

Recommendations For Calcium Supplementation In Primary Care (Incorporating Concerns Regarding Cardiovascular Risk)

Purpose of this document

There are concerns that calcium supplements, with or without co-administered vitamin D, may be associated with an increased risk of myocardial infarction and possibly stroke. However, data are conflicting and this association has not been confirmed in a randomised controlled trial. The studies were not powered to detect differences in cardiovascular outcomes. The relationship between calcium consumption and cardiovascular events appears to be non-linear suggesting the relationship may be weak or there is no link.

There is currently insufficient evidence to recommend a change from current guidelines regarding calcium supplementation.

Background information

Calcium with co-administered vitamin D is more effective than placebo, no treatment, or vitamin D alone for reducing the risk of hip fractures in older people. For elderly people living in a nursing home or residential care home, treatment can reduce the risk of both hip and non-vertebral fractures.

Patients treated with bisphosphonates in clinical trials used concomitant calcium and vitamin D supplements. NICE recommends supplementation with calcium and vitamin D for all patients who are taking bisphosphonates (and other bone sparing agents) unless adequate intake can be confirmed.

Postmenopausal women should aim for a dietary intake of 1000mg calcium per day. The richest natural sources of calcium are milk, yoghurt and hard cheeses. White bread, sardines and calcium fortified soya milk are also good sources of calcium. Butter, cream and soft cheeses are poor sources of calcium. Please see the calcium calculator at the end of this document for further information. Please note: individuals may over- or under-estimate their calcium intake.

Increasing dietary intake of calcium and vitamin D is preferable to taking supplements. Calcium supplements are a means of ensuring an adequate calcium intake in those unwilling or unable to do so by dietary means. A daily calcium supplement of 1000mg is likely to reduce fracture rates by a similar rate to that seen with similar levels of dietary derived sources of calcium.

Approximately 90% of vitamin D requirements are achieved by the action of sunlight on the skin during the summer months. The remaining 10% is obtained from dietary sources including fortified margarines and cereals, egg yolk and oily fish. During the winter months in the UK, vitamin D is only available from the diet, and there is a risk of insufficiency and deficiency.

Vitamin D alone has not been shown to reduce fractures, although it has been shown to reduce the incidence of falls.

There is no evidence that vitamin D supplementation is needed for active people under 65 years of age. However, the Department of Health recommends everyone over 65 years of age should aim to take 10mcg (400 IU) daily of vitamin D. For the majority of people this can only be achieved by vitamin D

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supplementation. The DoH advises that individuals should be advised to purchase vitamin D supplements at the appropriate strength. These products are unlicensed but due to the lack of evidence in this area it is difficult to justify supply on prescription. Where vitamin D deficiency has been confirmed or is likely, such as in the case of housebound individuals, a vitamin D supplement of 20mcg (800 IU) is recommended.

Prescribing calcium supplements

In view of inconclusive evidence, prescribers need to balance the potential benefits of calcium supplementation on bone health with the potential harms of cardiovascular risk on an individual patient basis when deciding whether to prescribe calcium supplements.

Frail, housebound and care home residents

Frail, housebound and care home residents are unlikely to achieve adequate dietary calcium and vitamin D intake and are therefore at increased risk of calcium and vitamin D deficiency.

For people over 65 years of age and people of any age not exposed to much sun, who have an adequate dietary calcium intake of more than 1000mg/day, prescribe vitamin D without a replacement dose of calcium.

For people who do not have adequate dietary calcium intake, prescribe supplemental calcium and vitamin D, or vitamin D alone where the patient is judged to be at higher cardiovascular risk.

Other patients

Advise adequate dietary intake of calcium and vitamin D including safe exposure to sunlight. Assess dietary calcium intake. If this is judged to be adequate, calcium supplementation is not required. Provide dietary advice to ensure adequate calcium is obtained in the diet. Where it is not possible to achieve sufficient dietary calcium consider calcium supplementation with vitamin D bearing in mind potential cardiovascular risk. Where the patient is judged to be at higher cardiovascular risk, consider supplementary vitamin D with dietary calcium advice.

Patients being prescribed a pharmaceutical treatment for osteoporosis should have their calcium and vitamin D intake assessed and, if found to be inadequate, have supplemental calcium and vitamin D or vitamin D alone prescribed where the patient is judged to be at higher cardiovascular risk.

Secondary Prevention in osteoporosis and osteoporotic fractures (this guidance does not cover specific osteoporosis treatments)

Prescribe a pharmaceutical treatment in accordance with Kent and Medway Osteoporosis Group recommendations. Patients prescribed osteotherapy should generally have calcium and vitamin D co-prescribed. Assess calcium intake. Provide dietary advice to ensure adequate calcium is obtained in the diet. Where it is not possible to achieve sufficient dietary calcium consider calcium supplementation with vitamin D bearing in mind potential cardiovascular risk. Where a patient is at higher risk of CVD consider prescribing vitamin D alone and provide advice on adequate dietary calcium intake.

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Prescribing Calcium and Vitamin D

Routine testing for albumin corrected serum calcium level should be undertaken in all individuals commencing calcium supplementation and treatment should only be commenced if levels are low or within normal range i.e. there is no evidence of hypercalcaemia.

Concordance

Before prescribing a calcium and vitamin D preparation ensure that the individual understands why the supplement is needed and that he or she is prepared to use the product. Many individuals find chewable and soluble preparations less palatable than caplets or film coated tablets.

Associated documents

1. Kent and Medway Osteoporosis Group (KMOG) Osteoporosis Recommendations
2. Kent Surrey and Sussex Health Policy Support Unit Model Guidance: Prevention, investigation and treatment of vitamin D deficiency and insufficiency.
3. NICE guidelines and guidance <http://pathways.nice.org.uk/pathways/osteoporosis>.

References

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6. Chung M, Balk EM, Brendel M, et al. Vitamin D and calcium: a systematic review of health outcomes. *Evid Rep Technol Assess (Full Rep)* 2009:1–420.
7. Chapuy MC, Arlot ME, Duboeuf F, et al. Vitamin D3 and calcium to prevent hip fractures in the elderly women. *N Engl J Med* 1992;327:1637–42.
8. SIGN Guideline No. 71 Management of Osteoporosis (June 2003 Updated April 2004)
9. NICE Clinical Knowledge Summary Osteoporosis – Prevention of Fragility Fractures

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Calcium Calculator (from SIGN 71 Management of Osteoporosis)

	Portion	Calcium (mg)
Dairy milk		
Milk (all types)	200 ml glass	240
Milk pudding	200 g bowl	260
Ice-cream (dairy)	60 g/2 oz	60
Cheese & yoghurt		
Plain yoghurt	125 g pot	250
Fruit yoghurt	125 g pot	170
Hard cheese e.g. Cheddar, Edam	30g/1 oz	225
Softer cheese e.g. Brie	30 g/1 oz	80
Macaroni cheese	200 g/7 oz	340
Cheese & Tomato Pizza	170 g/6 oz	450
Confectionery		
White chocolate	50 g bar	140
Milk chocolate	50 g bar	110
Liquorice allsorts	50 g pkt	90
Bread & Cereals		
White bread (sliced)	4 x 30 g slices	200
Wholemeal bread	4 x 30 g slices	120
Nutrigrain	40 g bowl	220
Calcium fortified cereals e.g. Coco-pops; Rice Krispies; Cheerios	30 g bowl	140
Soya-milk products		
Soya milk (plain)	200 ml glass	26
Soya milk + calcium	200 ml glass	180
Soya fruit drink + calc*	330 ml	400
Soya yoghurt + calc*	125 g pot	125
Fish		
Sardines in oil	60 g/2 oz	300
Pilchards (canned)	60 g/2 oz	150
Fish paste	60 g/2 oz	170
Salmon (canned)	60 g/2 oz	50
Vegetables		
Tofu (steamed)	60 g/2 oz	300
Spinach (boiled)	90 g/3 oz	130
Baked beans	150 g/5 oz	80
Nuts & Seeds		
Tahini (sesame) paste	30 g/1 oz	200
Almonds	30 g/1 oz	70
Fruit & Fruit Juice		
Concentrated orange juice (unsweetened)	200 ml cup	70
Oranges	1 average	70
Figs (ready to eat)	30 g/1 oz	70

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