

# Clinical THYROIDOLOGY FOR THE PUBLIC



AMERICAN  
THYROID  
ASSOCIATION  
FOUNDED 1923

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## EDITOR'S COMMENTS .....2

## IN MEMORIAL .....3

**Dr. E. Chester "Chip" Ridgway**

## THYROID CANCER.....5

### **Sorafenib prolongs progression-free survival of metastatic thyroid cancer patients**

While the prognosis of most thyroid cancer patients is excellent, some patients (<10%) have relentlessly progressive cancer that becomes resistant to radioactive iodine and is very difficult to treat. Fortunately, a new class of anticancer drugs, known as tyrosine kinase inhibitors (TKI), have shown to be effective in these patients. This paper reports the results of the first phase III trial of the TKI sorafenib for the treatment of thyroid cancer.

Brose MS et al on behalf of the DECISION investigators. Sorafenib in radioactive iodine-refractory, locally advanced or metastatic differentiated thyroid cancer: a randomized, double-blind, phase 3 trial. *Lancet*. April 23, 2014 [Epub ahead of print]. pii: S0140-6736(14)60421-9. doi: 10.1016/S0140-6736(14)60421-9. PMID:24768112

## THYROID CANCER.....7

### **Thyroid cancer in survivors of Hodgkin's lymphoma**

History of radiation to the head/neck region is known to be a risk factor for the development of thyroid cancer. Patients with Hodgkin's lymphoma receive radiation to the neck region as part of their treatment. This study specifically examined the long-term risk of thyroid cancer in survivors of Hodgkin's lymphoma.

Michaelson EM et al. Thyroid malignancies in survivors of Hodgkin's lymphoma. *Int J Radiation Oncol Biol Phys*. 88(3): 636-641. 2014.

## THYROID FUNCTION TESTS.....8

### **Is there an association between obesity and changes in TSH and free T<sub>3</sub> levels?**

Prior studies have reported that obese patients have slightly higher blood levels of both TSH and T<sub>3</sub> as compared to normal weight patients. It is not known whether these increases are related or if they represent independent results of obesity. The aim

of this study is to evaluate the relationship between TSH, free T<sub>4</sub> and free T<sub>3</sub> levels and weight in a large database of pediatric and adolescent patients.

Karavani G et al. Increases in thyrotropin within the near-normal range are associated with increased triiodothyronine but not increased thyroxine in the pediatric age group. *J Clin Endocrinol Metab*. May 30, 2014 [Epub ahead of print]. DOI: <http://dx.doi.org/10.1210/jc.2014-1441>.

## HYPOTHYROIDISM .....10

### **Patients with Hashimoto's thyroiditis and negative thyroid antibodies have a milder form of the disease**

Most patients with Hashimoto's thyroiditis have measurable thyroid antibodies in the blood. However, ~5 % of patients with Hashimoto's thyroiditis have no measurable thyroid antibodies. This study was performed to note any differences between patients with antibody positive and antibody negative Hashimoto's thyroiditis.

Rotondi M et al. Serum negative autoimmune thyroiditis displays a milder clinical picture compared with classic Hashimoto's thyroiditis. *Eur J Endocrinol* 2014;171:31-6. Epub April 17 2014

## SUBCLINICAL THYROID DISEASE .....12

### **There is no effect of subclinical thyroid dysfunction on bone density or hip fracture risk in older adults**

Subclinical thyroid dysfunction is common in the elderly, but its relationship to bone mineral density and hip fracture in this population remains unclear. The aim of this study was to investigate the association between subclinical hypothyroidism and hyperthyroidism and bone mineral density and hip fracture in older adults.

Garin MC et al. Subclinical thyroid dysfunction and hip fracture and bone mineral density in older adults: the Cardiovascular Health Study. *J Clin Endocrinol Metab*. May 30, 2014 [Epub ahead of print].

## ATA ALLIANCE FOR THYROID

## PATIENT EDUCATION .....14

## Calendar .....17



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# CLINICAL THYROIDOLOGY FOR THE PUBLIC

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## EDITOR'S COMMENTS

Welcome to *Clinical Thyroidology for the Public*. In this journal, we will bring to you the most up-to-date, cutting edge thyroid research. We will be providing summaries of research studies that were discussed in a recent issue of *Clinical Thyroidology*, a publication of the American Thyroid Association for physicians. These summaries are present in lay language to allow the rapid dissemination of thyroid research to the widest possible audience. This means that you are getting the latest information on thyroid research and treatment almost as soon as your physicians. As always, we are happy to entertain any suggestions to improve *Clinical Thyroidology for the Public* so let us know what you want to see.

We also provide even faster updates of late-breaking thyroid news through **Twitter** at [@thyroidfriends](https://twitter.com/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*, *ThyCa: Thyroid Cancer Survivors Association*, *Thyroid Cancer Canada* and *Thyroid Federation International*.

**September is Thyroid Cancer Awareness month.**

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

1. How effective is Sorafenib in treating resistant thyroid cancer?
2. Do survivors of Hodgkins lymphoma have an increased risk of thyroid cancer?
3. Is there an association between obesity and changes in TSH and free T<sub>3</sub> levels?
4. Is antibody-negative Hashimoto's thyroiditis a less aggressive form of hypothyroidism?
5. Does subclinical thyroid disease have any effect on bone density or hip fractures?

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



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## IN MEMORIAL

### Dr. E. Chester “Chip” Ridgway

On July 31, 2014, Dr. E. Chester “Chip” Ridgway passed away, leaving a tremendous legacy in the thyroid field. Dr. Ridgway’s accomplishments over his career are extensive and he had received most of the major awards of the American Thyroid Association and the Endocrine Society, serving as president of both societies. He had a long history of funded thyroid research, both in the basic and clinical arenas, with >200 published manuscripts. He was a devoted member of the American Thyroid Association, serving in every capacity including committee member, committee chair, American Thyroid Association board member and, as noted above, American Thyroid Association president.

At the University of Colorado School of Medicine, Dr. Ridgway held several key positions over the years, including Executive Vice Chair of Medicine, Frederic Hamilton Professor of Medicine and Senior Associate Dean for Academic Affairs. He came to the University of Colorado in 1985 to become Head of the Division of Endocrinology, Metabolism, and Diabetes, and he served in that capacity until 2007. Previously, he was Head of the Thyroid Unit at Massachusetts General Hospital, in Boston.

His research centered on thyroid stimulating hormone and its regulation of the thyroid gland, focusing specifically on the development and regulatory factors that control the alpha and beta subunits of thyroid stimulating hormone. He also extensively studied the role of thyroid hormones in altered cardiac, brain, pulmonary, skeletal muscle, hepatic, and adipocyte function associated with disorders of the thyroid gland and the identification of therapeutic strategies.

Most importantly, Dr. Ridgway was an outstanding mentor throughout his career. For these efforts, he was awarded the inaugural Lewis E. Braverman Lectureship Award in 2011 which recognizes a member of the American Thyroid Association who has demonstrated excellence and passion for mentoring fellows, students, and junior faculty and has a long history of productive thyroid research. Beginning in the Thyroid Unit at Mass General Hospital and through his positions at the University of Colorado, he influenced a tremendous number of individuals who have gone on to become leaders in their own right. A review of his pub-

lications includes many of the past and present leaders in Endocrinology. In addition to all of the fellows and trainees that had the opportunity to work directly with Dr. Ridgway, he influenced all of the clinical fellows that attended the annual University of Colorado Endocrine Fellows Conference which he founded, organized and chaired for 20 years and which is held just before the American Thyroid Association Annual Meeting. He encouraged many endocrine fellows to participate in this annual event and to become active American Thyroid Association members. As a tribute to his unwavering efforts to encourage and inspire the careers of clinical fellows and to honor his commitment to education, mentorship, scholarship and patient care, the American Thyroid Association has named this conference “The E. Chester Ridgway Fellows Conference and Trainee Track” ([See page 4](#)).

I can personally attest to Dr. Ridgway’s mentoring skills with two seminal events in my professional career. My association with Dr. Ridgway dates back the Thyroid Unit at MGH, when he hired me as clinical lab technician in 1977, then supported my progression as a research technician. My initial thyroid research project on T3 receptors in the heart took place under Dr. Ridgway’s guidance, showing that his mentorship was not limited to fellows and faculty. My experiences in the Thyroid Unit inspired me to pursue the field of Endocrinology after I entered medical school. The second event came when he was President of the American Thyroid Association and called me to become involved in an American Thyroid Association committee in 1997, asking me to Chair the Education committee. He convinced me to take the position and supported my efforts through a very active year. This experience inspired me to continue my involvement with the American Thyroid Association, which I have been serving in a variety of capacities since that time. Thus, I can say that I owe my career as an Endocrinologist and as an active member of the American Thyroid Association to Dr. Ridgway’s mentorship.

He will be deeply missed as a friend, colleague and mentor.

— Alan P. Farwell, MD



## ATA establishes a named annual meeting program in memory of Dr. Ridgway: “The E. Chester Ridgway Fellows Conference and Trainee Track”

**Ridgway legacy fund created to honor commitment to education, mentorship, scholarship and patient care**



The ATA was honored when E. Chester ‘Chip’ Ridgway, MD, founder of the Endocrine Fellows Conference (EFC), was part of the endeavor to combine his program with the ATA Trainees Track creating a seamless 4 1/2 day experience for clinical, basic, surgical trainees throughout the ATA annual meeting.

The ATA expresses tremendous gratitude to our [late President Dr. E. Chester ‘Chip’ Ridgway](#) for founding the EFC more than 20 years ago. In his memory, the ATA has created a named fund to support the “**E. Chester Ridgway Fellows Conference and Trainee Track**” in the years to come. Please lend your support to the “**E. Chester Ridgway Fellows Conference and Trainee Track**” which will continue his legacy of patient care, education, mentorship and scholarship.



To donate, go to **GiveDirect** and select **Ridgway Legacy Fund** as the Program area.

You may also call the ATA office at 703.998.8890 or email [thyroid@thyroid.org](mailto:thyroid@thyroid.org) for further assistance.



## THYROID CANCER

# Sorafenib prolongs progression-free survival of metastatic thyroid cancer patients

### BACKGROUND

Thyroid cancer is the fastest rising cancer in women. The vast majority of patients do very well after initial therapy with surgery and, occasionally, radioactive iodine therapy and their prognosis is excellent. However, some patients (<10%) have relentlessly progressive cancer that becomes resistant to radioactive iodine and is very difficult to treat – these are the patients that are at risk of dying from thyroid cancer. Fortunately, a new class of anticancer drugs, known as tyrosine kinase inhibitors (TKI), have shown to be effective in these patients. Several phase I and phase II trials of TKIs for the treatment of metastatic and progressive thyroid cancer unresponsive to radioactive iodine therapy have been published in the past few years. This paper reports the results of the first phase III trial, which established the utility of the TKI sorafenib for the treatment of thyroid cancer and was the basis for the approval of this drug by the FDA.

### THE FULL ARTICLE TITLE

Brose MS et al on behalf of the DECISION investigators. Sorafenib in radioactive iodine-refractory, locally advanced or metastatic differentiated thyroid cancer: a randomized, double-blind, phase 3 trial. *Lancet*. April 23, 2014 [Epub ahead of print]. pii: S0140-6736(14)60421-9. doi: 10.1016/S0140-6736(14)60421-9. PMID:24768112

### SUMMARY OF THE STUDY

This study included 416 patients from 77 centers in 18 countries. Patients were > 18 years, with locally advanced or metastatic radioactive iodine-resistant thyroid cancer that had progressed within the past 14 months and had not received any other chemotherapy. Patients were randomly assigned to receive either 400-mg sorafenib twice daily (total of 207 patients) or matching placebo tablets (209 patients). Of these patients, 409 had distant metastases—86% in the lungs, 51% in lymph nodes, and 27% in bone. Treatment was continued until there was progression of disease or unacceptable drug side effects. The primary end point was progression-free survival (PFS) based on evaluations every 8 weeks. The secondary end points were overall survival, time to progression, disease control rate, complete or partial objective response, stable

disease for  $\geq 4$  weeks and duration of response. Serum thyroglobulin was used as a biomarker of the cancer.

The sorafenib group had a PFS of 10.8 months, versus 5.8 months for the placebo group, although the overall survival was similar in both groups. At disease progression, 71% of patients in the placebo group crossed over to receive open-label sorafenib. Twenty percent of patients in the sorafenib group received other cancer therapy after the trial.

The objective response rate, based on CT or MR imaging was significantly better with sorafenib than with placebo. Stable disease for 6 months or longer occurred more frequently in sorafenib than placebo groups (42% versus 33%). The median time to progression was 11.1 months with sorafenib versus 5.7 months with placebo.

Of the 207 patients in the sorafenib group, 31 (15%) discontinued the drug because of an adverse event. The most frequent adverse events in the active drug group were hand-foot syndrome in 76%, diarrhea in 69%, hair loss in 67%, rash in 50%, weight loss in 47%, hypertension in 41%, anorexia in 32%, oral mucositis in 23%, and pruritus in 20%.

The thyroglobulin concentration decreased significantly in the sorafenib group but not in the placebo group.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Sorafenib significantly improved PFS as compared with placebo in patients with progressive, radioactive iodine-resistant thyroid cancer, although it did not improve overall survival. However, sorafenib has frequent, intolerable side effects that need to be considered before starting this therapy, particularly in older patients who enjoy a good quality of life despite the presence of metastatic disease in lymph nodes and lungs. The criteria for initiating therapy with a TKI such as sorafenib have not been clearly defined. It seems therefore, reasonable to reserve therapy with a TKI for patients with significant disease burden and progressive, life-threatening disease.

— M. Regina Castro, MD



## THYROID CANCER, continued

### ATA THYROID BROCHURE LINKS

Thyroid cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

Radioactive Iodine Therapy: <http://www.thyroid.org/radioactive-iodine>

### ABBREVIATIONS & DEFINITIONS

**Cancer metastasis:** spread of the cancer from the initial organ where it developed to other organs, such as the lungs and bone.

**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.

**Radioactive iodine (RAI):** this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

**Lymph node:** bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

**Sorafenib:** an anticancer drug that has been shown to be effective in thyroid cancer.

**Tyrosine kinases inhibitors (TKI):** drugs that block the effect of proteins (tyrosine kinases) that are overactive in many of the pathways that cause cells to be cancerous.

**Progression free survival (PFS):** duration of time that metastatic cancer remains stable

**Clinical trials:** when a new drug is developed, it must undergo an extensive series of steps, called phases, to prove that it is more effective in patients than the drugs that are currently available to treat the condition. A Phase I trial tests a new drug or treatment in a small group of people for the first time to evaluate its safety, determine a safe dosage range and identify side effects. A Phase II trial gives the drug to a larger group of people to see if it is effective and to further evaluate its safety. A Phase III trial gives the drug to large groups of people to confirm its effectiveness, monitor side effects, compare it to commonly used treatments and collect information that will allow the drug or treatment to be used safely.



## THYROID CANCER

### Thyroid cancer in survivors of Hodgkin's lymphoma

#### BACKGROUND

History of radiation to the head/neck region is known to be a risk factor for the development of thyroid cancer since the thyroid is directly exposed to the radiation. Patients with Hodgkin's lymphoma receive radiation to the neck region as part of their treatment. It is known that patients with Hodgkin's lymphoma have an increased risk of developing thyroid nodules, presumably due to the radiation exposure. This study specifically examined the long-term risk of thyroid cancer in survivors of Hodgkin's lymphoma.

#### THE FULL ARTICLE TITLE

Michaelson EM et al. Thyroid malignancies in survivors of Hodgkin's lymphoma. *Int J Radiation Oncol Biol Phys.* 88(3): 636-641. 2014.

#### SUMMARY OF THE STUDY

This study examined the records of 1981 patients treated for Hodgkin's lymphoma between 1969 and 2008 in a multi-institutional database located in Boston, Massachusetts. The majority of Hodgkin's lymphoma survivors in this study had been treated with radiation after the age of 20. The investigators determined that the patients with Hodgkin's lymphoma were 9.2 times more likely to develop thyroid cancer compared to the normal population and this risk increases over time. A total of

28 patients developed thyroid cancer over an average follow up time of 14.3 years, with the majority being papillary thyroid cancer. All but 2 of the 28 patients who developed thyroid cancer had received radiation therapy as part of their treatment for Hodgkin's lymphoma. Female gender and radiation therapy before the age of 20 years were risk factors for developing thyroid cancer. Although thyroid cancer was more common in Hodgkin's lymphoma patients compared to the normal population, the 10 year cumulative incidence was only 0.26%, suggesting that the overall incidence is low and that the vast majority of Hodgkin's lymphoma survivors do not develop thyroid cancer.

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

Although patients with a history of Hodgkin's lymphoma are at increased risk of thyroid cancer, the overall incidence is low. This risk is highest in women who received radiation for their disease before the age of 20 years. Long term follow up and monitoring for thyroid cancer in these patients is required.

—Whitney Woodmansee MD

#### ATA THYROID BROCHURE LINKS

Thyroid cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

#### ABBREVIATIONS & DEFINITIONS

**Hodgkin's lymphoma:** a common cancer of the lymph glands that affects mainly younger people

**Incidence:** number of new cases of a condition per year.



## THYROID FUNCTION TESTS

### Is there an association between obesity and changes in TSH and free T<sub>3</sub> levels?

#### BACKGROUND

Prior studies have reported that obese patients have slightly higher blood levels of TSH as compared to normal weight patients. In addition, and T<sub>3</sub> levels may be increased but T<sub>4</sub> levels unchanged. After weight loss, T<sub>3</sub> levels return to normal. These findings suggest that weight gain and obesity result in changes in the thyroid function, rather than the change in the thyroid function being the primary event resulting in obesity. It is not known whether the increase in TSH and T<sub>3</sub> levels are related or if they represent independent results of obesity. The aim of this study is to evaluate the relationship between TSH, free T<sub>4</sub> (FT<sub>4</sub>) and free T<sub>3</sub> (FT<sub>3</sub>) levels and weight measured by body-mass index (BMI) in a large database of pediatric and adolescent patients.

#### THE FULL ARTICLE TITLE

Karavani G et al. Increases in thyrotropin within the near-normal range are associated with increased triiodothyronine but not increased thyroxine in the pediatric age group. *J Clin Endocrinol Metab.* May 30, 2014 [Epub ahead of print]. DOI: <http://dx.doi.org/10.1210/jc.2014-1441>.

#### SUMMARY OF THE STUDY

This is a cross-sectional study of 21,023 blood samples drawn from pediatric and adolescent patients in community clinics in Jerusalem between February and November 2011. Only samples that tested all three parameters (TSH, FT<sub>4</sub>, and FT<sub>3</sub>) and had height and weight recorded within 6 months of the blood sampling available from electronic medical records were included in the analysis. Samples with TSH level above 7.5 mIU/L or from subjects with history of thyroid disease or on thyroid treatment or medications that can affect the thyroid function were excluded from analysis. Out of 3,276 samples that met the inclusion criteria, 1,317

samples were from patients 10 years old or younger and 1,959 samples were from patients 11 to 20 years old. The samples were divided in four BMI groups: underweight, normal weight, overweight and obese.

There was a positive correlation between the TSH and FT<sub>3</sub> levels in the entire group, when the samples were divided in 4 equal subgroups from the lowest to the highest TSH level, and when the samples were divided by gender or age (under 11 years vs. 11 to 20 years). No correlation was found between the TSH and FT<sub>4</sub> levels. Both TSH and FT<sub>3</sub> levels were slightly higher in the overweight and obese groups, as compared with the normal weight group. In the 1,903 samples from the normal-weight group, the FT<sub>3</sub> levels were higher in the subgroup with highest TSH than in the subgroup with the lowest TSH levels, while no difference was noted in the FT<sub>4</sub> or BMI levels.

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

This study confirmed in a large database that for normal or slightly higher than normal TSH levels, the FT<sub>3</sub> but not FT<sub>4</sub> levels increase proportionally with the increase in TSH levels within the normal weight, overweight and obese groups. These findings support the hypothesis that TSH preferentially stimulates T<sub>3</sub> rather than T<sub>4</sub> production and/or secretion. Further studies are needed to examine the relationship between TSH, T<sub>3</sub> and T<sub>4</sub> levels as well as body weight and thyroid function.

— Alina Gavrilă, MD, MMSC

#### ATA THYROID BROCHURE LINKS

Thyroid Function Tests: <http://www.thyroid.org/blood-test-for-thyroid>

Thyroid and Weight: <http://www.thyroid.org/weight-loss-and-thyroid>

#### ABBREVIATIONS & DEFINITIONS

**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.





## THYROID FUNCTION TESTS, continued

**Thyroxine ( $T_4$ ):** the major hormone produced by the thyroid gland.  $T_4$  gets converted to the active hormone  $T_3$  in various tissues in the body.

**Free thyroxine ( $FT_4$ ):** a minor proportion of  $T_4$  that is not bound to proteins in the blood.

**Triiodothyronine ( $T_3$ ):** the active thyroid hormone, usually produced from thyroxine.

**Free triiodothyronine ( $FT_3$ ):** a minor proportion of  $T_3$  that is not bound to proteins in the blood.

**Body mass index (BMI):** the weight in kilograms divided by the square of the height in meters.

**Cross-sectional study:** observational study that analyzes data from a study group collected at one time point.



## HYPOTHYROIDISM

### Patients with Hashimoto's thyroiditis and negative thyroid antibodies have a milder form of the disease

#### BACKGROUND

Hashimoto's thyroiditis, also known as chronic autoimmune hypothyroidism, is the most common cause of hypothyroidism in the United States. It is caused by antibodies that attack the thyroid and destroy it. Most patients with Hashimoto's thyroiditis have measurable antibodies in the blood, with ~90% of patients having positive TPO antibodies and ~50% of patients having positive thyroglobulin antibodies. About 5 % of patients with a diagnosis of Hashimoto's thyroiditis based on clinical grounds or by ultrasound appearance have no measurable thyroid antibodies. This study was performed to note any differences between patients with Hashimoto's thyroiditis with positive antibodies and those with Hashimoto's thyroiditis but without any antibodies present.

#### THE FULL ARTICLE TITLE

Rotondi M et al. Serum negative autoimmune thyroiditis displays a milder clinical picture compared with classic Hashimoto's thyroiditis. *Eur J Endocrinol* 2014;171:31-6. Epub April 17 2014

#### SUMMARY OF THE STUDY

Between 2008 and 2011, 55 patients were diagnosed with Hashimoto's thyroiditis without antibodies. There were 48 women and 7 men. The average age was 47.7 (ranging from ages 17-80). The comparison group included 110 patients (12 men, 98 women) with Hashimoto's thyroiditis and positive antibodies. The researchers made the diagnosis of antibody negative Hashimoto's thyroiditis by the following criteria: 1) An ultrasound showing the characteristic a hypoechoic pattern of Hashimoto's thyroiditis, 2) two blood TSH levels >4.0 mU/ml within

2-6 months of each other and. 3) the absence of serum TPO or thyroglobulin antibodies on two occasions.

Overt hypothyroidism (increased TSH and low T<sub>4</sub> levels) was more common in patients with positive thyroid antibodies at the time of diagnosis, while subclinical hypothyroidism (only an increase in TSH) was more common in patients with antibody-negative Hashimoto's thyroiditis. TSH and thyroid volume were also higher in these patients. Family history of thyroid disease was more common in patients with antibody positive Hashimoto's thyroiditis.

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

Patients with Hashimoto's thyroiditis and positive thyroid antibodies were more likely present with overt hypothyroidism and a larger thyroid. Patients with antibody-negative Hashimoto's thyroiditis had a milder form of hypothyroidism at the time of diagnosis. This could represent an earlier stage of the disease or simply a less aggressive form of Hashimoto's thyroiditis. This study suggests that treating patients with subclinical hypothyroidism and positive thyroid antibodies is important to prevent the development of overt hypothyroidism.

— Heather Hofflich, DO

#### ATA THYROID BROCHURE LINKS

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

Thyroiditis: <http://www.thyroid.org/what-is-thyroiditis>

Thyroid Function Tests: <http://www.thyroid.org/blood-test-for-thyroid>

#### ABBREVIATIONS & DEFINITIONS

**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).

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



## **HYPOTHYROIDISM**, continued

**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 pill

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

**Thyroiditis:** inflammation of the thyroid, most commonly cause by antibodies that attack the thyroid as seen in Hashimoto's thyroiditis and post-partum thyroiditis. It can also result from an infection in the thyroid.

**Thyroid Ultrasound:** a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound

uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

**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.

**Thyroglobulin 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.

## Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravelets™ will be donated to the ATA. The month of September is **Thyroid Cancer Awareness Month** and a bracelet is available through the [ATA Marketplace](#) to support thyroid cancer awareness and education related to thyroid disease.





## SUBCLINICAL THYROID DISEASE

# There is no effect of subclinical thyroid dysfunction on bone density or hip fracture risk in older adults

### BACKGROUND

It is well known that overt thyroid dysfunction, especially hyperthyroidism, is associated with osteoporosis in both men and women. Subclinical thyroid dysfunction, in which the TSH is abnormal but the  $T_4$  and  $T_3$  levels are normal, is common in the elderly, but its relationship to bone mineral density and hip fracture in this population remains unclear. Several previous studies examining the effects of subclinical thyroid dysfunction on bone have had mixed results. The aim of this study was to investigate the association between subclinical hypothyroidism and hyperthyroidism and bone mineral density and hip fracture in older adults.

### THE FULL ARTICLE TITLE

Garin MC et al. Subclinical thyroid dysfunction and hip fracture and bone mineral density in older adults: the Cardiovascular Health Study. *J Clin Endocrinol Metab.* May 30, 2014 [Epub ahead of print].

### SUMMARY OF THE STUDY

A total of 4936 men and women aged 65 years and older who were enrolled in the Cardiovascular Health Study and not taking thyroid hormone preparations were included in the study. Eligible individuals were identified from Medicare eligibility rosters between 1989 and 1993. Thyroid stimulating hormone (TSH) was measured at baseline and at subsequent visits in 1992–1993, 1994–1995 and 1996–1997 in the majority of participants. Free  $T_4$  was measured in individuals with abnormal serum TSH values. Serum total  $T_3$  was measured in subjects with serum TSH  $<0.10$  mIU/L. Based on their initial thyroid-function tests, participants were classified as euthyroid (TSH, 0.45–4.50 mIU/L), subclinically hypothyroid (TSH, 4.50–20 mIU/L), or subclinically

hyperthyroid (TSH,  $<0.45$  with normal  $FT_4$  and  $T_3$ ). Among the participants, 678 had subclinical hypothyroidism and 82 had subclinical hyperthyroidism. Over 12 years of follow-up, 564 hip fractures occurred, out of which 160 were in men.

The study found that patients with subclinical thyroid dysfunction did not have an increased hip fracture risk as compared to individuals with normal thyroid function. There was also no association between thyroid function and spine or hip bone density among the 1317 participants with bone densitometry measurements. Risk on bone density and fracture risk could not be assessed in patients with subclinical hyperthyroidism due to small numbers.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study did not find an association between subclinical thyroid dysfunction and bone mineral density at the spine, total hip or femoral neck, as well as hip fracture risk in older men and women. This is an important finding, as controversy exists in regards to decision making on treatment of subclinical thyroid dysfunction in older adults, who are undeniably more vulnerable to fractures. Further studies are needed to examine the effects of treatment of subclinical thyroid dysfunction on bone.

— Maria Papaleontiou, MD

### ATA THYROID BROCHURE LINKS

Thyroid and the Elderly: <http://www.thyroid.org/hypothyroidism-elderly>

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

Hyperthyroidism: <http://www.thyroid.org/what-is-hyperthyroidism>

## DEFINITIONS AND ABBREVIATIONS

**Overt Hypothyroidism:** clear hypothyroidism an increased TSH and a decreased  $T_4$  level. All patients with overt hypothyroidism are usually treated with 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.



## **SUBCLINICAL THYROID DISEASE, continued**

**Overt Hyperthyroidism:** a condition where the thyroid gland is overactive and produces too much thyroid hormone.

**Subclinical Hyperthyroidism:** a mild form of hyperthyroidism where the only abnormal hormone level is a decreased TSH.

**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.

**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.

**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:** a 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.



## 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 towards the improvement of thyroid education and resources for patients.

### WHO WE ARE (in alphabetical order)

- **American Thyroid Association**
- **Bite Me Cancer**
- **Graves' Disease and Thyroid Foundation**
- **Light of Life Foundation**
- **ThyCa: Thyroid Cancer Survivors' Association, Inc.**
- **Thyroid Cancer Canada**
- **Thyroid Federation International**

### AMERICAN THYROID ASSOCIATION

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

ATA Patient Resources: <http://www.thyroid.org/patients/>

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

Phone (toll-free): 1-800-THYROID

e-mail: [thyroid@thyroid.org](mailto:thyroid@thyroid.org)

**ATA Mission:** The ATA leads in promoting thyroid health and understanding thyroid biology.

**ATA Vision:** The ATA is the leading organization focused on thyroid biology and the prevention and treatment of thyroid disorders through excellence and innovation in research, clinical care, education, and public health.

**ATA Values:** The ATA values scientific inquiry, clinical excellence, public service, education, collaboration, and collegiality.

To further our mission, vision and values the ATA sponsors "Friends of the ATA" online to advance the information provided to patients and the public such as this publication, *Clinical Thyroidology for the Public*. We welcome your support.

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





## ATA Alliance for Thyroid Patient Education

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### BITE ME CANCER

<http://www.bitemecancer.org>

Bite Me Cancer was formed as a nonprofit foundation in September, 2010, by Nikki Ferraro, who was 17-years old at the time. Nikki was diagnosed with a rare form of thyroid cancer in April 2010 when she was a junior at Chantilly HS in Virginia. Nikki was determined to lead a Relay for Life team just two weeks after her diagnosis. She named the team Bite Me Cancer and experienced immediate success. When Nikki decided to create a foundation a few months later, she wanted to continue the legacy of her team name and thus her foundation became the Bite Me Cancer Foundation.

e-mail: [info@bitemecancer.org](mailto:info@bitemecancer.org)

### GRAVES' DISEASE AND THYROID FOUNDATION

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

Phone (toll-free): 1-877-NGDF-123 or 643-3123

e-mail: [Gravesdiseasefd@gmail.com](mailto:Gravesdiseasefd@gmail.com)

Founded in 1990, the Graves' Disease Foundation offers support and resources to Graves' disease patients, their families, and health care professionals. Their mission is to find the cause of and the cure for Graves' thyroid disease through research, to improve the quality of life for persons with Graves' disease and their caregivers and to educate persons with Graves' disease, their caregivers, healthcare professionals, and the general public about Graves' disease and its treatment. The web site features a monitored bulletin board.

### LIGHT OF LIFE FOUNDATION

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

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

The Light of Life Foundation, founded in 1997, is a nonprofit organization that strives to improve the quality of life for thyroid cancer patients, educate the public and professionals about thyroid cancer, and promote research and development to improve thyroid cancer care.

### THYCA: THYROID CANCER SURVIVORS' ASSOCIATION, INC.

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





## ATA Alliance for Thyroid Patient Education

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

Phone (toll-free): 877 588-7904

e-mail: [thyca@thyca.org](mailto:thyca@thyca.org)

ThyCa: Thyroid Cancer Survivors' Association, Inc., founded in 1995, is an international nonprofit organization, guided by a medical advisory council of renowned thyroid cancer specialists, offering support and information to thyroid cancer survivors, families, and health care professionals worldwide.

### THYROID CANCER CANADA

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

Phone: 416-487-8267

Fax: 416-487-0601

e-mail: [info@thyroidcancercanada.org](mailto:info@thyroidcancercanada.org)

Thyroid Cancer Canada is a non-profit organization founded in 2000. The organization works towards creating an environment in which people who are dealing with thyroid cancer, especially the newly diagnosed, are met with support and information. Their goals & objectives include facilitating communication among thyroid cancer patients, providing credible information about the disease, providing emotional support, and assisting thyroid cancer patients with voicing their needs to health care professionals and those who are responsible for health care policy.

### THYROID FEDERATION INTERNATIONAL

<http://www.thyroid-fed.org/>

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

Thyroid Federation International (TFI) was established in Toronto in 1995. Thyroid Federation International aims to work for the benefit of those affected by thyroid disorders throughout the world by providing a network of patient support organizations.

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







## ATA Alliance for Thyroid Patient Education

### CALENDAR

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#### **FREE PUBLIC HEALTH FORUM** **Thyroid Disease and You**

**Saturday, November 1, 2014, 1:00 pm – 3:00 pm**  
**Coronado/San Diego, California**

Thyroid Experts from the American Thyroid Association and thyroid patients join together to inform the general public, other thyroid patients, and their friends and families about: **Thyroid Disease and You**

Concerned about low energy?...Memory loss?...Fatigue?...Depression? ...Rapid heartbeat?...Restlessness?... Infertility?...Weight or hair changes?... A lump on your neck?... Could it be your thyroid?

Physician experts will discuss thyroid disorders. This program is free and all are welcome, including walk-in-attendees. Reservations are encouraged to ensure we have enough seating.

For more information and to register, please e-mail ThyCa at [thyca@thyca.org](mailto:thyca@thyca.org)

Phone: 1-619-435-6611

[See flier on page 18.](#)

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#### **THYCA ANNUAL MEETING** **17th International Thyroid Cancer Survivors' Conference**

**October 17-19, 2014, Denver, Colorado**

- The latest research, advances in treatment and follow-up, plus issues for survivors and caregivers, and coping skills for well-being
- More than 100 sessions. For everyone whose life has been touched by thyroid cancer—people being tested, those newly diagnosed, long-term survivors, people with advanced disease, caregivers, and friends
- Featuring leading physicians plus other specialists—more than 50 speakers
- Meet and learn from experts. Share experiences with others with thyroid cancer.

<http://www.thyca.org/support/conferences>

[See flier on page 19.](#)

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#### **GRAVES' DISEASE AND THYROID FOUNDATION** **Kids and Graves' Disease — Special Seminar for Parents**

**November 22, 2014, Childrens Hospital of Philadelphia**

The Foundation's patient & family conferences are designed to help attendees learn more about Graves' Disease, thyroid eye disease, and related disorders. Guest speakers include physicians, researchers, and allied health professionals. Attendees will also be able to share their own experiences and connect with fellow patients and family members.

<http://gdatf.org/conference>

# FREE Public Health Forum

Thyroid Experts from the American Thyroid Association and thyroid patients join together to inform the general public, other thyroid patients, and their friends and families about:

## Thyroid Disease and You



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Concerned about low energy?...Memory loss?...Fatigue?...  
Depression? ...Rapid heartbeat?...Restlessness?...Infertility?...  
Weight or hair changes?... A lump on your neck?... Could it be your thyroid?

**Saturday, November 1, 2014**

1:00 pm – 3:00 pm

Coronado/San Diego, California

Hotel Del Coronado

1500 Orange Avenue, Coronado, California 92118

Phone: 1-619-435-6611

### **Physician experts will discuss thyroid disorders.**

This program is free and all are welcome, including walk-in-attendees. Reservations are encouraged to ensure we have enough seating. For more information and to register, please e-mail ThyCa at [thyca@thyca.org](mailto:thyca@thyca.org).

### **Who should attend?**

Anyone who has had an overactive or underactive thyroid, thyroiditis, a thyroid nodule, thyroid cancer, or a family history of thyroid problems or related disorders, including rheumatoid arthritis, juvenile diabetes, pernicious anemia, or prematurely gray hair (starting before age 30) Please come if you have questions, symptoms, or concerns about a thyroid problem. Receive free educational materials.

### **Reservations requested. Walk-ins welcome.**

*\$15 one-day, self-parking; \$20 valet parking. Nearby street parking available as well.*

E-mail [thyca@thyca.org](mailto:thyca@thyca.org) to RSVP

(Please indicate in your message the thyroid condition you are most concerned about.)

*Online educational information for patients is provided by all members of the ATA Alliance for Patient Education co-sponsoring this forum: ThyCa: Thyroid Cancer Survivors' Association, Graves' Disease and Thyroid Foundation, Light of Life Foundation, Bite Me Cancer, Thyroid Cancer Canada and Thyroid Federation International. Go online to [www.thyroid.org](http://www.thyroid.org) and click on "Public and Patients" to access the resources you need.*

*You're invited to the  
17th International*

# Thyroid Cancer Survivors' Conference

Sponsored by ThyCa: Thyroid Cancer Survivors' Association, Inc.<sup>SM</sup>

**October 17 - 19, 2014**

**Denver, Colorado**

Doubletree by Hilton Denver Hotel  
3203 Quebec Street  
Denver, CO 80207



- The latest research, advances in treatment and follow-up, plus issues for survivors and caregivers, and coping skills for well-being
- More than 100 sessions. For everyone whose life has been touched by thyroid cancer—people being tested, those newly diagnosed, long-term survivors, people with advanced disease, caregivers, and friends
- Featuring leading physicians plus other specialists—more than 50 speakers
- Meet and learn from experts. Share experiences with others with thyroid cancer.
- Registration information and more details:
  - Individual: •Regular \$50 •Annual members \$40 •Lifetime members \$35 •Added family members/guests \$30
  - Early-bird discount: \$5 off if postmarked or sent online by September 17, 2014.
  - Scholarships are available to cover the registration fee. Use the scholarship line on the registration form.
  - Walk-in attendees are welcome. The conference opens at 8 a.m. Friday. Sessions go from 9:30 a.m. to 5:15 p.m. on Friday; from 8 a.m. to 5:15 p.m. on Saturday; and from 8 a.m. to 3:30 p.m. on Sunday. Each day, there are 5 -7 choices of topics and speakers in different rooms at every time period throughout the day.
  - Hotel's Special Room Rate for conference attendees is \$89 for a single or double, plus tax; triple \$99; quad \$109. The hotel is convenient to area attractions. Free parking, plus free shuttle to and from Denver International Airport.

***Save the dates! Please share this flyer with others. For details & registration form:***

Visit .....**www.thyca.org**

E-mail .....conference@thyca.org or thyca@thyca.org

Write.....ThyCa: Thyroid Cancer Survivors' Association, Inc.

P.O. Box 1545, New York, NY 10159-1545

Call toll-free .....1-877-588-7904



ThyCa: Thyroid Cancer Survivors' Association, Inc. is an international non-profit 501(c)(3) organization of thyroid cancer survivors, family members, and health care professionals, dedicated to education, communication, support, awareness for early detection, and thyroid cancer research fundraising and research grants.