

## Pattern of Calcium and Parathyroid Hormone Normalization at 12-Months Follow-Up After Parathyroid Operation: Reply

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We appreciate the supportive comments from Dr. Rosario. It is reassuring that our medical colleagues, also, are increasingly aware of the expanded criteria for diagnosing patients with primary hyperparathyroidism. The classic definition of having an absolute elevation in both calcium and parathyroid hormone levels will overlook many patients who may benefit from ongoing monitoring or surgical intervention. The intention of our paper is to provide some quantitative guidance in determining when the PTH level is inappropriately elevated in relation to the serum calcium, in our opinion, a more appropriate definition of primary hyperthyroidism.

Dr. Rosario's study of finding parathyroid adenomas in thyroidectomy patients with "normal" preoperative calcium (Ca) and parathyroid hormone (PTH) values brings up another important clinical principle. The "normal" range (more correctly, the "reference range") for a laboratory test simply defines where the vast majority of the population falls and ignores that an individual may have an optimal set point within that range. My analogy is that if you were to wake up 2 inches shorter, rush to your doctor in a panic because you are shrinking, you would be reassured that all is well because you are in the "normal"

range. We understand this concept of a set point for TSH levels, but recognize it less for Ca and PTH. Dr Rosario found that his patients had lower Ca and PTH values after parathyroid removal, suggesting they had returned to their physiologic set point. In our prior study of patients undergoing parathyroidectomy for normohormonal [1] hyperparathyroidism—with elevated calcium and PTH in the middle of the reference range—the PTH values on postoperative follow-up were toward the lower end of the reference range and lower than patients with classic hyperparathyroidism.

With what was once a relatively straightforward disease to diagnose, we are now moved out of our comfort zone, with the realization that a large number of patients have hyperparathyroidism with more subtle biochemical abnormalities.

### Reference

1. Wallace LB, Parikh RT, Ross LV et al (2011) The phenotype of primary hyperparathyroidism with normal parathyroid hormone levels: how low can parathyroid hormone go? *Surgery* 150: 1102–1112

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