



## HYPOTHYROIDISM

# Thyroid hormone use doubled in the United States from 1997 to 2016

### BACKGROUND

Thyroid hormone, usually in the form of levothyroxine, is primarily used to treat hypothyroidism. In the National Health and Nutrition Examination Survey III, which was conducted from 1988 to 1994, 4.6% of the U.S population was found to have some degree of hypothyroidism: 0.3% overt and 4.3% subclinical. However, thyroid hormone is the most frequently prescribed medication in the United States, and the proportion of adults who report taking thyroid hormone has increased in recent years.

The authors of this study sought to understand the proportion of adult individuals using thyroid hormone by age, sex, race/ethnicity from 1996 through 2016. They also aimed to study the costs associated with all thyroid hormone prescriptions during that time.

### THE FULL ARTICLE

Johansen ME, Marcinek JP, Doo Young Yun J 2020  
Thyroid hormone use in the United States, 1997–2016. *J Am Board Fam Med* 33:284–288. PMID: 32179

### SUMMARY OF THE STUDY

This study was done using data from the 1997 to 2016 Medical Expenditure Panel Survey (MEPS). This survey is funded by the Agency of Health Care Research and Quality and is representative of the population of the United States who do not reside in institutions. For this analysis, all participants in MEPS from 1997–2016 who were older than age 17 were included. They provided information regarding demographics, medical conditions and prescription information, which was then verified by pharmacies.

Thyroid hormone was described as brand (Synthroid, Levoxyl, Tirosint) or generic (Levothyroxine); also included were T<sub>4</sub> and T<sub>3</sub> formulations. The expenses were calculated including both insurance and out-of-pocket

payments. The differences in thyroid medication cost and use over time were then assessed using statistical tests.

A total of 470,067 participants were included in the study. The proportion of the U.S population reporting taking thyroid hormone increased from 4.1% in 1997 to 8.0% in 2016. Thyroid hormone use was higher in women than in men at all times. It was also higher in non-hispanic whites than in black or hispanic participants, however the rate of increase in thyroid hormone use did not differ by race/ethnicity. Use increased with increasing age, especially among individuals older than 65.

The annual expenditures associated with taking thyroid hormone increased from 1.1 billion in 1997 to 3.2 billion in 2016. The proportion of patients taking generic thyroid hormone increased from 18.1% in 2004 to 80% in 2016, and the average annual expense per individual for a generic preparation increased from \$64.60 in 2010 to \$123 in 2016.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that thyroid hormone use doubled in the United States between 1997 and 2016, and expenditures tripled during that time period. Thyroid hormone use was highest in women, older individuals and in non-hispanic whites. Importantly, the percent of individuals on thyroid hormone was ~2x greater than the frequency of hypothyroidism in the population. While there has been an increase in thyroid surgery for thyroid cancer and an increase in obesity, which has been linked to an increase in hypothyroidism, it is unlikely the main reason for the increased use of thyroid hormone. This suggests that a large number of patients are being treated with thyroid hormone for reasons other than hypothyroidism. This study reinforces the importance of appropriate thyroid hormone prescribing.

— Jessie Block-Galarza, MD



## HYPOTHYROIDISM, continued

### ATA THYROID BROCHURE LINKS

Hypothyroidism (Underactive): <https://www.thyroid.org/hypothyroidism/>

Thyroid Hormone Treatment: <https://www.thyroid.org/thyroid-hormone-treatment/>

### ABBREVIATIONS & DEFINITIONS

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

**Subclinical Hypothyroidism:** a mild form of hypothyroidism where the only abnormal hormone level is an increased TSH. There is controversy as to whether this should be treated or not.

**Overt Hypothyroidism:** clear hypothyroidism an increased TSH and a decreased T<sub>4</sub> level. All patients with overt hypothyroidism are usually treated with thyroid hormone pills.

**Thyroid hormone therapy:** patients with hypothyroidism are most often treated with Levothyroxine in order

to return their thyroid hormone levels to normal. *Replacement therapy* means the goal is a TSH in the normal range and is the usual therapy. *Suppressive therapy* means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

**Levothyroxine (T<sub>4</sub>):** the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tirosint™ and generic preparations.

**Thyroxine (T<sub>4</sub>):** 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 (T<sub>3</sub>):** the active thyroid hormone, usually produced from thyroxine.