1 Prescribing Guidance for Calcium & Vitamin D3 Prescribing

Calcium and Vitamin D3 supplements are recommended in the prevention and treatment of osteoporosis/fractures. Adcal D3 caplets and TheiCal-D3 tabs are the formulary choices and provide the recommended daily doses. This audit will highlight patients eligible for switching to the formulary choice and those patients potentially on sub-optimal supplement strengths or who have no clinical indication for continuing treatment.

Reason for Review

To ensure that the Calcium and Vitamin D3 supplements prescribed provide the recommended doses for maximal fracture protection to the right patients. To promote the D&G Formulary choices as above which provide the recommended doses at the most competitive price and to ensure that all prescribing is rationale and evidence based.

The SIGN guidelines for Osteoporosis\(^1\) recommend Calcium +/- Vitamin D3 supplements in postmenopausal women

- With multiple vertebral fractures
- With at least one vertebral fracture and osteoporosis determined by DXA
- With osteoporosis determined by DXA with or without previous nonvertebral fracture
- Who are frail, aged >80yrs, have a diagnosis of osteoporosis with/without previous osteoporotic fracture.

Supplementation is recommended for men with a diagnosis of osteoporosis with or without a previous osteoporotic fracture.

Calcium and Vitamin D supplementation is also a treatment option for patients at risk of osteoporosis secondary to longer-term steroid use\(^2\).

NHS D & G Osteoporosis Guidelines recommend calcium & vitamin D3 supplementation for the following patient groups

- All those > 70 years old with osteoporosis as additional supplement to treatment
- Those > 70 years old with osteoporosis and inadequate diet or confirmed deficiency
- Ambulatory frail elderly in residential or nursing care with additional risk factors for treatment and prevention
  (1 tablet may be acceptable in younger individuals whose diet is inadequate)

SIGN Guideline 142 recommends dietary sources for calcium.

Calcium intake from diet can be assessed (see Appendix 4)

In Scotland, dietary vitamin D intakes are insufficient to meet the needs of people with inadequate sunlight exposure. Supplementation with 10 micrograms/day of vitamin D (400 IU) should be considered to avoid deficiency.

2 Inclusion Criteria

⇒ All patients on non-formulary calcium & vitamin D3 supplementation
3 Exclusion Criteria

Patients with a history of, or a recent biochemistry result of, hypercalcaemia / hypercalciuria should be flagged up to the GP(s).

Patients with hyperparathyroidism, parathyroidectomy and/or moderate to severe renal failure will be flagged up to the GP(s).

Pregnant or breastfeeding women will be flagged to the GP(s).

4 Preparation and planning

Implementation of the audit in selected GP practices by the Prescribing Support Team is as follows:

A computer search to identify patients currently receiving repeat prescriptions for Calcium and Vitamin D3 supplements.

The auditor will record on the data collection form, the following information regarding each patient identified by the search:

- the indication for Calcium and Vitamin D
- whether this info is read coded
- the dosage, frequency and strength of tablets issued
- the apparent compliance
- any interacting drugs and any action required
- whether the indication has been linked to the medication
- whether the Formulary choice has been used before
- any apparent contraindications to treatment (including hyperparathyroidism, hypercalcaemia and chronic kidney disease).

Where information is not available in the patient’s electronic records, the notes will be checked by the Prescribing Support Technician and missing information recorded on the data collection form. This information will be verified by the GP and added to the electronic notes by administrative staff where appropriate.

The Prescribing Support Technician will then identify where the patient can be switched to a more cost effective formulation that has equal or more, Calcium and Vitamin D3 content.

Patients who have been prescribed Calcium and Ergocalciferol (low calcium content) will be flagged up to the GP to ascertain whether it is appropriate for these patients to be changed to an alternative product containing 1200mg Calcium.

Patients who are prescribed calcium as a phosphate-binder should not normally be prescribed a compound with Vitamin D in it too. Any such patients will be brought to the attention of the GP for review.

Non-compliant patients will be brought to the attention of the GP. The GP will be asked to consider removal of the supplement from the patient’s repeat list if there is no clinical indication.

The prescriber will be informed of any drug interactions if these are felt to be of significance and if they can not be managed by instructions as to the timing of other medications.

A note will be made in the patient’s computer record detailing the action taken and letters will be sent out to explain the change.

The local community pharmacy/pharmacies will be informed about the activity.
LIMITATIONS
This audit is NOT aimed at identifying patients for whom a supplement may be appropriate e.g. those receiving oral corticosteroids (for longer than 3 months and above 7.5mg of prednisolone daily or equivalent but who are not currently prescribed calcium and vitamin D3).
It will not identify any patients who are currently prescribed a calcium supplement which does not also contain Vitamin D so will not determine if these patients should be receiving both. These issues can be addressed in a future audit.

5 Action
Letters written to all patients outlining the reasons for changes to their medication to ensure they are fully informed and given an opportunity to discuss this with either their GP or practice pharmacist.
Admin. staff in practices and community pharmacies to be made aware of discontinuation(s) of repeat medication.

REFERENCE
SIGN GUIDELINE 142: http://sign.ac.uk/guidelines/fulltext/142/
Management of osteoporosis and the prevention of fragility fractures
**Drug Interactions**

Ciprofloxacin and tetracycline* – Calcium will reduce the antibiotic’s absorption (change dosing times) * take three hours apart

Bisphosphonates – Calcium will reduce the absorption of the bisphosphonate (the patient should have received counselling to take the bisphosphonate at least 30 mins before other tablets or food and 2 hours before calcium)

Digoxin/cardiac glycosides – hypercalcaemia should be avoided to reduce the risk of arrhythmia (check adjusted Calcium level where available in patient’s record)

Sodium fluoride – take two hours apart

Steroids may reduce the absorption of calcium salts (no action)

Thiazide Diuretics – increased risk of hypercalcaemia (check adjusted calcium level in patient records).

Iron – Calcium may reduce the absorption of iron (change dosing times/instructions).

Thyroxine – calcium may reduce the absorption of levothyroxine (change dosing times/instructions).

Zinc – Calcium salts reduce the absorption of zinc (change dosing times/instructions).
Dear patient

As part of a review of prescribing, NHS Dumfries & Galloway are considering some changes to the drugs prescribed regularly for thinning of the bones (osteoporosis). The next time you request your calcium and vitamin D3 supplement, you will notice we have changed your prescription to

This is only a change of brand name and you will still be getting the same drug in the correct strength as advised by national guidance. The change will help doctors to continue using high quality treatments while making the most effective use of available resources.

We propose to introduce the change with your next prescription. Please finish your current calcium and vitamin D tablets as normal and then start the new tablets as directed.

If you should have any queries, please contact the Surgery.

Yours sincerely,
Patient information about Calcium and Vitamin D3 supplements for osteoporosis prevention

You have been prescribed a calcium and vitamin D3 supplement by your GP to prevent thinning of the bones and to reduce the likelihood of fractures in the future. It is important that you take these tablets daily as prescribed. Wash them down with a glass of water. You may want to brush your teeth to get rid of the chalky after taste.

The foods we eat contain a variety of vitamins, minerals and other important nutrients that help keep our bodies healthy. Two nutrients in particular — calcium and vitamin D — are needed for strong bones.

**The Role of Calcium**

Calcium is needed for our heart, muscles and nerves to function properly and for blood to clot. Inadequate calcium significantly contributes to the development of osteoporosis. Many published studies show that low calcium intake throughout life is associated with low bone mass and high fracture rates. National nutrition surveys have shown that many women and young girls consume less than half the amount of calcium recommended to grow and maintain healthy bones.

**The Role of Vitamin D**

Vitamin D is needed for the body to absorb calcium. Without enough vitamin D, we cannot form enough of the hormone calcitriol (known as the “active vitamin D”), causing insufficient calcium absorption from the diet. In this situation, the body must take its calcium from its stores in the skeleton, which weakens existing bone and prevents the formation of strong, new bone.

You can get vitamin D safely in two ways: through the skin and from the diet. However if you have or are at risk of osteoporosis evidence shows that in addition to an adequate diet, supplements do prevent bone thinning.

Vitamin D is formed naturally in the body after exposure to sunlight. Fifteen minutes in the sun is plenty of time to manufacture and store all of the vitamin D you need. Experts recommend a daily intake of between 400 and 800 International Units (IU) of vitamin D, which also can be obtained from supplements or vitamin D-rich foods such as egg yolks, saltwater fish and liver. Do not take more than 800 IU per day unless prescribed by your doctor since massive doses up to and over 5,000 IU of vitamin D may be harmful.

Remember, a calcium-rich diet is only one part of an osteoporosis prevention or treatment programme. Like exercise, getting enough calcium is a strategy that helps strengthen bones at any age. But these approaches may not be enough to stop bone loss caused by lifestyle, medications or menopause which is the reason you have been prescribed a calcium & vitamin D3 supplement.
To assess your average daily calcium intake enter the number of times in a week that you eat the food listed below, multiply that number by the values given and enter that in the column total. Add up the totals in the last column and then divide by seven to get your average daily calcium intake.

Example: for cups of tea with milk if you have tea 21 times in a week:

Cups of tea with milk  21 X 40mg = 840mg

<table>
<thead>
<tr>
<th>Food</th>
<th>Total per week</th>
<th>Multiplied by</th>
<th>Total mg calcium</th>
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</thead>
<tbody>
<tr>
<td>Cups of tea with milk</td>
<td></td>
<td>40mg</td>
<td></td>
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<tr>
<td>Cups of coffee with milk</td>
<td></td>
<td>50mg</td>
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<tr>
<td>Milky drinks</td>
<td></td>
<td>250mg</td>
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<tr>
<td>Milk with cereal</td>
<td></td>
<td>155mg</td>
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<tr>
<td>Slices of white or brown bread</td>
<td></td>
<td>30mg</td>
<td></td>
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<tr>
<td>Slices of wholemeal bread</td>
<td></td>
<td>15mg</td>
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<tr>
<td>Portions of cheese</td>
<td></td>
<td>320mg</td>
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<tr>
<td>Portions of cottage cheese</td>
<td></td>
<td>50mg</td>
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<td>Biscuits</td>
<td></td>
<td>30mg</td>
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<tr>
<td>Portions of cake</td>
<td></td>
<td>50mg</td>
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<tr>
<td>Portions of milk pudding (custard, ice cream, yoghurt etc)</td>
<td></td>
<td>100mg</td>
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<td>Portions of green vegetables</td>
<td></td>
<td>40mg</td>
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<tr>
<td>Portions of sardines or pilchards</td>
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<td>350mg</td>
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<td>Portions of fish</td>
<td></td>
<td>50mg</td>
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<td>Porridge</td>
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<td>37mg</td>
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<td>Muesli</td>
<td></td>
<td>100mg</td>
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<td>Pancakes or crumpets</td>
<td></td>
<td>80mg</td>
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<tr>
<td>Oranges</td>
<td></td>
<td>75mg</td>
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<tr>
<td>Eggs (X2 for scrambled or omelette)</td>
<td></td>
<td>37mg</td>
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<tr>
<td>Cheese omelette</td>
<td></td>
<td>477mg</td>
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<tr>
<td>Cheese sauce</td>
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<td>190mg</td>
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<tr>
<td>Quiche</td>
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<td>200mg</td>
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<tr>
<td>Lasagne, moussaka or similar</td>
<td></td>
<td>225mg</td>
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<td><strong>TOTAL per week</strong></td>
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<td>Divide by 7</td>
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<tr>
<td>for daily intake</td>
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Ideal daily calcium intake for adults is 700mg.