

# Changes in Vitamin D Administration Since Implementation of the 1-84 PTH/7-84 PTH Ratio

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It has been demonstrated that the intact PTH assay value is the sum of two strong agonists with opposite biological activities, 1-84 PTH and 7-84 PTH. An intact PTH assay value from a dialysis patient may be made up of 10%-90% 1-84 PTH. Therefore, using only the intact PTH assay value it is difficult to diagnose and monitor bone status during vitamin D therapy. Using only the 1-84 PTH for diagnostics and monitoring would disregard the important effects of large C terminal PTH fragment(s) (likely 7-84 PTH). It has been demonstrated that the ratio of 1-84 PTH/7-84 PTH has been more effective than intact PTH for predicting bone turnover. In our dialysis facility we use calcitriol (Calcijex), paricalcitol (Zemlar) and doxercalciferol (Hectorol). In the past we used only intact PTH with a <100 pgm/mL criteria for prediction of adynamic low bone turnover (prediction 1). We then modified our criteria for predicting adynamic low bone turnover to be either <100 pgm/mL intact PTH or <1.4 ratio (prediction 2). We compared the vitamin D usage for 109 patients during a 4 month period<sup>1</sup> using a prediction 1 and a 4 month period<sup>2</sup> using a prediction 2. During these times, no patients crossed over from one form to another form of vitamin D. At the end of period<sup>1</sup>, 31 patients were receiving Zemlar at an average dose of 2.2 micrograms. At the end of period<sup>2</sup>, 31 patients were receiving Zemlar at an average dose of 2.59 micrograms. At the end of period<sup>1</sup>, 22 patients were receiving Calcijex at an average dose of 0.56 micrograms. At the end of period<sup>2</sup>, 12 patients were receiving Calcijex at an average dose of 0.33 micrograms. At the end of period<sup>1</sup>, 56 patients were receiving Hectorol at an average dose of 3.3 micrograms. At the end of period<sup>2</sup>, 47 patients were receiving Hectorol at an average dose of 2.29 micrograms. It is important to diagnose low bone turnover during a vitamin D treatment regimen in order to avoid over suppression. The gold standard for diagnosing bone turnover is bone biopsy, but absent this procedure for routine patient care inclusion of the 1-84 PTH/7-84 PTH ratio is a useful clinical aid. That the use of Zemlar increased in comparison to the other vitamin D sterols might suggest that Zemlar does not stimulate the production of 7-84 PTH (lower 7-84 PTH values raise the ratio) as compared to other vitamin D sterols.

Dr. Hassan Fehmi, Yunchoon Long, R.D., et al. "Changes in Vitamin D Administration Since Implementation of the 1-84 PTH/7-84 PTH Ratio".  
*J Amer Soc Nephrol* 2003(Nov); 14:641.