

References

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A PDF copy of this can be downloaded from our website:

www.cityassays.org.uk



Black Country Pathology Services



Serum 25-Hydroxyvitamin D₂ & D₃ Information for Users



NHS Pathology Serving the Black Country

Provided by Sandwell and West Birmingham NHS Trust, The Dudley Group NHS Foundation Trust, The Royal Wolverhampton NHS Trust and Walsall Healthcare NHS Trust.

A Teaching Trust of The University of Birmingham
Incorporating City, Sandwell and Rowley Regis Hospitals

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Sending Specimens for Analysis

Sample requirement: minimum of 0.35mL of serum or plasma. Please contact the laboratory if you would like to send a smaller volume of sample.

- Samples should be stored at 4°C prior to dispatch. There is no need to protect samples from light e.g. wrap in foil
- Send samples by first class post at ambient temperature to the address on the back of this leaflet

Reference Ranges

Total 25-Hydroxyvitamin D	(nmol/L)
Severe Deficiency	<15
Deficiency	15 - 30
Insufficiency	30.1-50
Adequate Status	50.1-220
High	>220

NB to convert µg/L to nmol/L multiply by 2.5

We also report the individual values for 25-hydroxyvitamin D₂ & D₃ in nmol/L for clinicians to monitor supplementation.

Analytical Method

Our assay uses a liquid-liquid extraction method and tandem mass spectrometry to measure 25-hydroxyvitamin D₂ and D₃. Deuterated internal standards are employed for both 25-hydroxyvitamin D₂ and D₃. Only 150uL of serum/plasma is required, however please contact the laboratory if you have very low volume samples that you would like to measure.

The limit of quantification for the assay (CV less than 15%), is 5.0 nmol/L for both D₃ and D₂.

Clinical Use

There is increasing evidence to show vitamin D deficiency is widespread in the UK. In a local study we found for our multi-ethnic inner city population (Birmingham) the prevalence of vitamin D deficiency, defined as a 25-hydroxyvitamin D concentration <25 nmol/L, was high at 24%, with 1 in 8 Caucasians, 1 in 4 Black Afro-Caribbean's and 1 in 3 Asians found to be deficient. Levels of deficiency were much higher in Asian women with almost 1 in 2 individuals (43%) found to have a vitamin D level below 25nmol/L.

Vitamin supplementation of food and tablets comes in the form of both

vitamin D₂ and Vitamin D₃. Recent evidence has now shown that vitamin D₂ potency is less than one third that of vitamin D₃, and its duration of action is much lower.

This is most likely due to a difference in affinity for vitamin-D binding globulin, with D₂ having a lower affinity, and subsequently a shorter circulating half-life. As a consequence, patients treated with D₂ may respond slower than expected to treatment. Therefore it is clinically important especially for monitoring patients treated for vitamin D deficiency (rather than just screening) both 25-hydroxyvitamin D₂ and D₃ are measured. It also allows clinicians to check patient compliance.

