VITAMIN D INSUFFICIENCY

Vitamin D insufficiency is now recognised as a major health issue.

Severe vitamin D deficiency will result in Osteomalacia. Low vitamin D levels are also associated with Osteoporosis, increased fracture risk and falls.

Additionally, a wide range of diseases have been associated with low levels of circulating serum vitamin D, including autoimmune diseases, cardiovascular and metabolic diseases, some cancers, microbial and respiratory diseases and some neurological and mental health conditions. Most of the current evidence is observational but randomised controlled trials are underway and it is hoped these will provide the evidence base for these associations.

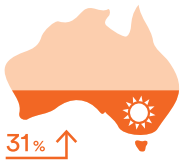
SOURCES OF VITAMIN D

Under normal circumstances most of our vitamin D requirements are met from daily exposure to sunshine.

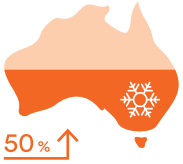
THE PREVALENCE OF VITAMIN D DEFICIENCY VARIES

For many people this is no longer achievable. The groups at greatest risk include housebound, communitydwelling older and/or disabled people, those in residential care, dark-skinned people (particularly those who wear covering clothing for religious or cultural reasons) and people who regularly avoid sun exposure or work predominantly indoors.

HOW COMMON IS VITAMIN D DEFICIENCY?



ADULTS IN AUSTRALIA WITH INADEQUATE VITAMIN D STATUS (SERUM LEVEL <50 NMOL/L)



MORE THAN 50% TOWARDS THE END OF THE WINTER PERIOD

In Australia it's estimated 31% of adults have inadequate vitamin D increasing to 50% by the end of winter. People residing in southern states also have an increased incidence of low circulating serum vitamin D levels.
Of the patients with Vitamin D insufficiency, 5% are deficient with results of <20 nmol/L.

WHAT IS THE TARGET VITAMIN D LEVEL?

Based on a review of current literature and recently published recommendations,1,2 we suggest that adequate vitamin D status is a serum level equal to, or greater than, 50 nmol/L at the end of winter. (This level should be 10-20 nmol/L higher at the end of summer to allow for seasonal decrease).

This figure is based on the level below which parathyroid hormone concentrations begin to rise and the risk of fractures increases. An international consensus statement recently agreed on a range between 50 and 60 nmol/l to prevent adverse musculoskeletal outcomes, including falls and fractures.

ADEQUATE VITAMIN D STATUS AT THE END OF WINTER 50 NMOL/L

The target level for prevention of other diseases is not clear but may be higher, in the range of 75-80nmol/L, however more evidence is required to support this higher level. As for all tests, Australian Clinical Labs' pathologists and scientists will continue to evaluate current literature and our target range may change as evidence emerges.

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SUPPLEMENTATION

Severe vitamin D deficiency (serum level <20 nmol/L) may require 3000-5000 IU/ day for 6-12 weeks. Levels should be checked after 3 months.

A maintenance dose of up to 1000 IU/day may be adequate, however some individuals will require higher doses. Periodic follow up testing should be considered if risk factors change and to check for therapeutic compliance and to exclude malabsorption or excessive intake.

SEVERE VITAMIN D DEFICIENCY MAY REQUIRE 3000-5000 IU/ DAY FOR 6-12 WEEKS

Supplements should be vitamin D3 (Cholecalciferol) as this is more effective than vitamin D2 (Vitamin D2 supplements are not routinely available in Aust). It is important to note that optimal health outcomes are achieved in the setting of adequate dietary calcium; this should be at least 1g/day and up to 1.3g/day in the older adult. Many will require supplementation to achieve this amount.

Note: Calcium supplements are best taken before sleep to ensure maximum absorption and suppression of peak bone turnover which usually occurs between approximately 2:00 and 3:00am.

BENEFITS OF THE TEST

Assess the vitamin D status to ascertain which patients would benefit from vitamin D supplementation and thus reduce the risk of falls, fractures and other sequelae of low serum vitamin D levels.

RECOMMENDATIONS FOR TESTING

- Signs, symptoms and/or planned treatment of osteoporosis or osteomalacia.
- Increased alkaline phosphatase with otherwise normal LFTs.
- Hyperparathyroidism, hypo- or hypercalcaemia or hypophosphataemia.
- Malabsorption (e.g.CF, IBD, Coeliac etc).
- Dark skin, or chronic/severe lack of sun exposure for cultural, religious, medical, occupational or residential reasons.
- Medications known to decrease vitamin D levels (e.g.anticonvulsants).
- CRF and transplant recipients.

FURTHER TESTING

A serum Calcium assessment and Parathyroid Hormone (PTH) will assist in placing the vitamin D level within the context of overall calcium homeostasis.

If Osteoporosis is present, fasting blood crosslaps (CTX) will provide a way of monitoring bone turnover and response to therapy.

An individual's response to Vitamin D supplementation can vary and should be checked after 2-3 months of therapy.

SPECIMEN REQUIREMENTS

Sample Type:	Collection Tube Type:	Testing Frequency:
Serum	Gold SSTII Tube	Daily

Australian Clinical Labs' laboratories utilise fully automated, state of the art equipment to deliver accurate and reliable, same day results.

The Siemens assay used by our labs for measuring vitamin D is traceable to the NIST-Ghent University developed reference measurement procedure (RMP) based on isotope-dilution liquid chromatography-tandem mass spectrometry (ID-LC/MS/MS)3,4.

REFERENCES

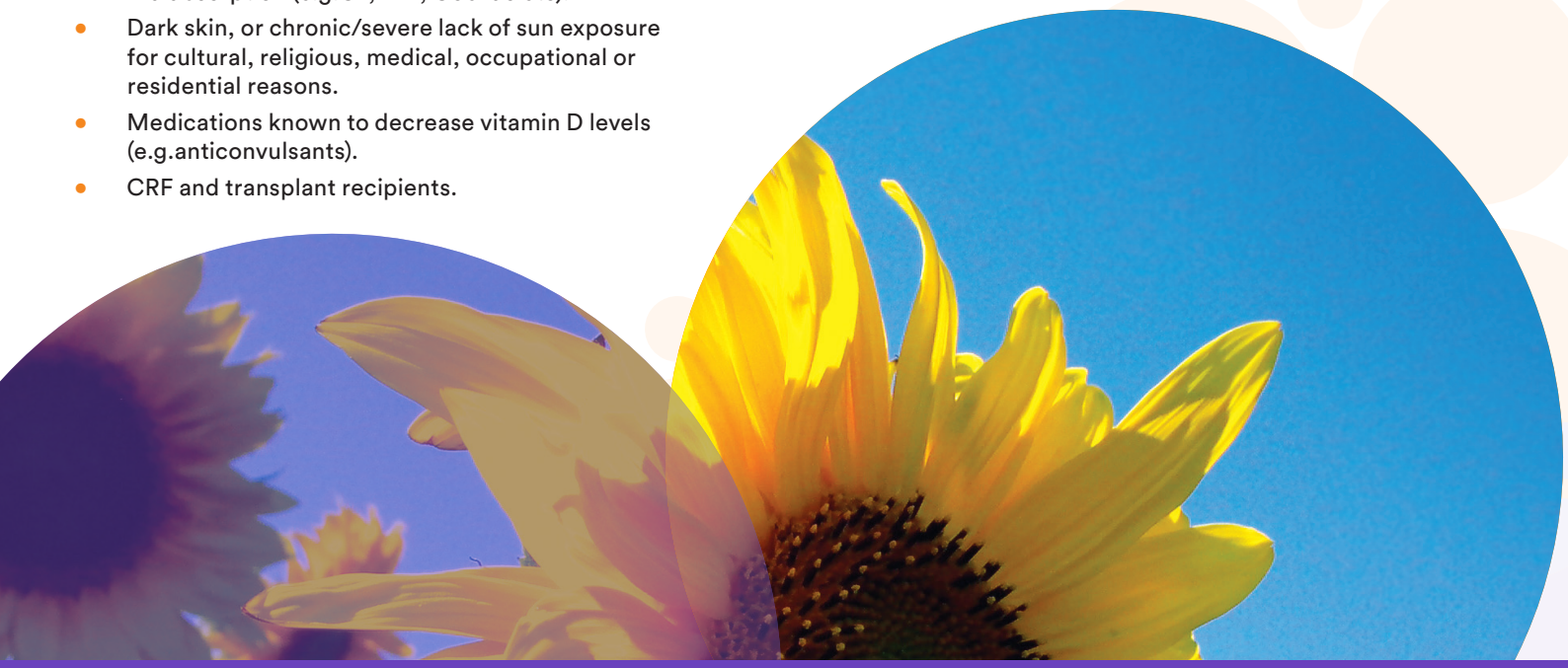
All Australian Clinical Labs laboratories are enrolled in Australian Quality Assurance programs, further underpinning our commitment to accuracy and quality.

1. Vitamin D and health in adults in Australia and New Zealand: a position statement. MJA 196(11), 18 June 2012.

2. RCPA Position Statement: Use and Interpretation of Vitamin D testing. The Royal College of Pathologists of Australasia, May 2013.

3. Thienpont L, Stepman HCM, Vesper HW. Standardisation of measurements of 25-Hydroxyvitamin D3 and D2. Scandinavian Journal of Clinical & Laboratory Investigation, 2012; 72 (Suppl 243): 41-49.

4. Sempos CT, Vesper HW, Phinney KW, Thienpont LM, Coates PM. Vitamin D Standardisation Program (VDSP). Vitamin D status as an international issue: National surveys and the problem of standardisation. Scandinavian Journal of Clinical & Laboratory Investigation, 2012; 72 (Suppl 243): 32-40.



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