless of their existing dietary calcium intake. These patients showed an increase in serious cardiovascular events. A population study in Scandinavia showed an increased rate of CV deaths in patients who received calcium supplements on top of an existing daily dietary intake of >1400 mg. Paradoxically, there was also a higher death rate in patients with an intake of < 600 mg

Dietary calcium estimation is easy. Each of the following equates to 300mg of calcium: a glass of milk; a 200mL tub of yoghurt; 75g of cheese; two tubs of cottage cheese; a tin of sardines; a tin of salmon (if you chew the bones). There is very little calcium in a tin of tuna. Or put this calculator in your browser Bookmarks or Favourites.

http://www.abc.net.au/health/quizzestools/tools/2008/09/30/calcium_quiz.htm

I give 600-1200 mg of supplemental calcium carbonate (500mg of citrate) in patients with severely depleted diets (less than 300mg daily) and 600mg (250mg) if taking 300-600mg daily in their diet. I accept a dietary intake of 900mg in pre-menopausal patients. In patients who are post-menopausal, obligate daily urine loss of calcium is higher and one should consider supplements more strongly. The decisions are more complex in patients with renal failure, hyperparathyroidism, hypercalciuria or previous stones; or those with high vascular risk. A quick test of urinary calcium excretion is to measure the calcium/creatinine ratio in a second-void fasting urine specimen.

Other calcium supplements exist, for example calcium orotate; and some supplements come mixed with magnesium, boron and other minerals. There is almost no evidence base to support their use; and no evidence base to assess their adverse effects. This makes their claims/prices hard to justify.

Vitamin D supplements.

There is good evidence of safety in doses of 1000 to 2000 units (25 – 50 mcg) per day. Very large doses (500,000 units) may increase fractures during the first few months. Doses between those extremes are ineffective but have no evidence base for safety. Doses below 800 IU per day are ineffective in elderly.

Name	Form	Dose	Est. cost per 1000 IU
Ostevit D	liquid	5000 IU/ml	10 c
Ostevit D	capsule	1000 IU/capsule	13 c
Ostelin	tablet	1000 IU/tablet	18 c
Blackmore's vitamin D	tablet	1000 IU/tablet	16 c

Vitamin D in oil is compounded from a powder that is degraded by heat, moisture or light. Unless the pharmacy is creating a lot of doses per week, and keeping a tight lid on the tin, that powder (or oil) may contain much less Vitamin D than one might think.

Calcium Supplements mixed with Vit D

Without calcium, Vitamin D is not effective at slowing bone loss; and vice versa. The ratios of calcium and Vitamin D vary with subtle changes in brand name. I tend to stick with one or two brands, to keep my life simple. Some patients find cheaper but unfamiliar brands. "Alternative" products usually contain highly variable calcium content and clinically ineffective quantities of Vitamin D.

Type of calcium	Name	Vit D (units/mcg)	Available Calcium (mg)	Comment
Carbonate	Ostevit D with calcium One A Day	1000 (25)	600	Chewable
	Ostevit-D & calcium	500 (12.5)	600	
	OstelinVit D & calcium Plus	1000 (25)	600	A variety of other minerals
	Caltrate Plus D	500 (12.5)	600	
	Calsup Chewable Vit D plus Calcium	500 (12.5)	600	Chewable. Peppermint or chocolate.
	Calcia 1000mg calcium & Vit D 800 IU	800 (20)	1000	Lemon flavour PKU beware
	Calcia Calcium 500mg + Vit D 400 IU	400 (10)	500	As above
	Blackmore's Cal D	500	600	
	Cal 600 + D	500	600	
	Calvid	880 (22)	>1000	Described as carbonate
Citrate	Citracal Plus D	500 (12.5)	300	

Financial interest: WJB won a computer in a raffle conducted by the distributors of the Ostevit range!