



CLINICAL GUIDELINE

Vitamin D Prevention and Treatment of Deficiency in Adults

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Does this version include changes to clinical advice:	No
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Lead Author:	Maurizio Panarelli
Approval Group:	Medicines Utilisation Subcommittee of ADTC

Important Note:

The Intranet version of this document is the only version that is maintained. Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

SCOPE:

This guidance gives advice on how to treat adults who are at risk of or who are known to have deficient /insufficient levels of vitamin D.

This guidance is written for primary and secondary care prescribers. It refers to adults only.

Note – The use of vitamin D in patients with Primary Hyperparathyroidism should be determined through specialist referral to Endocrinology.

Potent vitamin D analogues such as calcitriol or alfacalcidol are typically reserved for patients with renal osteodystrophy or for patients with Primary Hypoparathyroidism and should be used in the context of guidance from appropriate specialists as they carry risk of hypercalcaemia / hypercalciuria.

BACKGROUND:

The Scottish Government released updated guidance (available [here](#)) in July 2020 including revised guidance to reflect the coronavirus (COVID-19) situation. NICE guidance can be accessed [here](#).

In brief, the current recommendations **for adults** (living in Scotland) are:

- All pregnant and breastfeeding women should take a daily supplement containing 10 micrograms (400 units) of vitamin D, to ensure the mother's requirements for vitamin D are met and to build adequate fetal stores for early infancy.
- The Scientific Advisory Committee on Nutrition (SACN) also recommends people who are not exposed to much sunlight, such as frail or housebound individuals, or those that cover their skin for cultural reasons; and people from minority ethnic groups with dark skin such as those of African, African-Caribbean and South Asian origin, (because they require more sun exposure to make as much vitamin D) should also consider a daily supplement all year round.
- The Scottish Government recommends that everyone aged 5 and above should consider taking a daily supplement of 10 micrograms (400 units) of vitamin D particularly during the winter months (October to March).

Most of the population of the West of Scotland has low levels of vitamin D because of low levels of UV/sun exposure. The important clinical syndrome that can result from deficiency of vitamin D is osteomalacia – a syndrome characterised by malaise, multifocal bone pain with tenderness and proximal myopathy. Osteomalacia is associated with abnormal biochemistry – high serum alkaline phosphatase, serum calcium low/low normal, serum PTH high & low vitamin D, usually <25nmol/L. The prime aim in giving vitamin D to our patients is to prevent this vitamin D deficiency syndrome. Diverse health problems ranging from MS to heart disease, from TB to cancers at various sites have been ASSOCIATED with low levels of vitamin D (and with higher latitude) BUT there is NO or INSUFFICIENT evidence to support a causal link between low vitamin D and any of these problems; furthermore there is no evidence that giving vitamin D alters the incidence of any of these conditions. A [NICE Rapid guideline COVID-19: vitamin D](#) concluded that there was insufficient evidence to recommend using vitamin D to prevent or treat Covid-19.

Vitamin D levels of $<25\text{nmol/L}$ are generally considered to be 'deficient' (however even at this level most patients do not have osteomalacia). Vitamin D levels of above 50nmol/L are generally viewed as 'sufficient'. In terms of description; vitamin D levels in the range of $25\text{-}50\text{nmol/l}$ are described as insufficient however use of vitamin D supplements are often not required in this context - see Royal Osteoporosis Society (NOS) - Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management [here](#). The vitamin D status is assessed by measuring 25-hydroxyvitamin D ($25(\text{OH})\text{D}$).

This compound is inactive, but is stable, and serum levels correlate reasonably well with vitamin D activity. This is the vitamin that is measured when "vitamin D" measurement is requested through biochemistry.

1,25-dihydroxyvitamin D ($1,25(\text{OH})_2\text{D}_3$) is the biologically active form of vitamin D. This can be measured biochemically but it is unstable and levels do not correlate well with vitamin D activity. Measurement of $1,25(\text{OH})_2\text{D}_3$ should be reserved for patients with hypercalcaemia complicating granulomatous disease such as sarcoidosis or in patients with vitamin D resistant rickets. There may rarely be cause to measure $1,25(\text{OH})_2\text{D}_3$ in patients taking calcitriol or alfacalcidol.

WHEN TO MEASURE VITAMIN D:

1. Patients with low adjusted serum calcium (<2.1mmol/L) and/or where other blood results suggest possible osteomalacia (e.g. low serum phosphate or raised alkaline phosphatase). Osteomalacia is clinically characterised by joint and bone pain.
2. Patients with malabsorption syndromes
3. CKD (eGFR <30) - measurement in this context should usually be carried out by specialist clinics only.

WHEN NOT TO MEASURE VITAMIN D:

1. Patients prescribed Vitamin D at daily doses of less than 5000 units/day. Toxicity is unlikely at these doses and where required should be undertaken by secondary care specialists.
2. Patients on alfacalcidol or calcitriol (not measured by assay – see 1,25(OH)2D3 above)
3. Vitamin D is not helpful in investigation of tiredness, chronic fatigue / fibromyalgia or non-specific aches and pains (with normal bone biochemistry).

HOW FREQUENTLY TO MEASURE VITAMIN D:

Follow-up measurements are generally not required but there are occasional exceptions, for example in patients with malabsorption with suboptimal vitamin D. But repeat testing is only appropriate after at least 6 months' supplementation and is only available at specialists' request. Performance management will not permit repeat measurements from primary care within 12 months.

PRESCRIBING VITAMIN D:

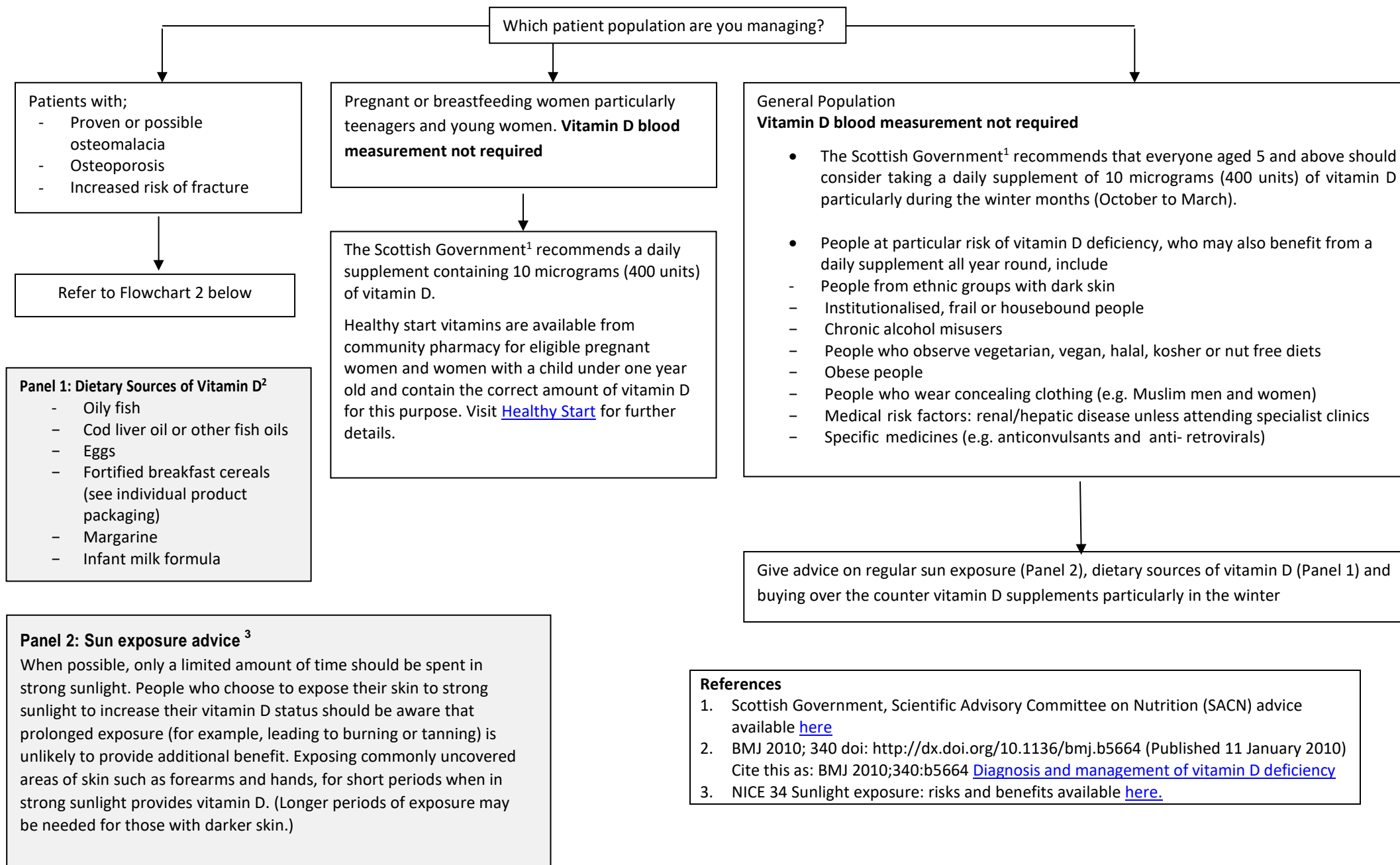
See the following flowcharts for advice on when supplementation of vitamin D is indicated and what to prescribe;

Note: If prescribing vitamin D in a patient with a calcium level at the upper end of the normal range it is best practice to re-check calcium levels after 6-8 weeks.

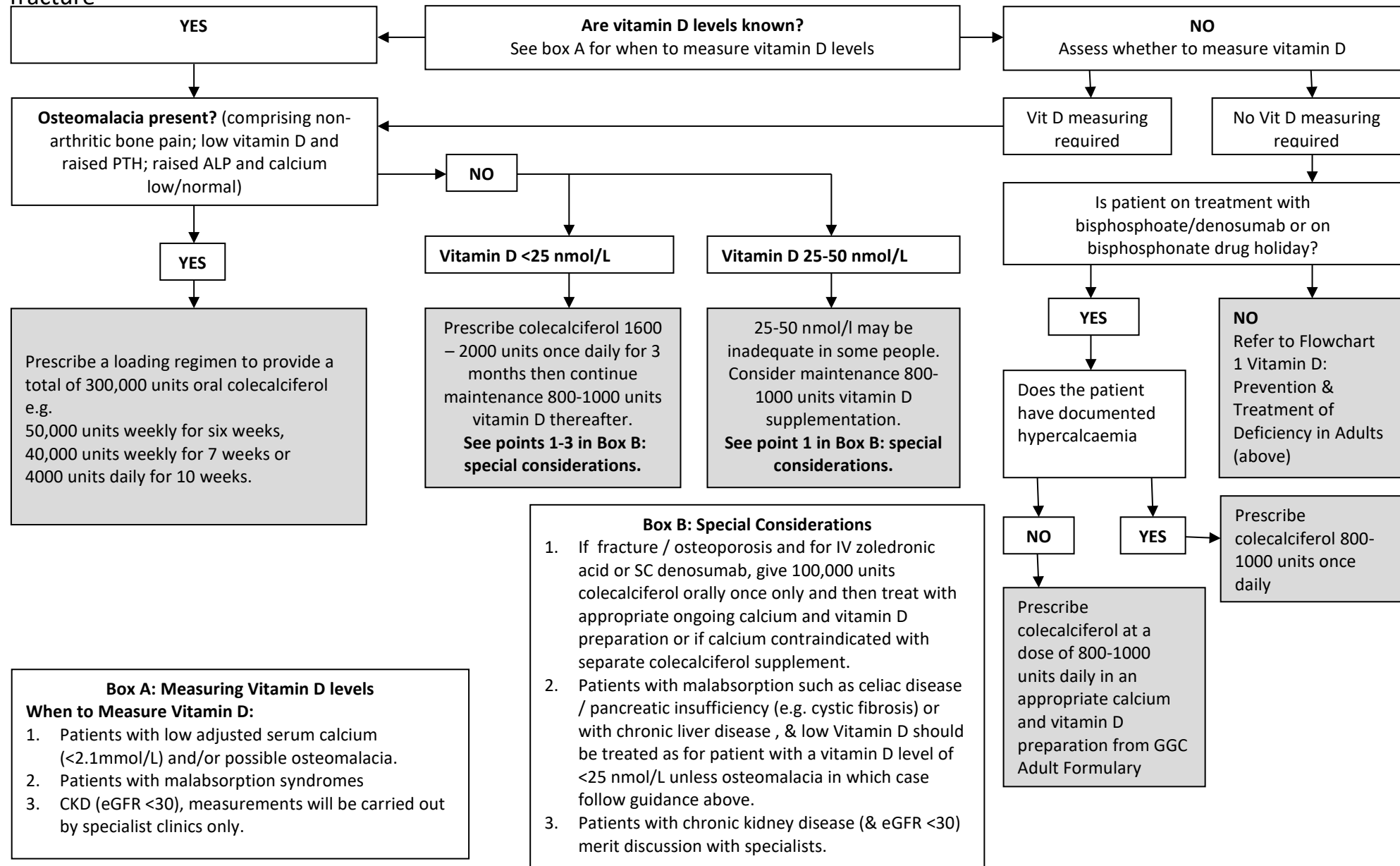
Flowchart 1 – Vitamin D: Prevention & Treatment of Deficiency in Adults

Flowchart 2 - Vitamin D: Deficiency in Adults in the context of (or at increased risk of) osteomalacia, osteoporosis or increased risk of fracture.

Flowchart 1 –Vitamin D: Prevention & Treatment of Deficiency in Adults



Flowchart 2-Vitamin D: Deficiency in Adults in the context of (or at increased risk of) osteomalacia, osteoporosis or increased risk of fracture



Notes – The use of vitamin D in patients with Primary Hyperparathyroidism should be determined through specialist referral to Endocrinology. Potent vitamin D analogues such as calcitriol or alfacalcidol are typically reserved for patients with renal osteodystrophy or for patients with Primary Hypoparathyroidism and should be used in the context of guidance from appropriate specialists – as they carry risk of hypercalcaemia / hypercalciuria.