

## (Preventing) two birds with one stone: improving vitamin D levels in the elderly

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### ABSTRACT

**BACKGROUND AND CONTEXT:** A majority of adults have sub-optimal vitamin D levels in the winter in southern New Zealand. This is associated with an increased risk of falls and fragility fractures in the elderly, with long-term adverse outcomes likely. Vitamin D supplementation decreases the risks of both falls and fractures.

**ASSESSMENT OF PROBLEM:** An intervention was undertaken by a small urban general practice to increase the number of elderly patients receiving vitamin D supplementation by linking vitamin D prescription to the annual flu vaccination campaign.

**RESULTS:** Uptake of the supplementation was high and costs to the practice low. Thirty-eight patients were identified for whom long-term supplementation with vitamin D was indicated.

**STRATEGIES FOR IMPROVEMENT:** The study could have been strengthened by incorporating a more formal method of evaluating uptake.

**LESSONS:** Encouraging patients to take supplements as a population-based strategy is a realistic intervention, and linking it to the flu vaccination campaign is both seasonally appropriate and efficient.

**KEYWORDS:** Vitamin D deficiency; elderly; vitamin D supplementation; cholecalciferol; prevention; fragility fractures; intervention

### Background

Increasingly it seems that vitamin D is going to be the aspirin of the 21st century—good for everything that ails you. The evidence for vitamin D supplementation reducing fragility fractures and falls in the elderly is clear.<sup>1,2</sup> Epidemiological evidence shows those with the highest quintile of vitamin D levels have the lowest incidence of several cancers and heart disease, although there is no evidence to date that supplementation influences this.<sup>3</sup> While it is known that a high proportion of adults who live in southern New Zealand have low vitamin D levels, particularly in the winter, there is still debate about optimal serum levels of vitamin D.<sup>4</sup> Although vitamin D levels of at least 50 nmol/L are widely recommended, definitions of vitamin D deficiency are vari-

able. There is some evidence that the optimal level to maintain bone health may be as high as 75–80 nmol/L.<sup>5,6</sup> One study in adults in Canterbury (n=201) found 35% of subjects were vitamin D deficient (<25 nmol/L) and 89% were vitamin D insufficient (<50 nmol/L) in July and August of 2004.<sup>7</sup> Vitamin D deficiency is more common in dark-skinned individuals, the elderly, and those who cover the skin, for example for religious reasons.<sup>8</sup>

Accident Compensation Corporation (ACC) is currently funding universal vitamin D supplementation for elderly patients in residential care, as the evidence for benefit in this group is the strongest.<sup>9</sup> However, we felt that there is sufficient evidence of benefit to consider offering vitamin D supplementation through the winter

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months to all our patients over 65 years old.<sup>10</sup> Since we run an active recall system for all these patients for flu vaccination in autumn, it seemed opportune to combine these two strategies.

## Method

Before beginning this intervention, the endocrinology department at Dunedin Hospital was consulted, to discuss concerns about safety, contraindications and potential drug interactions. It was established that providing six tablets all at once with instructions to take one tablet per month was a safe and effective dose.<sup>11</sup>

The query builder on the MedTech system was used to identify patients of 65 years and above, and a letter was printed for each outlining the benefits of vitamin D supplementation (available as an Appendix in the web version of this paper.) These letters were then given to the patient's general practitioner (GP), who checked the clinical record to see if they were already taking vitamin D supplementation or had any contraindications to its use. Patients were excluded if they were taking calcitriol, using calcipitriol, or if they had previously had elevated PTH, phosphate or calcium. This was a relatively labour-intensive part of the process for the GPs. It was recognised that there was a potential interaction with thiazide diuretics, but this was not felt to be a contraindication to the use of cholecalciferol. The four local pharmacies were notified of the initiative, to ensure they held sufficient stocks of cholecalciferol.

The GP then generated a prescription for six tablets of cholecalciferol 1.25 mg for appropriate patients, with the instructions "one per month, or as directed". The prescription was then stapled to the letter which specified the dose that should be taken and the pile passed back to be held at reception in alphabetical order.

As each patient came in for their flu vaccine, they were given their letter and prescription to read while they were waiting to see the practice nurse or GP. Any immediate questions or concerns about taking vitamin D supplements could then be discussed with their clinician.

## WHAT GAP THIS FILLS

**What we already know:** Vitamin D levels in older adults are sub-optimal in southern New Zealand in the winter. Vitamin D supplementation reduces falls and fragility fractures, but only a minority of elderly patients receive supplementation.

**What this study adds:** A simple, cost-effective intervention at an individual practice level to increase uptake of vitamin D supplementation in the elderly.

## Ethical approval

One of the authors was a member of the Lower South Region Health and Disability Ethics Committee. After consultation with the Ethical Guidelines for Observational Studies it was felt that Ethics Committee Review was unnecessary as the activity would be classed as an audit or related activity which did not involve a departure from normal care nor reach any other threshold of risk of harm.<sup>12</sup>

## Outcome

There were 550 patients in the eligible age group enrolled with the practice. Excluding those who were already taking some form of vitamin D supplementation or who had some contraindication

Figure 1. Patients for vitamin D supplementation

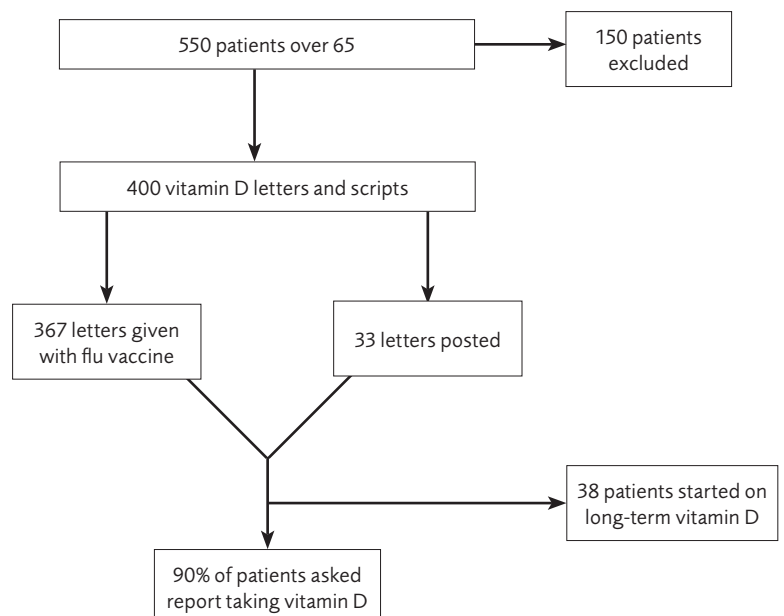


Table 1. Estimated cost of intervention

Estimated costs	
GP 9 hours @ \$110 per hr	\$990.00
Reception 2.5 hours @ \$20 per hr	\$50.00
Stationery	\$300.00
<b>Total cost</b>	<b>\$1340.00</b>

to its use, there were 400 patients to whom letters and prescriptions were generated. Three hundred and sixty-seven patients were given these letters at the time of flu vaccine. The remaining 33 either declined flu vaccine or were missed when they attended, and their letters were posted out to them (see Figure 1).

Around 30% of patients were asked at their next visit whether they had the prescription filled and were taking the tablets. The majority were taking them, and all of those were taking them correctly once per month. The most likely group to decline to take the supplement were the youngest, most active patients, who felt their outdoor lifestyles provided them with sufficient vitamin D. The feedback from the patients was universally positive. The study could have been strengthened by incorporating a more formal method of evaluating uptake.

An unexpected outcome was that 38 patients were identified for whom long-term supplementation with vitamin D was indicated, and these patients were started on vitamin D with the intention of continued use. Indications for long-term use included risk factors for osteoporosis (low body weight, smoking, family history of osteoporosis, inactivity, low sun exposure, long-term corticosteroid use) increased risk of falling, established osteoporosis or a history of fragility fracture.

### Lessons and messages

Potential benefits from vitamin D supplementation are becoming well established, and the risk of harm is extremely low. Encouraging patients to take supplements as a population-based strategy is a realistic intervention, and linking it to the flu vaccination campaign is both seasonally appropriate and efficient. There were costs to the practice in terms of time spent by both clinical and support staff, and stationery expenses (see Table 1), and

these were not able to be recouped from either the patients or other sources of revenue. Checking the clinical record of each patient took a significant amount of time for the GPs, although the patient population is very stable and the patients were generally well known to their doctor. An attempt to streamline this process by using the MedTech query builder to identify patients with contraindications or previous vitamin D prescription was made, but did not identify all such patients.

This intervention was not designed to detect decreased fracture risk or other benefits of vitamin D for patients, since these are well established. It is described here as an exemplar for other practices of how to structure an intervention to increase uptake of vitamin D supplementation in an at-risk population.

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### COMPETING INTERESTS

None declared.

## APPENDIX A

Dear .....

**re: VITAMIN D supplements**

We believe that it would be beneficial for you to take extra vitamin D over the winter. There is good evidence that it helps to strengthen bones, thus reducing the number of broken bones you might sustain and also helps to prevent the development of other conditions. There is also good evidence that most of us living in the south of the South Island have low vitamin D levels during the winter months. People in your age group are most susceptible to sustaining broken bones and so we would like to offer you the opportunity to take vitamin D supplements over the winter. We encourage you to read the enclosed leaflet and to consider taking vitamin D over the winter

**The recommended dose is 1 tablet per month and we would recommend that you choose the same day of the month to help you to remember when to take it.** We enclose a prescription for 6 tablets which you should take to your pharmacy or if you wish, we could fax it to them.

At this dose, vitamin D is a very safe medication, although if you are already on cholecalciferol (vitamin D tablets) or other form of vitamin D supplements from any source, you will not need to take any more.

If you have any questions about this medication or wish to confirm that it is suitable for you, please contact me or one of the practice nurses.

Yours sincerely

Dr ..... and the team at ..... Health Centre