

# Method to Measure Non-Typical 1-84 PTH

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A rare form of PTH, non typical 1-84 PTH (nt1-84 PTH) was found in a pt with parathyroid cancer. nt1-84 PTH is chromatographically distinct by HPLC from 7-84 PTH and 1-84 PTH. nt1-84 PTH is not detected in the iPTH or total PTH assay (tPTH), whereas 1-84 PTH is detected in the tPTH assay. However, nt1-84 PTH is detected in the CAP (specific 1-84 PTH assay). The only difference between the tPTH and CAP assays is the binding specificity of the label antibody which, in the CAP assay, requires the 1st amino acid for binding, and in the tPTH assay, can bind anywhere along the 7-34 PTH region. This leads to the conclusion that nt1-84 PTH has all 84 amino acids present and possibly has a change in folding so that a region of amino acids (epitope) is concealed (enveloped). We described elsewhere the method for the direct measurement of 7-84 PTH. Briefly, 250 ul of specimen is pretreated with a room temperature 5-8 hr incubation in a tube whose walls are coated with a PTH antibody specific for 1-84 PTH, but will not bind to 7-84 PTH. Once all of the 1-84 PTH has been removed (bound to the tube wall) 200 microliters are removed and assayed for 7-84 PTH in an assay that would have also measured 1-84 PTH if the specimen had not first had all 1-84 PTH extracted. The detection differences between the tPTH and CAP assays along with the method for the direct measurement of 7-84 PTH enable an indirect measurement of nt1-84 PTH according to the following formula:

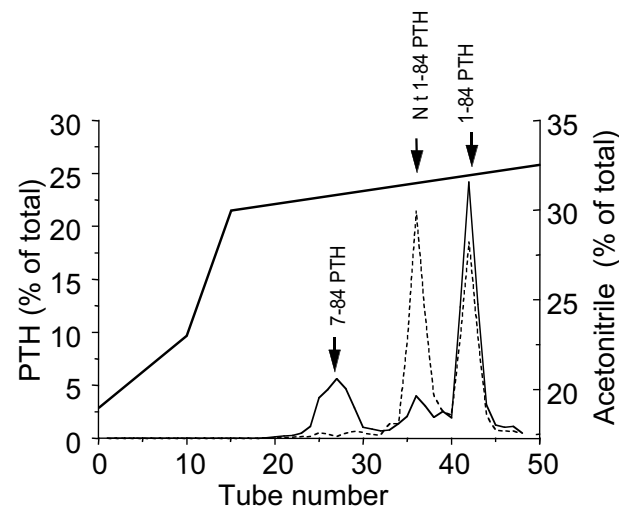
$$\text{tPTH assay} = 1\text{-}84 \text{ PTH} + 7\text{-}84 \text{ PTH}$$

$$\text{direct 7-84 PTH assay} = 7\text{-}84 \text{ PTH}$$

$$\text{CAP} = 1\text{-}84 \text{ PTH} + \text{nt}1\text{-}84 \text{ PTH}$$

$$\text{nt}1\text{-}84 \text{ PTH} = \text{CAP} - \text{tPTH} - (\text{direct 7-84 PTH})$$

Today, much is not known about nt1-84 PTH such as its etiology, bioactivity, regulation, and relevance for disease diagnosis/monitoring, but with this new method for its detection without the need of HPLC, these areas of research may be pursued easily.



Sample loaded: 9 ml on Agilent HPLC. CAP (---) = whole PTH = 1-84 PTH assay value = 1374 pg/ml. Total PTH (—) = 1-84 PTH + 7-84 PTH assay value = 1541 pg/ml.

Cantor T. Method to Measure Non-Typical 1-84 PTH. *J Am Soc Nephrol* 2004; 15(10): PUB045, p. 771A.