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The effects of seasonal variation of 25-hydroxyvitamin D and fat mass on a diagnosis of vitamin D sufficiency^{1,2,3}

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Background: The effect of season on vitamin D status is often overlooked in studies of optimal vitamin D concentrations and in clinical practice.

Objectives: We aimed to determine the effects of seasonal variation of 25-hydroxyvitamin D [25(OH)D] on a previously selected minimum concentration for vitamin D sufficiency (50 nmol/L) and to determine whether fat mass modifies these effects.

Design: A cross-sectional study evaluated 1606 healthy postmenopausal women and 378 older men from Auckland, New Zealand, who were undergoing single measurements of 25(OH)D.

Results: Concentrations of <50 nmol 25(OH)D/L were seen in 49% (range: 23%-74%) of women and 9% (range: 0%-26%) of men when measured, but 73% of women and 39% of men were predicted to have trough 25(OH)D concentrations < 50 nmol/L, according to the demonstrated seasonal variation. The predicted duration of 25(OH)D concentrations < 50 nmol/L was 250 d/y in women and 165 d/y in men.

Conclusion: Seasonal variation significantly affects the diagnosis of vitamin D sufficiency, which requires seasonally adjusted thresholds individualized for different locations. Clinicians should consider the month of sampling and the amount of body fat when interpreting 25(OH)D measurements.

Key Words: Vitamin D • vitamin D deficiency • insufficiency • seasonal variation • fat mass

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