

# Clinical THYROIDOLOGY FOR PATIENTS



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Carlé A et al. Graves' hyperthyroidism and moderate alcohol consumption: evidence for disease prevention. *Clin Endocrinol* 2013;79:111-119. Epub April 19, 2013.

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Perez CL et al. Serum thyrotropin levels following levothyroxine administration at breakfast. *Thyroid* 2013;23:779-84. Epub June 21, 2013.

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Exposure of the thyroid to radiation at a young age is a well-established risk factor for the development of thyroid cancer. Dental x-rays are likely the most common source of radiation to the thyroid. The purpose of this study was to determine the risk of thyroid cancer in relation to various diagnostic radiation tests.

Neta G et al. A prospective study of medical diagnostic radiography and risk of thyroid cancer. *Am J Epidemiol* 2013;177:800-9. Epub March 15, 2013; doi: 10.1093/aje/kws315.

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Thyroid cancer presents as a thyroid nodule. There has been controversy in the literature about whether the risk of thyroid cancer in patients with multiple thyroid nodules or hyperthyroidism is different than the risk of cancer in patients with single thyroid nodules. This study looked at how frequently thyroid cancer was found in patients undergoing thyroid surgery because of Graves' disease, multinodular goiter and toxic nodular goiter.

Smith JJ et al. Cancer after thyroidectomy: a multi-institutional experience with 1,523 patients. *J Am Coll Surg* 2013;216:571-9. Epub February 8, 2013.

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Thyroid cancer is a fast rising cancer in men. Thyroid cancer in men has generally been felt to have a worse prognosis than in women. The present study examined sex as a prognostic factor in thyroid cancer through an analysis of more than 60,000 cases in the SEER database.

Nilubol N et al. Multivariate analysis of the relationship between male sex, disease-specific survival, and features of tumor aggressiveness in thyroid cancer of follicular cell origin. *Thyroid* 2013;23:695-702. Epub May 28, 2013; doi: 10.1089/thy.2012.0269.

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**Clinical Thyroidology for Patients**

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# CLINICAL THYROIDOLOGY **FOR PATIENTS**

A publication of the American Thyroid Association

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## EDITOR'S COMMENTS

Welcome to *Clinical Thyroidology for Patients*, bringing to you, the patient, the most up-to-date, cutting edge thyroid research. What you read here as research studies will likely become the accepted practice in the future. *Clinical Thyroidology for Patients* is published on a monthly basis and includes summaries of research studies that were discussed in a recent issue of *Clinical Thyroidology*, a publication of the American Thyroid Association for physicians. This means that you, the patients, are getting the latest information on thyroid research and treatment almost as soon as your physicians.

We will be providing even faster updates of late-breaking thyroid news through **Twitter** at [@thyroidfriends](https://twitter.com/thyroidfriends) and on **Facebook**. Our goal is to provide you with the tools to be the most informed thyroid patient in the waiting room.

Also check out our friends in the **ATA Alliance for Thyroid Patient Education**. The Alliance member groups consist of: the *American Thyroid Association*, the *Graves' Disease and Thyroid Foundation*, the *Light of Life Foundation*, *ThyCa: Thyroid Cancer Survivors Association*, *Thyroid Cancer Canada* and *Thyroid Federation International*.

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

- Does moderate drinking prevent Graves' disease?
- Can you take your levothyroxine with breakfast?
- Do dental x-rays cause thyroid cancer?
- What is the risk that multinodular goiters contain a cancer?
- Is being male a prognostic factor in thyroid cancer?

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



## GRAVES' DISEASE

### Drinking alcohol reduces the risk of developing Graves' disease

#### BACKGROUND

Drinking alcohol has been reported to have a protective effect in preventing some cardiovascular diseases and autoimmune disorders. Drinking alcohol in moderation has been reported to decrease the risk for developing hypothyroidism. There is, however, a lot of controversy regarding a possible link between drinking alcohol and developing hyperthyroidism. Graves' disease, an autoimmune disorder, is the most common cause of hyperthyroidism. The present study reports the findings from the Danish iodination program in drinking alcohol and developing Graves' disease.

#### THE FULL ARTICLE TITLE

Carlé A et al Graves' hyperthyroidism and moderate alcohol consumption: evidence for disease prevention. *Clin Endocrinol* 2013;79:111-119. Epub April 19, 2013.

#### SUMMARY OF THE STUDY

From 1997 to 2000 the populations of two districts of Denmark were enrolled in a study of iodine deficiency and all newly diagnosed cases of hyperthyroidism were studied. A diagnosis of Graves' disease required positive blood levels of the Graves' antibody and/or typical results from a thyroid nuclear scan. A total of 484 patients with Graves' disease were identified and patients were asked to fill out a questionnaire that asked information on alcohol consumption and the presence of other existing medical conditions. A total of 272 patients identified with newly diagnosed Graves' disease and 1018 patients without Graves' disease from the same population were evaluated. Alcohol consumption was evaluated during the year before the diagnosis and at the maximum during any calendar

year of the subjects' lives. The age of the patients ranged from 20 to 79 years. About 30% of the patients with Graves' disease had cardiovascular diseases.

Approximately 88% of the patients without Graves' disease reported some degree of alcohol consumption while only 72% of patients with Graves' disease drank alcohol. This protective effect was true even at low levels of alcohol consumption and was slightly more pronounced at higher level of alcohol consumption. There was no difference noted between types of alcohol consumption—beer, wine or spirits.

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

This study suggests that even a small amount of weekly alcohol consumption (one bottle of beer or one glass of wine) seems to reduce the risk of developing Graves' disease, independent of age, sex and smoking. This effect is higher with moderate alcohol consumption (1-2 glasses of wine or similar amount of any other kind of alcohol per day). This study adds to the potential health benefits of mild to moderate alcohol consumption.

— M. Regina Castro, MD

#### ATA THYROID BROCHURE LINKS

Graves' disease: <http://www.thyroid.org/what-is-graves-disease>

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

#### 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).

**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.

**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.



## THYROID HORMONE THERAPY

### Taking levothyroxine with breakfast may be fine for many patients

#### BACKGROUND

Levothyroxine is the most common therapy for the treatment of hypothyroidism as it is the same as the major thyroid hormone produced by the thyroid gland. The absorption of levothyroxine in the gut is decreased when taking the hormone at the same time as calcium, iron and some foods and other drugs. Because of this, patients are usually instructed to take levothyroxine on an empty stomach 30-60 minutes before food intake to avoid erratic absorption of the hormone. For many patients, this means first thing in the morning before breakfast. This is often difficult for many patients, especially those on multiple medications. This study was performed to see if patients can take their levothyroxine with food in the morning and not have to wait 30-60 minutes.

#### THE FULL ARTICLE TITLE

Perez CL et al. Serum thyrotropin levels following levothyroxine administration at breakfast. *Thyroid* 2013;23:779-84. Epub June 21, 2013.

#### SUMMARY OF THE STUDY

This study was performed in Brazil and included 45 patients who had a diagnosis of hypothyroidism and a normal TSH level on levothyroxine therapy. For 90 days patients were assigned either to take the levothyroxine 30-60 minutes before a meal or during the morning meal. Then after 90 days, they switched to the other regimen. TSH levels were assessed at baseline, 45, 90, 135 and 180 days after the start of the study. Patients reported all of their food intake at breakfast. As expected, 90% of the patient population was women.

The average TSH at the start of the study was 1.7. The TSH level was higher when levothyroxine was taken during breakfast (TSH 2.9) as compared with group who waited 30-60 minutes before taking levothyroxine (TSH 1.9). Patient preference was assessed at the end of the study and 41% preferred taking levothyroxine and waiting, 33% preferred taking the levothyroxine with breakfast and 26% indicated no preference.

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

This study shows that the absorption of levothyroxine is indeed decreased when taking the hormone with breakfast. Despite an increase in TSH while taking the hormone with breakfast, the TSH remained within the normal range. Thus, while taking levothyroxine with breakfast could be an alternative regimen for patients who have difficulties taking the hormone on an empty stomach, this regimen is more likely to cause variability in the TSH level. It is still advised that patients with a history of thyroid cancer, those who are pregnant or those who are very sensitive to changes in their TSH level need to likely wait 30-60 minutes prior to taking their levothyroxine.

— Heather Hofflich, DO

#### ATA THYROID BROCHURE LINKS

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

Thyroid Hormone Treatment: <http://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.

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

**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.



## THYROID CANCER

### Repeated dental x-rays without neck shielding increases risk of thyroid cancer

#### BACKGROUND

Exposure of the thyroid to radiation at a young age is a well-established risk factor for the development of thyroid cancer. Currently, diagnostic x-ray procedures are a leading source of exposure to radiation in the United States. Further, dental x-rays are likely the most common source of radiation to the thyroid. There have been prior studies that have examined the link between dental x-rays and thyroid cancer with mixed results. It is currently standard procedure in the United States to provide thyroid shielding to patients when taking dental x-rays. The purpose of this study was to determine the risk of thyroid cancer in relation to various diagnostic radiation tests.

#### THE FULL ARTICLE TITLE

Neta G et al. A prospective study of medical diagnostic radiography and risk of thyroid cancer. *Am J Epidemiol* 2013;177:800-9. Epub March 15, 2013; doi: 10.1093/aje/kws315.

#### SUMMARY OF THE STUDY

This study looked at 75,494 radiology techs being followed since 1982 and looked at questionnaires collected in 1994-1998 and 2003-2005 of self-reported personal medical information regarding x-ray tests received and whether they developed thyroid cancer. The diagnostic x-ray procedures that potentially involve radiation exposure to the thyroid gland included x-rays of the skull, cervical spine, head and neck, chest, and thoracic and lumbar spine; dental x-rays; mammograms; barium swallow examinations; angiograms; and upper gastrointestinal tract series.

A total of 251 techs developed thyroid cancer (0.03%) of which 187 were papillary thyroid cancer. The average age of the techs was 38 years and all subjects were older than age 22 at entry into the study. Techs that

developed thyroid cancer were more likely to be female, nonsmokers and obese.

An increased number and frequency of dental x-ray examinations was associated with an increased risk of all types of thyroid cancer. The increase in thyroid cancer risk from dental x-rays was associated with exposure before 1970 (when thyroid shielding was not practiced), but there was no evidence that the increased risk was associated with childhood or adolescent exposure. No other diagnostic radiation exposure was associated with an increased risk of thyroid cancer. In addition, radiotherapy to the head was associated with a 2.7-fold increased risk of thyroid cancer.

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

Repeated dental x-ray examinations before 1970 in this population and radiotherapy to the head are associated with increased risk of thyroid cancer. This is likely due to the lack of thyroid shielding prior to 1970. As always, patients should minimize radiation exposure by only having necessary tests and utilizing a lead apron with thyroid shield when getting dental x-rays.

— Ronald B. Koppersmith, MD, FACS

#### ATA THYROID BROCHURE LINKS

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

Childhood Head and Neck Irradiation: <http://www.thyroid.org/pediatric-endocrinology>

#### ABBREVIATIONS & DEFINITIONS

**Dental x-rays:** x-ray studies taken of the teeth looking for cavities during a visit to the dentist



## THYROID CANCER

### High risk of thyroid cancer in patients with multinodular goiter

#### BACKGROUND

Thyroid cancer is common and the incidence is increasing rapidly, especially in women. Thyroid cancer presents as a thyroid nodule. There has been controversy in the literature about the risk of thyroid cancer in patients with multiple thyroid nodules (multinodular goiter) as well as with Graves' disease and toxic nodular goiters which are the most common causes of hyperthyroidism. Initially, studies suggested that patients with Graves' disease, multinodular goiter and toxic nodular goiter carried a lower risk of thyroid cancer than patients with only a single thyroid nodule. However, recent studies suggested a higher risk of cancer in these patients (10-20%). This study looked at how frequently thyroid cancer was found in patients undergoing thyroid surgery because of Graves' disease, multinodular goiter and toxic nodular goiter.

#### THE FULL ARTICLE TITLE

Smith JJ et al. Cancer after thyroidectomy: a multi-institutional experience with 1,523 patients. *J Am Coll Surg* 2013;216:571-9. Epub February 8, 2013.

#### SUMMARY OF THE STUDY

This study reviewed studies from 3 centers in the United States. A total of 1523 patients underwent thyroid surgery between 2000 and 2011. All patients with cancer or indeterminate fine needle aspiration biopsy findings before the operation were excluded from this analysis. The risk of thyroid cancer was calculated and analysis was performed to identify the risk factors for thyroid cancer. The total risk of cancer was 16% in the studies and was similar in all 3 centers. The average cancer size was 1.1 cm and 39% of cancers were larger than 1 cm. Younger age, male sex and presence of nodules were associated with higher risk of thyroid cancer. The highest

risk of cancer was found in toxic nodular goiter (18%) and the lowest risk in Graves' disease (6%).

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

This study suggests that the risk of thyroid cancer in patients with multiple nodules is high as nearly one in five patients with multiple nodules had thyroid cancer. However, this does represent a selected population as all of these patients went to surgery, so the results cannot be applied to all patients with multiple nodules. Despite this, it is clear that the risk of thyroid cancer in patients with multiple nodules is not less than those with single nodules. Further, this study confirms that patients with Graves' disease to have a lower risk of thyroid cancer. Finally, this study does suggest that total thyroidectomy by an experienced surgeon should be more considered in patients with multiple nodules, especially in males and younger patients.

— Jamshid Farahiti, MD

#### ATA THYROID BROCHURE LINKS

Thyroid Nodules: <http://www.thyroid.org/what-are-thyroid-nodules>

Goiter: <http://www.thyroid.org/what-is-a-goiter>

Graves' disease: <http://www.thyroid.org/what-is-graves-disease>

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

Thyroid Surgery: <http://thyroid.org/patients/patient-brochures/surgery.html>

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

#### ABBREVIATIONS & DEFINITIONS

**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.

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## **THYROID CANCER**, continued

**Thyroid nodule:** an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (Benign), ~5% are cancerous.

**Thyroid fine needle aspiration biopsy (FNAB):** a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to with-draw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

**Indeterminate thyroid biopsy:** this happens usually when the diagnosis is a follicular or hurthle cell lesion. Follicular and hurthle cells are normal cells found in the thyroid. Current analysis of thyroid biopsy results cannot differentiate between follicular or hurthle cell cancer from noncancerous adenomas. This occurs in 15-20% of biopsies and often results in the need for surgery to remove the nodule.

**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.

**Toxic nodular goiter:** characterized by one or more nodules or lumps in the thyroid that may gradually grow and increase their activity so that the total output of thyroid hormone in the blood is greater than normal.

**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.

**Prospective study:** a research study in which a group of individuals who have one or more common characteristics are followed over time.

## The ATA is Getting Social



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Facebook

[www.facebook.com/ThyroidAssociation](http://www.facebook.com/ThyroidAssociation)

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## THYROID CANCER

### Male sex is not an independent prognostic factor for thyroid cancer

#### BACKGROUND

Thyroid cancer is more common in women than men and is frequently noted to be the fastest rising cancer in women. However, it is also a fast rising cancer in men as well. Thyroid cancer in men has generally been felt to have a worse prognosis than in women. The present study examined sex as a prognostic factor in thyroid cancer through an analysis of more than 60,000 cases in the Surveillance, Epidemiology, and End Results (SEER) database.

#### THE FULL ARTICLE TITLE

Nilubol N et al. Multivariate analysis of the relationship between male sex, disease-specific survival, and features of tumor aggressiveness in thyroid cancer of follicular cell origin. *Thyroid* 2013;23:695-702. Epub May 28, 2013; doi: 10.1089/thy.2012.0269.

#### SUMMARY OF THE STUDY

Over 61,523 adult patients with thyroid cancer were analyzed from the SEER database. Patients were divided into four groups based on cancer pathology: group 1 had moderately differentiated thyroid cancer, group 2 had papillary thyroid cancer with Hurthle cells, group 3 had poorly differentiated thyroid and group 4 had undifferentiated thyroid cancer. At a mean follow-up time of 54 months, men had significantly more thyroid

cancer in aggressive groups (group 3 and 4) than women. Furthermore, men had significantly more advanced disease at presentation with larger primary cancer size, higher rates of spread of the cancer outside the thyroid and more cancer spread to the lymph nodes within the neck and spread to sites outside the neck. Further analysis suggested that sex was a significant prognostic factor associated with death from thyroid cancer, although it was not an independent predictor of death.

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

This study shows that men with thyroid cancer are more likely to present with more advanced and aggressive cancers. Male sex, however, is not an independent prognostic factor for survival and the worse survival of men with thyroid cancer can be attributed to more advanced cancer at the time of presentation. More aggressive screening of men to detect thyroid cancer at an earlier stage might be expected to improve outcomes.

— Frank Crantz, MD

#### ATA THYROID BROCHURE LINKS

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

#### ABBREVIATIONS AND DEFINITIONS

**SEER:** Surveillance, Epidemiology and End Results program, a nation-wide anonymous cancer registry generated by the National Cancer Institute that contains information on 26% of the United States population. Website: <http://seer.cancer.gov/>

**Papillary thyroid cancer:** the most common type of thyroid cancer.

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



## ATA Alliance for Thyroid Patient Education

### WELCOME

The American Thyroid Association is pleased to welcome our two newest members, **Thyroid Federation International** and **Thyroid Cancer Canada**, to the 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

[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 Patients*. We welcome your support.

#### 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.

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



Thyroid Cancer Canada  
Cancer de la thyroïde Canada





## ATA Alliance for Thyroid Patient Education

Continued...

### 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.

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



Thyroid Cancer Canada  
Cancer de la thyroïde Canada

