

# Clinical Thyroidology® for the Public



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#### How does COVID-19 affect the thyroid?

COVID-19 has a high risk of death from failure of the respiratory system, but it may affect many different systems of the body. Changes in thyroid hormone levels can occur as a reaction to illness or due to a direct effect on the thyroid. In this paper, the authors aimed to get more insight into the reasons for the changes that occur in thyroid function tests during COVID-19.

Campi I et al 2021 The spectrum of thyroid function tests during hospitalization for SARS COV-2 infection. Eur J Endocrinol **184**:699–709. PMID: 33683214.

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#### Teprotumumab improves the clinical course of thyroid eye disease

Thyroid eye disease (TED) is a complex disease that can be disfiguring, and, more rarely, threaten vision. The best time to treat TED and prevent long term complications is during the acute inflammatory phase. However until recently, treatment options for TED have been limited. This study reviewed the results of 2 clinical trials of teprotumumab, representing one of the largest controlled study populations of patients with TED to date.

Kahaly GJ et al Teprotumumab for patients with active thyroid eye disease: a pooled data analysis, subgroup analyses, and off-treatment follow-up results from two randomized, double-masked, placebo-controlled, multicentre trials. Lancet Diabetes Endocrinol. 2021 Jun;9(6):360-372.

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#### Statin use associated with lower incidence of developing thyroid eye disease in patients newly-diagnosed Graves' disease

Thyroid eye disease (TED) is a complex disease that causes inflammation of the eyes, eye muscles and the surrounding tissues. The cholesterol medications known as statins are thought to potentially have anti-inflammatory effects. This study examined the association between the use of statins and other cholesterol-lowering agents on the development of TED in patients with newly diagnosed Graves' disease.

Nilsson A et al 2021 Statins decrease the risk of orbitopathy in newly diagnosed patients with Graves disease. J Clin Endocrinol Metab **106**:1325–1332

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### Is a computer program better than clinicians at adjusting levothyroxine after thyroidectomy?

After a thyroidectomy, patients must take thyroid hormone pills (levothyroxine) daily for the rest of their lives. Finding the correct dose of this medicine can be challenging. In this study, the authors examined whether using a computerized decision aid tool (DAT) to adjust the levothyroxine dose after only two weeks would be possible.

Brun VH et al. Patient tailored levothyroxine dosage with pharmacokinetic/pharmacodynamic modeling: A novel approach after total thyroidectomy. Thyroid. Epub 2021 May 12

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### Postmenopausal women whose TSH levels are kept suppressed for treatment of thyroid cancer may have lower bone density.

After thyroidectomy for thyroid cancer, patients were often placed on levothyroxine doses that were high enough to suppress TSH levels to prevent recurrence of the cancer. Long-term suppression of TSH can result in low bone density and osteoporosis. This study evaluated potential effects of TSH suppression therapy for thyroid cancer on bone density in three different groups of patients.

Ku EJ et al. 2021 Effect of TSH Suppression Therapy on Bone Mineral Density in Differentiated Thyroid Cancer: A Systematic Review and Meta-analysis. J Clin Endocrinol Metab. Epub 2021 Jul 24. PMID: 34302730

## THYROID AND PREGNANCY .....13

### Iodine supplementation in pregnant women with Hashimoto's Thyroiditis

Maintaining adequate iodine intake is essential for thyroid hormone production, which plays a vital role in the development of the baby. The ATA recommends adding to the diet a daily oral supplement that contains 150 µg of iodine during pregnancy. Iodine can variably affect thyroid function in patients with Hashimoto's thyroiditis. This study aimed to examine the effects iodine supplementation thyroid hormone levels and TPO antibodies in pregnant women with preexisting Hashimoto's thyroiditis.

van Heek L et al 2021 Avoidance of iodine deficiency/excess during pregnancy in Hashimoto's thyroiditis. Nuklearmedizin. Epub 2021 Mar 23. PMID: 33759148.

## ATA ALLIANCE FOR THYROID

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**Clinical Thyroidology for the Public**

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## Editor's Comments

Happy summer and welcome to another issue of *Clinical Thyroidology for the Public*. In this journal, we will bring to you the most up-to-date, cutting edge thyroid research. We also provide even faster updates of late-breaking thyroid news through [Twitter](#) at [@thyroidfriends](#) and on [Facebook](#). Our goal is to provide patients with the tools to be the most informed thyroid patient in the waiting room. Also check out our friends in the [Alliance for Thyroid Patient Education](#). The [Alliance](#) member groups consist of: the *American Thyroid Association*, *Bite Me Cancer*, the *Graves' Disease and Thyroid Foundation*, the *Light of Life Foundation*, *MCT8 – AHDS Foundation*, *ThyCa: Thyroid Cancer Survivors' Association*, *Thyroid Cancer Canada*, *Thyroid Cancer Alliance* and *Thyroid Federation International*.

We invite all of you to join our [Friends of the ATA](#) community. It is for you that the American Thyroid Association (ATA) is dedicated to carrying out our mission of providing reliable thyroid information and resources, clinical practice guidelines for thyroid detection and treatments, resources for connecting you with other patients affected by thyroid conditions, and cutting edge thyroid research as we search for better diagnoses and treatment outcomes for thyroid disease and thyroid cancer. We thank all of the *Friends of the ATA* who support our mission and work throughout the year to support us. We invite you to help keep the ATA mission strong by choosing to make a donation that suits you — it takes just one moment to give online at: [www.thyroid.org/donate](http://www.thyroid.org/donate) and all donations are put to good work. The ATA is a 501(c)3 nonprofit organization and your gift is tax deductible.

While the Covid-19 pandemic is winding down, it has caused an unprecedented upheaval in our daily lives and presented extremely difficult challenges to our healthcare system. We at the American Thyroid Association would like to make sure that you all have access to most accurate, reliable, fact-based and updated information. (<https://www.thyroid.org/covid-19/>)

September is [Thyroid Cancer Awareness Month](#).

**In this issue, the studies ask the following questions:**

- How does COVID-19 affect the thyroid?
- Are there new effective drugs to treat thyroid eye disease?
- Do cholesterol medications affect the risk of developing thyroid eye disease?
- Is a computer program better than clinicians in adjusting levothyroxine after thyroidectomy?
- Does TSH suppression in thyroid cancer patients affect bone density?
- Does iodine supplementation during pregnancy affect thyroid levels in pregnant women with Hashimoto's thyroiditis?

We welcome your feedback and suggestions. Let us know what you want to see in this publication. I hope you find these summaries interesting and informative.

— Alan P. Farwell, MD,



## THYROID FUNCTION TESTS

### How does COVID-19 affect the thyroid?

#### BACKGROUND

Coronavirus disease 2019 (COVID-19) is caused by SARS-CoV-2 virus infection. It had first was identified in December 2019 and caused a global pandemic that continues to affect all aspects of life all over the world. COVID-19 has a high risk of death from failure of respiratory system, but it may affect many different systems of the body.

Changes in thyroid hormone levels are common in any severe illness and called non-thyroidal illness. This occurs as a reaction to systemic stress. On the other hand, some reports described changes in thyroid function tests due to destruction of thyroid cells or inflammation in the gland. In this paper, the authors aimed to get more insight into the reasons for the changes that occur in thyroid function tests during COVID-19.

#### THE FULL ARTICLE TITLE

Campi I et al 2021 The spectrum of thyroid function tests during hospitalization for SARS COV-2 infection. Eur J Endocrinol 184:699–709. PMID: 33683214.

#### SUMMARY OF THE STUDY

The study included 144 patients hospitalized with COVID-19 and associated pneumonia at a single center in Milan, Italy between March and May 2020. There were 97 men and 47 women, ages ranging from 26 to 96. COVID-19 infection was confirmed in all patients by

PCR testing. Patients who previously had thyroid disease or who were taking drugs that can affect the thyroid were excluded. Serum TSH, free T<sub>3</sub>, free T<sub>4</sub>, thyroglobulin, thyroglobulin antibodies and markers of inflammation (CRP, IL-6 and cortisol) were measured. The death rate was 25% as 36 of 144 patients died.

Most of the patients had normal TSH, free T<sub>4</sub> and T<sub>3</sub> levels when they were admitted. Only 39% of patients had low TSH levels and half of these patients had low free T<sub>3</sub> levels. Serum free T<sub>3</sub> levels predicted the patients who were more likely to die from the disease. TSH and free T<sub>3</sub> levels were back to normal at the time of discharge in the patients who survived. Serum thyroglobulin levels were normal and there was no sign of destruction of thyroid cells.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that the thyroid test abnormalities seen in COVID-19 are temporary and likely caused by the response of the immune system and not from a direct effect of the virus on the thyroid cells. Evaluation of thyroid function during hospitalization is not helpful and not recommended. However, if thyroid tests are done during admission and are abnormal, it is reasonable to monitor thyroid function after hospital discharge.

— Ebru Sulanc, MD

#### ATA THYROID BROCHURE LINKS

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

Novel Coronavirus (COVID-19) and the Thyroid: <https://www.thyroid.org/covid-19/coronavirus-frequently-asked-questions/>



## THYROID FUNCTION TESTS, continued

### ABBREVIATIONS & DEFINITIONS

**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.

**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.

**Thyroglobulin:** a protein made only by thyroid cells, both normal and cancerous. When all normal thyroid tissue is destroyed after radioactive iodine therapy in patients with thyroid cancer, thyroglobulin can be used as a thyroid cancer marker in patients that do not have thyroglobulin antibodies.



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Canadian Cancer Society

 **Thyroid Federation International**

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## THYROID EYE DISEASE

# Teprotumumab improves the clinical course of thyroid eye disease

### BACKGROUND

Thyroid eye disease (TED) is a complex disease that causes inflammation of the eyes, eye muscles and the surrounding tissues. TED is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. TED can negatively affect patients' quality of life, as it can be disfiguring, and, more rarely, threaten vision. TED has two distinct phases: an acute inflammatory phase where pain, eye bulging, double vision and vision loss predominate, followed by a chronic phase, characterized by fibrosis and potential permanent eye bulging and vision changes. The best time to treat TED and prevent long term complications is during the acute inflammatory phase. However until recently, treatment options for TED have been limited.

Recently, our understanding of the causes of TED have focused on inflammation affecting cells known as fibroblasts in the eye muscles. Targeted therapies are emerging, including teprotumumab, a monoclonal antibody that blocks inflammation of the eye fibroblasts. This study reviewed the results of 2 clinical trials of teprotumumab, representing one of the largest controlled study populations of patients with TED to date.

### THE FULL ARTICLE TITLE

Kahaly GJ et al Teprotumumab for patients with active thyroid eye disease: a pooled data analysis, subgroup analyses, and off-treatment follow-up results from two randomized, double-masked, placebo-controlled, multicentre trials. *Lancet Diabetes Endocrinol.* 2021 Jun;9(6):360-372.

### SUMMARY OF THE STUDY

This is an analysis of 2 multicenter trials performed at 28 specialized centers (thyroid eye and/or orbital clinics) in Europe and America. The scoring system used to evaluate patients with TED is the Clinical Activity Score (CAS) and is based on classical signs of inflammation (pain, redness, swelling and function) and that helps predict which

patients will benefit from immunosuppressive treatment. Participants were adults with Graves' disease and recent onset ( $\leq 9$  months) active moderate-to-severe TED, defined as having a CAS  $\geq 4$ , who were randomized to receive eight infusions of intravenous teprotumumab or no drug every 3 weeks. Patients who received previous medical or surgical treatment for TED were excluded. Patients were evaluated for the difference from baseline to week 24 in the proportion of patients with a decrease in eye bulging measurements as well as reduction in CAS, improvement in symptoms and overall Graves' Ophthalmopathy Quality of Life (GO-QOL) Questionnaire results. Additionally, teprotumumab responders were examined at 7 and 51 weeks following the final infusion to assess for acute disease recurrence and long-term responses.

More patients who received teprotumumab (77%) achieved improvement in eye bulging at week 24, compared with 15% of patients who received no drug. Additionally, those with greater baseline eye bulging achieved the biggest reductions. Patients who received teprotumumab had more improvements in visions (70% vs 31%), and a larger decrease in each CAS component. There did not appear to be any worsening of symptoms after the last dose of teprotumumab. The drug was well tolerated and only 3 patients were unable to complete the trial. No new safety concerns or serious adverse events related to teprotumumab were reported during follow-up.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

These data show that teprotumumab results in significant and clinically meaningful improvement in difficult-to-treat TED outcomes, especially eye bulging and vision loss. There was no evidence of acute, rebound TED after treatment discontinuation and responses were maintained to 51 weeks after the final infusion of teprotumumab. This is a major step forward in the treatment of patients with TED.

— Alan P. Farwell, MD



## THYROID EYE DISEASE, continued

### ATA THYROID BROCHURE LINKS

Graves' Eye Disease: <https://www.thyroid.org/graves-eye-disease/>

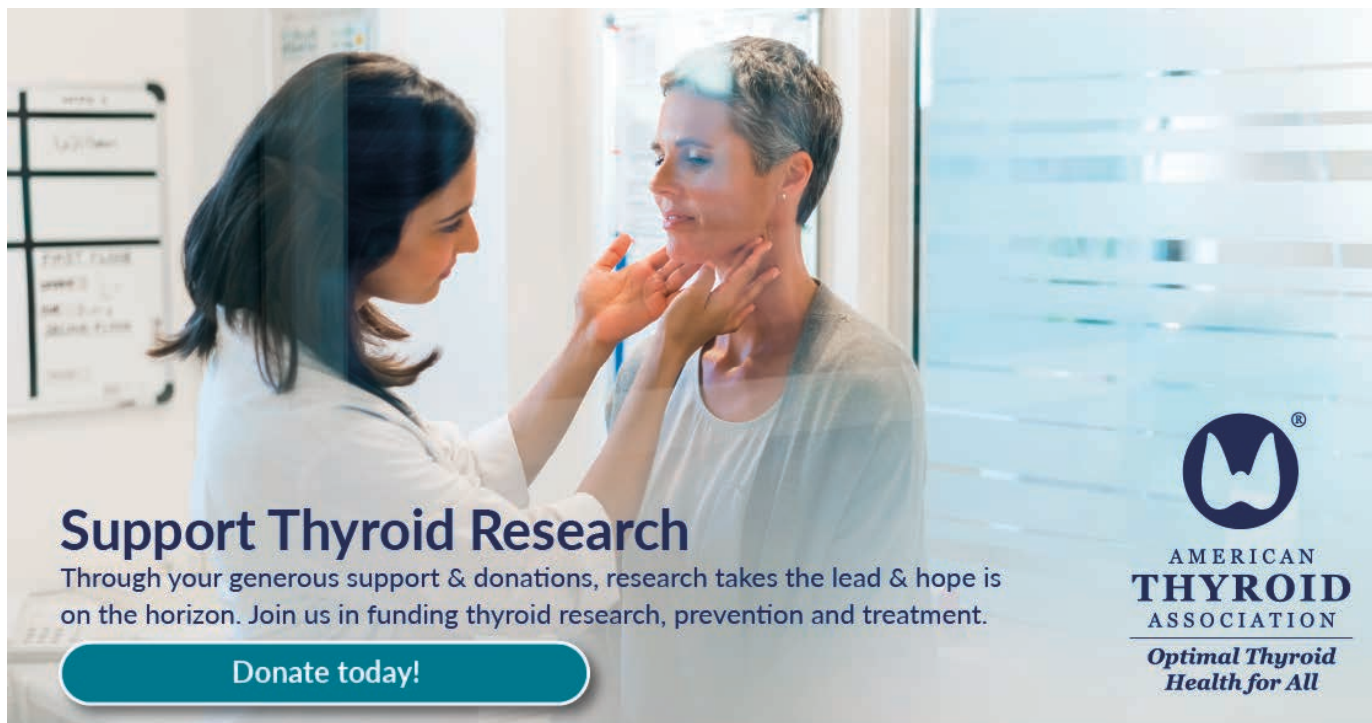
Graves' Disease: <https://www.thyroid.org/graves-disease/>

### ABBREVIATIONS & DEFINITIONS

**Thyroid eye disease (TED):** also known as Graves ophthalmopathy. TED is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. TED includes inflammation of the eyes, eye muscles and the surrounding tissues.


**Graves' disease:** the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

**CAS:** Clinical Activity Score, a scoring system used to evaluate patients with Graves' ophthalmopathy, and is based on classical signs of inflammation (pain, redness, swelling and function) and that helps predict which patients will benefit from immunosuppressive treatment



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## GRAVES' DISEASE

# Statin use associated with lower incidence of developing thyroid eye disease in patients newly-diagnosed Graves' disease

### BACKGROUND

Thyroid eye disease (TED) is a complex disease that causes inflammation of the eyes, eye muscles and the surrounding tissues. TED is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. It is thought to be due to thyrotropin (TSH) receptor antibodies attacking the cells known as fibroblasts in the eye muscles, resulting in inflammation and eye muscle enlargement. The cholesterol medications known as statins are thought to potentially have anti-inflammatory effects. In 1 study, statins were associated with a reduced risk of developing TED. To further investigate this association, this study examined the association between the use of statins and other cholesterol-lowering agents on the development of TED in patients with newly diagnosed Graves' disease.

### THE FULL ARTICLE TITLE

Nilsson A et al 2021 Statins decrease the risk of orbitopathy in newly diagnosed patients with Graves disease. *J Clin Endocrinol Metab* **106**:1325–1332

### SUMMARY OF THE STUDY

This was an analysis of a Swedish national drug and hospital visit database over the period 2005–2018. The analysis included adults with at least one hospital visit for newly diagnosed Graves' disease. Individuals were followed from the time of Graves' disease diagnosis until their first visit for TED, or until the end of 2018. A "statin user" was defined as an individual who obtained at least two prescriptions for a statin drug, starting 3 months

prior to the diagnosis of Graves' disease. The incidence of TED was then compared between statin users and statin nonusers. Additional, separate analyses were conducted to compare the use of statins against that of other lipid-lowering agents and to compare the effects of different statins.

A total of 5574 statin users and 34,409 nonusers with Graves' disease were analyzed. Statin users were found to be older, male, and more likely to be treated with radioactive iodine for their Graves' disease than were nonusers; statin users were also more likely to be using other cholesterol-lowering agents. The most common statin used was simvastatin (77.1%), followed by atorvastatin (28.9%). Overall, statin use decreased the risk of developing TED by 26%. The effect was predominantly in men, with a decreased risk of 22% for men and 9% for women. Statin use for >1 year decreased the risk of developing TED by 38%, which use <1 year reduced the risk by 23%. Analysis for other lipid-lowering agents or for the combination of statins and other lipid-lowering agents revealed no decreased risk.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The study suggests that in Swedish adults with a new diagnosis of Graves' disease, statin therapy (mostly atorvastatin and simvastatin) was associated with a small, but significant risk reduction in the development of TED, especially in men.

— Alan. P. Farwell, MD

### ATA THYROID BROCHURE LINKS

Graves' Eye Disease: <https://www.thyroid.org/graves-eye-disease/>

Graves' Disease: <https://www.thyroid.org/graves-disease/>



## GRAVES' DISEASE, continued

### ABBREVIATIONS & DEFINITIONS


**Thyroid eye disease (TED):** also known as Graves ophthalmopathy. TED is most often seen in patients with Graves' disease but also can be seen with Hashimoto's thyroiditis. TED includes inflammation of the eyes, eye muscles and the surrounding tissues.

**Graves' disease:** the most common cause of hyperthyroidism in the United States. It is caused by antibodies that attack the thyroid and turn it on.

**Cholesterol:** the general term used to describe certain fat molecules in the blood. Examples of blood lipids include cholesterol, HDL ("good") cholesterol, LDL ("bad") cholesterol and triglycerides.

**Statins:** a group of cholesterol-lowering drugs known as HMG-CoA reductase inhibitors.

SEPTEMBER  
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## HYPOTHYROIDISM

### Is a computer program better than clinicians at adjusting levothyroxine after thyroidectomy?

#### BACKGROUND

A thyroidectomy is performed to treat conditions such as thyroid cancer, goiter and hyperthyroidism. After surgery, patients must take thyroid hormone pills (levothyroxine) daily for the rest of their lives. While levothyroxine only needs to be taken once a day, finding the correct dose of this medicine can be challenging. The initial dose of levothyroxine can be determined by taking into account the patient's weight, age, sex and other medical conditions. Then serum thyrotropin (TSH) is monitored every 6 to 8 weeks, and the dose is adjusted in small increments to reach the desired TSH level. However, to ensure the medication and TSH have reached a steady equilibrium, the clinician must wait at least 6 weeks after a TSH check before the dose can be adjusted again. Consequently, it can take more than a year to reach a patient's TSH goal following thyroidectomy, during which patients may experience symptoms of hypothyroidism or hyperthyroidism.

In this study, the authors examined whether using a computerized decision aid tool (DAT) to adjust the levothyroxine dose after only two weeks would be possible. The goal of the present study was to test whether application of the DAT led to more efficient dosage adjustments for patients starting levothyroxine therapy after total thyroidectomy, as compared with the usual dosage adjustments.

#### THE FULL ARTICLE TITLE

Brun VH et al. Patient tailored levothyroxine dosage with pharmacokinetic/pharmacodynamic modeling: A novel approach after total thyroidectomy. *Thyroid*. Epub 2021 May 12

#### SUMMARY OF THE STUDY

This was a trial using a computerized decision aid (DAT) to help doctors adjust levothyroxine dose after thyroidectomy. A total of 135 adults admitted for thyroidectomy to treat toxic or nontoxic goiter, thyroid cancer or Graves' hyperthyroidism participated in the study. After surgery, all participants were started on levothyroxine at a dose

picked by their doctor. Subjects were then randomly assigned to receive the DAT or usual care. TSH and Free T<sub>4</sub> hormone levels were evaluated 2 weeks after surgery and again 5-6 weeks later. At each time point, the doctor was able to adjust the dose of levothyroxine. In the decision aid tool group, the doctor was assisted by the tool with a graphical plot that provided a recommended dosage change; however, for those in the control group, the doctor was given the lab results only. Participation in the study was stopped once the TSH target was reached. If the TSH target was not reached, participants had follow-up every 6 weeks until the TSH target was reached. The main result measured at the end of the study (called the primary endpoint) was the number of participants who reached their TSH target within 8 weeks after thyroidectomy.

Overall, 35% of patients in the decision aid tool group reached their TSH target by 8 weeks after surgery, as compared with only 15% in the control group (P= 0.006). Among the subgroups, 40% of patients with nontoxic goiters and 59% of patients with thyroid cancer in the decision aid tool group achieved the primary endpoint, as compared with 0% and 19% in the control group, respectively. Using the DAT shortened the average time to reach target TSH by 58 days in the goiter group and 40 days in the cancer group. However, the DAT was not helpful for patients with thyrotoxicosis from Grave's disease or toxic goiter.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that rather than waiting six to eight weeks for hormone levels to stabilize, the clinician can adjust the dose of levothyroxine after only two weeks when assisted by a computerized clinical decision support tool. While it is unclear whether reaching the TSH goal sooner will have a clinically significant impact, this data provides a good foundation for future research in the management of hypothyroidism and moves beyond simple weight-based dosing of thyroid replacement.

— Philip Segal, MD



## HYPOTHYROIDISM, continued

### ATA THYROID BROCHURE LINKS

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

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

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

### ABBREVIATIONS & DEFINITIONS

**Thyroidectomy:** surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a *total thyroidectomy*. When less is removed, such as in removal of a lobe, it is termed a *partial thyroidectomy*.

**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.

**Hyperthyroidism:** a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

**Goiter:** a thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

**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.



## THYROID CANCER

### Postmenopausal women whose TSH levels are kept suppressed for treatment of thyroid cancer may have lower bone density.

#### BACKGROUND

TSH regulates the thyroid and, as thyroid hormone levels increase, TSH levels decrease. After thyroidectomy for thyroid cancer, patients were often placed on levothyroxine doses that were high enough to suppress (turn off) TSH levels to prevent recurrence of the cancer. However, keeping TSH suppressed is no longer recommended for everyone because most patients with thyroid cancer have good prognosis with very low risk of progression or recurrence. Thyroid hormone plays an important role in bone health, and hyperthyroidism, where TSH is low, is known to increase risk of osteoporosis and fractures. Long-term suppression of TSH can result in adverse effects such as irregular heart rhythm or low bone density and osteoporosis. Therefore, the current American Thyroid Association (ATA) guidelines recommend keeping TSH suppressed only in patients with persistent cancer or high risk of recurrence. However, a recent survey showed that many physicians still recommend keeping TSH low in patients with thyroid cancer. Since the majority of patients with thyroid cancer live for many years, these patient may be at a risk of developing adverse effects from long-term TSH suppression.

This study evaluated potential effects of TSH suppression therapy for thyroid cancer on bone density in three different groups of patients.

#### THE FULL ARTICLE TITLE

Ku EJ et al. 2021 Effect of TSH Suppression Therapy on Bone Mineral Density in Differentiated Thyroid Cancer: A Systematic Review and Meta-analysis. *J Clin Endocrinol Metab.* Epub 2021 Jul 24. PMID: 34302730

#### SUMMARY OF THE STUDY

A total of 20 studies were reviewed. Among these, 17 studies with 1824 patients (739 patients with thyroid cancer and suppressed TSH levels and 1085 control patients without thyroid disease) who had bone mineral

density (BMD) measurement values were included. Patients were divided into three groups according to gender and menopausal status since estrogen can affect bone health: 1) postmenopausal women, 2) premenopausal women, and 3) men. The differences in BMD between thyroid cancer patients and controls were compared in each group.

TSH suppression therapy was associated with a lower BMD in lumbar spine in postmenopausal women, although there were no difference in BMD in hip. In contrast, TSH suppression therapy was associated with higher BMD in lumbar spine and hip in premenopausal women. There were no significant difference in BMD in spine or hip in men between TSH suppression therapy group and control group. In the systematic review, two studies showed that postmenopausal women treated with TSH suppression therapy had more decrease in bone density over time compared to control women, with longer duration of TSH suppression therapy associated with more bone loss.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Keeping TSH low for treatment of thyroid cancer may be associated with lower bone density in postmenopausal women. However, the adverse effects of TSH suppression therapy on bone density were not seen in premenopausal women or in men. This difference in the effects of TSH suppression therapy for different groups of patients may be related to estrogen or testosterone status, as estrogen and testosterone are known to protect against bone loss. Different groups of patient may have had different dietary habits or physical activity levels, which were not assessed. The overall number of patients included in this study is relatively small. Therefore, larger studies would be helpful in further evaluating the effects of long-term TSH suppression therapy for thyroid cancer on bone health.



## THYROID CANCER, continued

Overall, the findings of this study are consistent with what we would expect about long-term effects of TSH suppression on bone health in postmenopausal women. It is reassuring that there were no significant adverse effects of TSH suppression therapy on bone health seen

in premenopausal women or men. Given the findings, it may be advisable to monitor bone health routinely in postmenopausal women whose TSH is kept suppressed for treatment of thyroid cancer.

— Sun Y. Lee, MD

### ATA THYROID BROCHURE LINKS

Thyroid Cancer (Papillary and Follicular): <https://www.thyroid.org/thyroid-cancer/>

### ABBREVIATIONS & DEFINITIONS

**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.

**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.

**Differentiated thyroid cancer:** Types of thyroid cancer that include papillary thyroid cancer and follicular thyroid cancer

**Thyroidectomy:** surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a *total thyroidectomy*. When less is removed, such as in removal of a lobe, it is termed a *partial thyroidectomy*.

**Cancer recurrence:** this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

**Bone Mineral Density (BMD):** this is usually measured in the lumbar (lower) spine and the hip and the results give information as to the strength of the bone and the risk of fractures. The results are expressed as T scores, which as standard deviations from the average bone density in a person in their 20s, when bone mass is the highest. A T score of -1 to -2.5 is termed *Osteopenia* and a T score >2.5 is termed *Osteoporosis*.

**Osteoporosis:** decrease in bone mineral density in which the individual is at a significantly increased risk for fractures with little or no trauma or force. This occurs with a bone mineral density T score of >-2.5. The areas at highest risk for osteoporotic fractures are the wrist, spine and hip.



## THYROID AND PREGNANCY

# Iodine supplementation in pregnant women with Hashimoto's Thyroiditis

### BACKGROUND

Iodine is essential for the thyroid gland to make thyroid hormone as the thyroid hormones contain iodine. During pregnancy, requirements for thyroid hormone increase. Indeed, thyroid hormone levels often increase by nearly 50% with an associated increased daily iodine requirement of 50%. Further, the thyroid gland's size increases by 10% in countries that have plenty of iodine in their diet (such as the US) and by 20 to 40% in areas of iodine deficiency. Maintaining adequate iodine intake is essential for thyroid hormone production, which plays a vital role in the development of the baby. Therefore, for pregnant women, the World Health Organization recommends a daily intake of 250 µg of iodine. The American Thyroid Association (ATA) recommends adding to the diet a daily oral supplement that contains 150 µg of iodine in planning for pregnancy, during pregnancy, and during the postpartum period to achieve this.

Hashimoto's thyroiditis is the most common cause of hypothyroidism and is common in women during child-bearing years. Hashimoto's thyroiditis is an autoimmune condition characterized by thyroid peroxidase (TPO) antibodies. Iodine can variably affect thyroid function in patients with Hashimoto's thyroiditis, often worsening the hypothyroidism and, rarely, causing hyperthyroidism. Because of this, there is a concern that iodine supplementation in patients with Hashimoto's thyroiditis during pregnancy could potentially lead to adverse effects. This study aimed to examine the effects iodine supplementation thyroid hormone levels and TPO antibodies in pregnant women with preexisting Hashimoto's thyroiditis.

### THE FULL ARTICLE TITLE

van Heek L et al 2021 Avoidance of iodine deficiency/excess during pregnancy in Hashimoto's thyroiditis. *Nuklearmedizin*. Epub 2021 Mar 23. PMID: 33759148.

### SUMMARY OF THE STUDY

This study included 20 adult pregnant women with Hashimoto's thyroiditis who were treated at the University Hospital of Cologne, Germany, between December 1, 2012, and December 1, 2014. These patients were given iodine supplementation during pregnancy and had a serum thyroid peroxidase (TPO) antibody titer >35 IU/ml at the onset of pregnancy and at least two measurements of TPO antibody levels during pregnancy and once after pregnancy. Measurements of serum thyroid stimulating hormone (TSH) and TPO antibody levels and levothyroxine dose requirements were recorded.

Of the 20 patients, 18 were already on levothyroxine therapy for hypothyroidism. During the course of pregnancy, the levothyroxine dose was increased in 10 patients, reduced in 4, and held constant in 6. As compared with the beginning of pregnancy, TSH levels decreased by the end of pregnancy. From the onset to the 20th week of pregnancy, only 2 patients had TSH levels outside the reference range (1 below and 1 above). By the end of pregnancy, only 1 patient had a TSH below the reference range.

During early pregnancy, the average TPO antibody level was  $411 \pm 335$  IU/ml and at the end of pregnancy, it was  $137 \pm 214$  IU/mL. Serum TPO antibody levels decreased in 18 patients during pregnancy. However, in 1 patient, TPO antibodies increased from 60 IU/mL to 237 IU/mL, while in another patient, levels remained constant at 1000 IU/mL. After pregnancy, the TPO antibody levels were lower than at the beginning of pregnancy in 17 of the 20 patients, while remaining constant in 1 and increasing in 2 patients. In 2 of the 20 patients evaluated, serum TPO antibody levels at the end of pregnancy were negative.



## THYROID AND PREGNANCY, continued

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that iodine supplementation during pregnancy did not significantly affect either thyroid hormone or TPO antibody levels in women with Hashimoto's thyroiditis. While this was a small study,

these results suggest that routine iodine supplementation in the doses recommended by national guidelines may be safely given to pregnant women with preexisting Hashimoto's thyroiditis.

— Alan. P. Farwell, MD

### ATA THYROID BROCHURE LINKS

Thyroid Disease in Pregnancy: <https://www.thyroid.org/thyroid-disease-pregnancy/>

Iodine Deficiency: <https://www.thyroid.org/iodine-deficiency/>

Hashimoto's Thyroiditis: <https://www.thyroid.org/hashimotos-thyroiditis/>

### ABBREVIATIONS & DEFINITIONS

**Iodine:** an element found naturally in various foods that is important for making thyroid hormones and for normal thyroid function. Common foods high in iodine include iodized salt, dairy products, seafood and some breads.

**Hashimotos thyroiditis:** the most common cause of hypothyroidism in the United States. It is caused by antibodies that attack the thyroid and destroy it.

**Autoimmune thyroid disease:** a group of disorders that are caused by antibodies that get confused and attack the thyroid. These antibodies can either turn on the thyroid (Graves' disease, hyperthyroidism) or turn it off (Hashimoto's thyroiditis, hypothyroidism).

**TPO antibodies:** these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.

**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



## ATA Alliance for Thyroid Patient Education

**GOAL** The goal of our organizations is to provide accurate and reliable information for patients about the diagnosis, evaluation and treatment of thyroid diseases. We look forward to future collaborations and continuing to work together toward the improvement of thyroid education and resources for patients.



ThyCa: Thyroid Cancer Survivors' Association, Inc.<sup>SM</sup>  
[www.thyca.org](http://www.thyca.org)



MCT8 - AHDS Foundation

THYROID CANCER ALLIANCE



### American Thyroid Association

[www.thyroid.org](http://www.thyroid.org)

ATA Patient Resources:

[www.thyroid.org/thyroid-information/](http://www.thyroid.org/thyroid-information/)

Find a Thyroid Specialist: [www.thyroid.org](http://www.thyroid.org)

(Toll-free): 1-800-THYROID

[thyroid@thyroid.org](mailto:thyroid@thyroid.org)

### Bite Me Cancer

[www.bitemecancer.org](http://www.bitemecancer.org)

[info@bitemecancer.org](mailto:info@bitemecancer.org)

### Graves' Disease and Thyroid Foundation

[www.gdatf.org](http://www.gdatf.org)

(Toll-free): 877-643-3123

[info@ngdf.org](mailto:info@ngdf.org)

### Light of Life Foundation

[www.checkyourneck.com](http://www.checkyourneck.com)

[info@checkyourneck.com](mailto:info@checkyourneck.com)

### MCT8 – AHDS Foundation

[mct8.info](http://mct8.info)

[Contact@mct8.info](mailto:Contact@mct8.info)

### Thyca: Thyroid Cancer Survivors' Association, Inc.

[www.thyca.org](http://www.thyca.org)

(Toll-free): 877-588-7904

[thyca@thyca.org](mailto:thyca@thyca.org)

### Thyroid Cancer Alliance

[www.thyroidcanceralliance.org](http://www.thyroidcanceralliance.org)

[www.thyroidcancerpatientinfo.org](http://www.thyroidcancerpatientinfo.org)

Rotterdam, The Netherlands

### Thyroid Cancer Canada

[www.thyroidcancerCanada.org](http://www.thyroidcancerCanada.org)

416-487-8267

[info@thyroidcancerCanada.org](mailto:info@thyroidcancerCanada.org)

### Thyroid Federation International

[www.thyroid-fed.org](http://www.thyroid-fed.org)

[tfi@thyroid-fed.org](mailto:tfi@thyroid-fed.org)



AMERICAN  
**THYROID**  
ASSOCIATION  
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