



## THYROID FUNCTION TESTS

# Significant variations of thyroid testing in the US argue for improved standardization of practice patterns

### BACKGROUND

Thyroid problems are common and the symptoms are often very nonspecific. This is especially true with hypothyroidism. There are many different tests available to evaluate the function of the thyroid gland. However, many tests are over utilized and/or may not be appropriate for the type of thyroid problem suspected. Over the past few decades, there has been a steady increase in the number of thyroid tests ordered and the estimated cost for the most commonly ordered tests (TSH and free T<sub>4</sub>) totals \$1.6 billion per year.

The objectives of this study were to compare patterns of thyroid testing ordered between different institutions, to assess the appropriateness of such testing, and to evaluate whether laboratory utilization protocols showed improvements in thyroid testing.

### THE FULL ARTICLE TITLE

Lin DC et al and the Thyroid Benchmarking Group. Multicenter Benchmark Study Reveals Significant Variation in Thyroid Testing in the United States. *Thyroid* 2017;27:1232-45.

### SUMMARY OF THE STUDY

This study was done with data obtained from 82 laboratories associated with 24 unique US healthcare organizations, of which 13 were academic medical centers. The sites were selected from a voluntary web-based survey. The volume of serum thyroid tests over the 2015 calendar year was determined for the following tests: TSH, free T<sub>4</sub>, total T<sub>4</sub>, free T<sub>3</sub>, Total T<sub>3</sub>, T<sub>3</sub> uptake and reverse T<sub>3</sub>. Then, that volume was standardized against the frequency of complete blood count (CBC) testing, probably the most common blood test ordered. The prevalence of CBC testing was also used to determine the total testing volume of each laboratory so that

comparisons regarding overall volume across health care centers could be done. Researchers divided data by inpatient vs. outpatient patient settings. The investigators also collected data related to health care utilization management initiatives at each center.

The results showed that across the 82 laboratories, there was a higher proportion of TSH testing among outpatients than inpatients. Based on median values, sites ordered 14 Free T<sub>4</sub>, three total T<sub>4</sub>, four free T<sub>3</sub>, two total T<sub>3</sub>, 0.1 rT<sub>3</sub> and 0.1 T<sub>3</sub> uptake for every 100 TSH orders. Tests for free T<sub>4</sub> were nine times as common as those for Total T<sub>4</sub>, but free T<sub>3</sub> and Total T<sub>3</sub> were more evenly split. Comparing between sites, there were marked variations in whether an initial screening TSH was obtained and also in the order of tests ordered following an initial TSH. One of the most variable ordering behaviors for thyroid testing was whether a rT<sub>3</sub> level was obtained following an initial TSH. This happened even though there were general laboratory testing guidelines available to providers at 71% of the sites. At 38% of the sites, some tests were restricted to specialists, but only 21% of centers had guidelines for when it is appropriate to obtain thyroid testing.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that there is significant practice variation in thyroid testing and suggests a need for better guidance in test selection to improve patient care and reduce testing costs. Although the study has limitations, including the lack of clinical information that would support a particular test over another, its strength is its relatively broad sample size which makes it likely to reflect practice patterns across the entire United States.

— Jessie Block-Galarza, MD





## THYROID FUNCTION TESTS, continued

### ATA THYROID BROCHURE LINKS

Thyroid Function Tests: <https://www.thyroid.org/thyroid-function-tests/>

### ABBREVIATIONS & DEFINITIONS

**Thyroxine (T4):** the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body.

**Triiodothyronine (T3):** the active thyroid hormone, usually produced from thyroxine.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

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