

Clinical THYROIDOLOGY FOR PATIENTS



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VOLUME 6 • ISSUE 1 • 2013

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EDITOR'S COMMENTS 2

HYPOTHYROIDISM 3

Weight gained after quitting smoking may be caused by onset of hypothyroidism

There have been many studies examining the association between tobacco smoke and various types of thyroid disease. Despite this, the overall relationship between smoking and hypothyroidism is not clearly defined. The aim of this study was to assess the association between smoking and the development of thyroid disease.

Carlé A et al. Smoking cessation is followed by a sharp but transient rise in the incidence of overt autoimmune hypothyroidism—a population-based, case-control study. Clin Endocrinol 2012;77:764-72.

THYROID CANCER 4

Smoking and alcohol consumption in relation to risk of thyroid cancer in post-menopausal women

The relationship between lifestyle factors, such as smoking and drinking, and the risk of thyroid cancer, is not well understood. The authors of this study examined the relationship between smoking and drinking and the risk of being diagnosed with thyroid cancer in a large national study following women after menopause (Women's Health Initiative Study).

Kabat GC et al. Smoking and alcohol consumption in relation to risk of thyroid cancer in postmenopausal women. Cancer Epidemiology 2012;36:335-340.

HYPOTHYROIDISM 5

Valproic acid therapy causes subclinical hypothyroidism in children with seizure disorders

Several drugs that are used to treat seizures can affect the lab tests for the thyroid hormones as well as some that can cause hypothyroidism. Valproic acid is a highly effective drug to treat seizures, especially in children. This study was performed to determine if valproic acid has any effect on thyroid function.

Kim SH et al. Subclinical hypothyroidism during valproic acid therapy in children and adolescents with epilepsy. Neuropediatrics 2012;43:135-9. Epub May 22, 2012; doi: 10.1055/s-0032-1313913.

THYROID NODULES 6

Microcalcifications and intranodular macrocalcifications are often found on preoperative ultrasounds of papillary thyroid carcinoma

Certain characteristics of thyroid nodules on ultrasound are associated with thyroid cancer. The presence of small amounts of calcifications in thyroid nodules is concerning for papillary cancer. The current study was done to look at a large number of thyroid nodules to determine which patterns of calcification are predictive of thyroid cancer as confirmed at surgery.

Kim BK et al. Relationship between patterns of calcification in thyroid nodules and histopathologic findings. Endocrine J. October 6, 2012 [Epub ahead of print] EJ12-0294.

THYROID CANCER 8

Bilateral central-node dissection with total thyroidectomy for papillary thyroid cancer often results in permanent hypoparathyroidism

While surgeons remove abnormal-looking lymph nodes during thyroid surgery for papillary cancer, there is debate about whether patients benefit from having all neck lymph nodes in the central neck removed at the time of surgery. Most experts agree that removing all the lymph nodes in the central neck increases the risk of potential complications caused by surgery. This study examined the frequency of complications in patients that had a central neck dissection at the time of thyroid surgery.

Giordano D et al. Complications of central neck dissection in patients with papillary thyroid carcinoma: results of a study on 1087 patients and review of the literature. Thyroid 2012;22:911-7. Epub July 24, 2012.

ATA ALLIANCE FOR THYROID PATIENT EDUCATION 10

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Clinical Thyroidology for Patients

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CLINICAL THYROIDOLOGY **FOR PATIENTS**

A publication of the American Thyroid Association

VOLUME 6 • ISSUE 1 • 2013

EDITOR'S COMMENTS

Welcome to our 6th year of **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 continuing to 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 you with the tools to be the most informed thyroid patient in the waiting room. Please feel free to submit questions as well as suggestions as to how we can better serve thyroid patients.

The **Calendar of Events** highlights educational forums and support groups that are organized around the country by members of the **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:

- Is gaining weight after quitting smoking caused by hypothyroidism?
- Does smoking and alcohol consumption change your risk for developing thyroid cancer?
- Do children with seizure disorders need to be screened for hypothyroidism?
- Can you diagnose papillary thyroid cancer on ultrasound alone?
- What are the risks for removing all lymph nodes in the central neck during thyroid cancer surgery?

Have a Happy and Healthy New Year!

— Alan P. Farwell, MD



HYPOTHYROIDISM

Weight gained after quitting smoking may be caused by onset of hypothyroidism

BACKGROUND

There have been many studies examining the association between tobacco smoke and various types of thyroid disease. In particular, thyroid antibodies, which play a role in the development of hypothyroidism from autoimmune thyroid disease, may rise after stopping smoking. Further, cigarette smoke contains chemicals that may affect thyroid function. In particular, chemicals known as thiocyanates can inhibit thyroid function and cause enlargement of the gland. Despite this, the overall relationship between smoking and hypothyroidism is not clearly defined. The aim of this study was to assess the association between smoking (especially quitting smoking) and the development of thyroid disease.

THE FULL ARTICLE TITLE

Carlé A et al. Smoking cessation is followed by a sharp but transient rise in the incidence of overt autoimmune hypothyroidism—a population-based, case-control study. Clin Endocrinol 2012;77:764-72.

SUMMARY OF THE STUDY

The authors studied 140 patients with autoimmune hypothyroidism from a large Danish population. Participants provided details about their smoking habits including smoking cessation and other lifestyle factors and were compared with 560 individuals from the same population.

While current smoking was not associated with a risk of developing hypothyroidism, the risk of developing new onset hypothyroidism within 2 years of quitting smoking was increased more than 6-fold. In fact, within 2 years after smoking cessation, the percentage of cases of hypothyroidism attributable to smoking cessation was 85%. Weight gain is common after smoking cessation and this may be related to the onset of hypothyroidism as patients newly diagnosed with hypothyroidism were ~16 pounds heavier than those who did not develop hypothyroidism.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests a relationship between smoking and hypothyroidism, but not the one expected. Despite the fact that cigarette smoke contains chemicals that can inhibit thyroid function, hypothyroidism was seen only after quitting smoking. Since it is very common for patients to gain weight after stopping smoking, it is important to realize that the onset of hypothyroidism may be making the weight gain worse.

— Philip Segal, MD

ATA THYROID BROCHURE LINKS

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

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).

Thiocyanates: chemicals that inhibit thyroid function and can cause thyroid enlargement (goiter). Cigarette smoke contains thiocyanates.

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

**THYROID CANCER****Smoking and alcohol consumption in relation to risk of thyroid cancer in post-menopausal women****BACKGROUND**

Thyroid cancer is the 8th most common cancer in women and its incidence is increasing. No risk factors other than ionizing radiation have been identified for thyroid cancer. The relationship between lifestyle factors, such as smoking and drinking, and the risk of thyroid cancer, is not well understood. Cigarette smoke contains substances that can affect thyroid function in large doses. Studies of the relationship between thyroid cancer and cigarette smoking have been contradictory. Most studies of alcohol consumption have found no association with thyroid cancer. The authors of this study examined the relationship between smoking and drinking and the risk of being diagnosed with thyroid cancer in a large national study following women after menopause (Women's Health Initiative Study).

THE FULL ARTICLE TITLE

Kabat GC et al. Smoking and alcohol consumption in relation to risk of thyroid cancer in postmenopausal women. *Cancer Epidemiology* 2012;36:335-340.

SUMMARY OF THE STUDY

In this study, 159,340 post-menopausal women were followed in multiple clinical centers. The women in the study filled out questionnaires at baseline, which included information on smoking habits, as well as personal and medical history. The follow-up status of the women was checked one to two times a year after enrollment in the study and any new diagnosis of cancer reported by the women was checked by review of medical records. Most of the women in this study were of white race (88%). At

the end of the 12.7 years of follow-up, there were 331 new cases of thyroid cancer reported in the women (1 out of every 481 women). Out of the 331 cases of thyroid cancer, the types of thyroid cancer included: 276 papillary, 36 follicular, 6 anaplastic, 10 medullary and 3 others. Surprisingly, current smokers were found to have a significantly reduced risk of developing thyroid cancer as compared to women who were former smokers or non-smokers. There was no significant relationship between the amount or years smoked with developing thyroid cancer. Alcohol intake was not significantly related to thyroid cancer risk in this study.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Surprisingly, this study suggests that the risk of developing thyroid cancer may be lower in women after menopause who are current smokers, compared to those who are not. The cause for this "protective" effect is unknown. However, there were only 11 women with thyroid cancer in this study who were current smokers which limits the analysis. The risk of developing thyroid cancer should be considered in the context of the greater risk of smoking to health, in general. Thus, the findings of this study should not deter general population health efforts to promote stopping smoking, as stopping smoking is far more likely to have greater overall health benefits for Americans.

— Anna Sawka, DO

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

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

Follicular thyroid cancer: the second most common type of thyroid cancer.

Medullary thyroid cancer: a relatively rare type of thyroid cancer that often runs in families. Medullary cancer arises from the C-cells in the thyroid.

Anaplastic thyroid cancer: a very rare but very aggressive type of thyroid cancer. In contrast to all other types of thyroid cancer, most patients with anaplastic thyroid cancer die of their cancer and do so within a few years.

**HYPOTHYROIDISM****Valproic acid therapy causes subclinical hypothyroidism in children with seizure disorders****BACKGROUND**

Most cases of hypothyroidism are caused by autoimmune process where antibodies attack the thyroid and destroy the gland. Subclinical (mild) hypothyroidism, where the only abnormality is an increased TSH level, is more common than overt hypothyroidism where the TSH is increased and the thyroid hormones decreased. A variety of drugs can also affect the thyroid. These effects range from altering lab tests for the thyroid hormones without affecting thyroid function to causing frank hypo- or hyperthyroidism. There are several drugs that are used to treat seizures that can affect the lab tests for the thyroid hormones as well as some that can cause hypothyroidism. Valproic acid is a highly effective drug to treat seizures, especially in children. This study was performed to determine if valproic acid has any effect on thyroid function.

THE FULL ARTICLE TITLE

Kim SH et al. Subclinical hypothyroidism during valproic acid therapy in children and adolescents with epilepsy. *Neuropediatrics* 2012;43:135-9. Epub May 22, 2012; doi: 10.1055/s-0032-1313913.

SUMMARY OF THE STUDY

A total of 61 children who were taking valproic acid for more than 6 months were studied. They were compared to 141 children who were not taking this medication. Both sets of children had their thyroid function tests measured at regular intervals. This included a TSH, Free T₄, total T₃ and TPO antibodies (a marker of thyroid autoimmunity).

Valproic acid levels were also measured. The average age of the children was 10 years.

In all children, TPO antibodies were negative indicating no thyroid autoimmunity and T₄ and T₃ levels were in the normal range. Overall the TSH level was elevated in the children treated with valproic acid. The TSH level was >4 mU/L in 52% of the children taking valproic acid as compared with 17% of those not taking the drug. Further, a TSH >10 was found in 8.2% of the children taking valproic acid while none of the children not on the drug had a TSH >10. No child had symptoms or clinical features of hypothyroidism. Finally, the TSH normalized in 7/8 children that were taken off valproic acid.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Subclinical hypothyroidism is common in children on valproic acid and occurs in the presence of an otherwise normal thyroid gland. The cause of this is unknown but appears to be reversible when the drug is stopped. This study demonstrates that children on valproic acid should be screened periodically for hypothyroidism.

— Heather Hofflich, DO

ATA THYROID BROCHURE LINKS

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

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

ABBREVIATIONS & DEFINITIONS

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.

Thyroxine (T₄): the major hormone produced by the thyroid gland. T₄ gets converted to the active hormone T₃ in various tissues in the body.

Triiodothyronine (T₃): the active thyroid hormone,

usually produced from thyroxine.

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

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.

**THYROID NODULES**

Microcalcifications and intranodular macrocalcifications are often found on preoperative ultrasounds of papillary thyroid carcinoma

BACKGROUND

Thyroid nodules are commonly seen in adults (2%-6% of patients on palpation, up to 50% on ultrasound). It is generally recommended that ultrasound examination be part of the evaluation for possible cancer in all thyroid nodules. While the diagnosis of thyroid cancer requires a fine needle biopsy and/or thyroid surgery, certain characteristics of nodules on ultrasound are associated with thyroid cancer. However, ultrasound by itself is not sufficient to diagnose a thyroid cancer. The presence of small amounts of calcifications in thyroid nodules (microcalcifications) on ultrasound is highly specific for papillary cancer. Large amounts of calcifications (macrocalcifications) at one point suggested that a thyroid nodule was benign but this now has shown not to be the case. The current study was done to look at a large number of thyroid nodules to determine which patterns of calcification are predictive of thyroid cancer as confirmed at surgery.

THE FULL ARTICLE TITLE

Kim BK et al. Relationship between patterns of calcification in thyroid nodules and histopathologic findings. *Endocrine J.* October 6, 2012 [Epub ahead of print] EJ12-0294.

SUMMARY OF THE STUDY

A total of 1431 thyroid nodules in 1078 patients were evaluated following thyroid surgery at a single institution. Preoperative thyroid ultrasounds were performed in all cases. Calcifications were characterized as microcalcification, annular-like peripheral calcification, crescent-like

calcification, intranodular macrocalcification or a calcified spot. The average size of a nodule was 1.2 cm and 91.1% of the nodules removed were thyroid cancers (94.7% papillary cancer). Calcifications were detected in 38.6% of all nodules, 40.2% of cancerous nodules and 22.2% of benign nodules. The only forms of calcification associated with thyroid malignancy were microcalcification and intranodular macrocalcification. The authors concluded that microcalcification (42.9%) and intranodular macrocalcification (26.5%) were found frequently in the preoperative ultrasounds of patients later found at surgery to have thyroid cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Thyroid ultrasound is the best study to initially characterize thyroid nodules. The presence of either microcalcifications or intranodular macrocalcifications on thyroid ultrasound is highly associated with thyroid cancer. These nodules should be considered cancer until proven otherwise and should be targeted for further evaluation with fine needle biopsy and/or surgery.

— Frank Crantz, MD

ATA THYROID BROCHURE LINKS

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

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

Thyroid surgery: <http://www.thyroid.org/why-thyroid-surgery>

ABBREVIATIONS & DEFINITIONS

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 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.

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)

continued on next page



THYROID NODULES, continued

or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

Microcalcifications: small flecks of calcium within a thyroid nodule, usually seen as small bright spots on

ultrasonography. These are frequently seen in nodules containing papillary thyroid cancer.

Macrocalcifications: large flecks of calcium that can be seen either inside a thyroid nodule or in the periphery (so called egg-shell/rim calcifications), usually seen as large bright spots on ultrasonography.

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**THYROID CANCER****Bilateral central-node dissection with total thyroidectomy for papillary thyroid cancer often results in permanent hypoparathyroidism****BACKGROUND**

Papillary cancer is the most common type of thyroid cancer. Papillary cancer most frequently spreads outside of the thyroid into the lymph nodes in the central neck. Indeed, patients with papillary thyroid carcinoma frequently have small amounts of cancer within lymph nodes in the central neck, even though these lymph nodes appear normal on the surface. While surgeons remove abnormal-looking lymph nodes during thyroid surgery for papillary cancer, there is debate about whether patients benefit from having all neck lymph nodes in the central neck removed at the time of surgery. While the benefit of removing lymph nodes with small amounts of cancer is debatable, most experts agree that removing all the lymph nodes in the central neck increases the risk of potential complications caused by surgery. The two types of complications associated with thyroid surgery and removal of the lymph nodes include damage to the recurrent laryngeal nerve, which can cause hoarseness or airway obstruction, and damage to the parathyroid glands, which can cause calcium levels to drop to dangerously low levels and require calcium supplementation. This study examined the frequency of these complications in patients that had a central neck dissection at the time of thyroid surgery.

THE FULL ARTICLE TITLE:

Giordano D et al. Complications of central neck dissection in patients with papillary thyroid carcinoma: results of a study on 1087 patients and review of the literature. *Thyroid* 2012;22:911-7. Epub July 24, 2012.

SUMMARY OF THE STUDY

The authors looked at 1097 patients between 1980 and 1996 who underwent surgery for thyroid cancer. These patients were treated either with thyroidectomy alone, thyroidectomy with the removal of lymph nodes in the central neck on only one side or with removal of lymph

nodes in the central neck on both sides. They looked at the rate of injury to the recurrent laryngeal nerves and whether patients developed hypoparathyroidism.

The authors found that regardless of whether patients underwent removal of the lymph nodes of the neck or not, the rate of recurrent laryngeal nerve problems was the same. Temporary problems with the parathyroid glands were more likely if lymph nodes were removed on either one or both sides, and permanent problems with the parathyroid glands were more like to occur if the lymph nodes were removed on both sides.

The authors therefore concluded that limiting the removal of lymph nodes to one side would reduce the number of permanent problems related to the parathyroid glands.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The removal of normal appearing lymph nodes in the central neck at the time of thyroid surgery for cancer is a controversial topic even amongst experts. While there are good arguments for and against this practice, it is clear from this study as well as others that the potential for post-operative complications is higher with more extensive surgery. It is important for patients to discuss the extent of surgery that will be performed and the potential risks with their surgeon and endocrinologist.

— Ronald B. Kuppersmith, MD, FACS

ATA THYROID BROCHURE LINKS

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

Thyroid Surgery: <http://www.thyroid.org/why-thyroid-surgery>

continued on next page



THYROID CANCER, continued

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.

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

Central neck compartment: the central portion of the neck between the hyoid bone above, and the sternum and collar bones below and laterally limited by the carotid arteries.

Hypocalcemia: low calcium levels in the blood, a complication from thyroid surgery that is usually

short-term and relatively easily treated with calcium pills. If left untreated, low calcium may be associated with muscle twitching or cramping and, if severe, can cause seizures and/or heart problems.

Parathyroid glands: usually four small glands located around the thyroid that secrete parathyroid hormone (PTH) which regulates the body's calcium levels.

Hypoparathyroidism: low calcium levels due to decreased secretion of parathyroid hormone (PTH) from the parathyroid glands next to the thyroid. This can occur as a result of damage to the glands during thyroid surgery and usually resolves. This may also occur as a result of autoimmune destruction of the glands, in which case it is usually permanent.



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

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

Find a Thyroid Specialist: www.thyroid.org

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

e-mail: 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

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

e-mail: 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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Thyroid Cancer Canada
Cancer de la thyroïde Canada



Light of Life Foundation
checkyourneck.com





ATA Alliance for Thyroid Patient Education

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LIGHT OF LIFE FOUNDATION

www.checkyourneck.com

email: 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

Phone (toll-free): 877 588-7904

e-mail: 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

Phone: 416-487-8267

Fax: 416-487-0601

e-mail: 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

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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