Clinical THYROIDOLOGY FOR PATIENTS

VOLUME 6 • ISSUE 12 • 2013

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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 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 environmental exposure to perchorlate and thiocyanate affect thyroid hormone levels?
- What are the effects of iodine supplementation during pregnancy?
- Do benign thyroid nodules require long-term follow-up?
- Can testing for the BRAF mutation on thyroid biopsy samples help guide the extent of surgery performed?
- Do thyroid cancer patients who have Hashimoto's thyroiditis have a better prognosis?

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.

Have a Happy Holiday Season!

— Alan P. Farwell, MD

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THYROID AND THE ENVIRONMENT

High environmental exposure to perchlorate and thiocyanate, in combination with low urinary iodine, is associated with decreased thyroid hormone levels

BACKGROUND

Iodine, an essential component of thyroid hormone, is transported into thyroid cells through a specialized channel called the sodium-iodine symporter (NIS). When iodine levels in the body are low (i.e. from reduced dietary intake), transport of iodine across NIS may fall. Similarly, compounds such as perchlorate (an industrial chemical) and thiocyanate (a byproduct of cyanide found in food and tobacco smoke) inhibit NIS potentially reducing iodine transport and blocking the production of thyroid hormone. Human exposure to these compounds in the environment has been well documented and can be detected by high levels of perchlorate or thiocyanate in the urine. Previous research suggests that either of these compounds alone may reduce thyroid hormone levels although the effect is quite small. In this study, the authors examined whether exposure to all three of these factors – low iodine, increased perchlorate and increased thiocyanate – will have a substantially larger effect in reducing thyroid hormone levels.

THE FULL ARTICLE TITLE

Steinmaus C et al. Combined effects of perchlorate, thiocyanate, and iodine on thyroid function in the National Health and Nutrition Examination Survey 2007-08. Environ Res 2013;123:17-24. Epub March 7, 2013.

SUMMARY OF THE STUDY

The study used data from the National Health and Nutrition Examination Survey (NHANES 2007-2008). The NHANES 2007-2008 is large population-based survey designed to collect information on the health and nutrition of adults and children in the United States. Participants were categorized into three groups: Group A (the reference group) had the lowest levels of perchlorate and thiocyanate in the urine and high levels of urine iodine (>100mcg/L). Group B had the middle levels of perchlorate and thiocyanate in the urine and high levels of urine iodine (>100 mcg/L). Group C had the highest levels of perchlorate and thiocyanate in the urine and low levels of urinary iodine (<100mcg/l). There were 390 participants in group A, 533 in group B and 64 in group C. Serum total thyroxine (T_4) levels were 2.5% lower in individuals with high urine thiocyanate concentration and 5% lower in those with high urine perchlorate concentration. However, when the three groups (Group A-C) were analyzed T_4 was 5.1% lower in group B and 12.9% lower in group C as compared to the reference group A. In other words those with low iodine intake who also had the highest exposure to both perchlorate and thyocyanate had markedly reduced T_4 production, more so than exposure to any one single factor.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The findings from this study provide evidence that exposure to perchorate and thiocyanate act in combination to decrease thyroid hormone production in those patients with low iodine in their diet. These results will be important in developing public health policy since thyroid hormone is critical to neurodevelopment during infancy and childhood.

— Philips Segal, MD

ATA THYROID BROCHURE LINKS

Iodine Deficiency: http://www.thyroid.org/iodine-deficiency

ABBREVIATIONS & DEFINITIONS

NIS: Sodium-iodine symporter – a specialized channel that transports iodine into thyroid cells.

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.

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

Perchlorate: an industrial chemical that is a component of rocket fuel. Perchlorate blocks the Sodium-iodine symporter and decreases iodine entry into thyroid cells.

Thiocyanate: a byproduct of cyanide found in food and tobacco smoke. Thiocyanate blocks the Sodium-iodine symporter and decreases iodine entry into thyroid cells

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THYROID AND PREGNANCY

Iodine use does not affect the small changes in free thyroxine (FT_4) levels during late pregnancy

BACKGROUND

Iodine is needed to make the thyroid hormones, of which thyroxine (T_4) is the main hormone. In regions of iodine deficiency, the lack of iodine in the diet can lead to hypothyroidism. This is especially concerning during pregnancy when an increase in thyroid hormone production is needed. This increase can tip a woman that had normal thyroid function before pregnancy into hypothyroidism. This is important because some studies have shown that low levels of T_4 in pregnant women may be associated with brain development problems in their babies. Low thyroxine levels may result from low iodine in the diet and/or represent normal changes that occur in pregnancy. This study was done to see if iodine use during early pregnancy is able to prevent the small decreases in T_4 levels that occur during later pregnancy. All of the women had normal thyroid hormone levels at the beginning of pregnancy.

THE FULL ARTICLE TITLE

Brucker-Davis F et al Iodine supplementation throughout pregnancy does not prevent the drop in FT_4 in the second and thirds trimesters in women with normal initial thyroid function. Eur Thyroid J. July 16, 2013 [Epub ahead of print].

SUMMARY OF THE STUDY

This was a study of 111 pregnant women in France during 2007-2008. Women were assigned to take either a multivitamin containing 150 mcg iodine daily or a placebo pill. Iodine supplementation was begun in the first trimester and continued until 3 months after delivery. The researchers measured iodine levels in the mothers' urine and FT_4 (free thyroxine) levels in mothers' blood throughout the study. Notably, there were no measurements done related to the mothers' babies, including their urine iodine, thyroid hormone or brain development tests.

In both groups, women's FT_4 levels decreased by about 20% during late pregnancy. Iodine use did not correct the small drop in FT_4 levels among the women. However, it does improve the low iodine levels of the pregnant women and prevented the rise of a thyroid protein in the blood called thyroglobulin which, if elevated, shows lack of iodine in the diet.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In this study, the drop in FT_4 in later pregnancy is likely related to the normal changes of pregnancy and not decreased iodine in the diet, since the levels of other thyroid hormone and proteins also fell. Better tests to more accurately measure FT_4 during pregnancy are needed. Also, the study's results may not apply to pregnant women who have abnormal thyroid blood tests at baseline or those with positive thyroid antibodies.

Importantly, this study does not argue against iodine supplementation in pregnant women. Even mildly low iodine in the diet during pregnancy has been associated with poor measures of brain development. Iodine supplementation at the recommended levels is safe. The American Thyroid Association recommends that women thinking about pregnancy, who are pregnant and who breastfeed take a multivitamin containing 150 mcg of iodine once a day.

— Angela Leung, MD

ATA THYROID BROCHURE LINKS

Iodine Deficiency: http://www.thyroid.org/iodine-deficiency

Thyroid and Pregnancy: http://www.thyroid.org/thyroid-disease-and-pregnancy

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

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THYROID AND PREGNANCY, continued

ABBREVIATIONS & DEFINITIONS

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

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

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

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THYROID NODULES

Do benign thyroid nodules require long-term follow-up?

BACKGROUND

Thyroid nodules are quite common in the population, being present in about half of all adults. Approximately 5% of nodules are cancerous and most of the latter represent low-grade malignancies. Fine needle biopsy of large or suspicious nodules seen on ultrasound examination is the procedure of choice for evaluating such nodules. Once a biopsy is read as benign there should be a <1% risk that the nodule is actually cancerous. One question that is unanswered is how long a benign nodule should be monitored to see if there is a change in the nodule that would warrant further evaluation or a repeat biopsy. The present study attempts to answer this question by looking at the outcome of patients who had follow-up examination for less than 3 years or continued exams for 3 or more years after the initial fine needle biopsy.

THE FULL ARTICLE TITLE

Lee S et al. The biopsy-proven benign thyroid nodule: is long-term follow-up necessary? J Am Coll Surg 2013;217:81-9. Epub May 6, 2013.

SUMMARY OF THE STUDY

The records of 848 patients who underwent a fine needle biopsy at MD Anderson Cancer Center between 1998 and 2009 and were found to have benign cytology were reviewed. Of these patients, 92 had surgery, 280 had no further follow-up, 226 had follow-up at less than 3 year intervals and 140 had follow-up at 3 or more years after the initial biopsy. The average follow-up in the short follow-up group was 13 months as compared to 57 months in the long follow-up group. As expected, the long follow-up group patients had more ultrasounds and more repeat thyroid biopsies performed. A total of 26 nodules had a 2nd biopsy with the most common reason being increased growth. Of these, 20 were still read as benign, 3 were follicular lesions (higher risk for cancer), 2 were nondiagnostic and 1 was suspicious for papillary thyroid cancer (which was proven at surgery). Only 2 cancers were found and these were picked up within 3 years of follow-up.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that since long-term follow-up of patients with thyroid nodules that are initially read as benign does not improve the cancer detection rate, but does increase the use of ultrasound or repeat fine needle aspirations, consideration should be given to stopping further follow-up after 3 years.

This suggestion would be welcome news to patients who would be able to forego the time and expense of continued visits to the endocrinologist, repeat ultrasounds and potentially, repeat fine needle biopsies of the thyroid. However, further studies are required before this can be considered on a regular basis.

— Glenn D. Braunstein, M.D.

ATA THYROID BROCHURE LINKS

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

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

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) 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.

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THYROID NODULES, continued

Inadequate/Insufficient biopsy: this happens with not enough cells are obtained during the biopsy to provide a diagnosis. This occurs in 5-10% of biopsies. This often results in the need to repeat the biopsy.

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.

Suspicious thyroid biopsy: this happens when there are atypical cytological features suggestive of, but not diagnostic for malignancy. Surgical removal of the nodule is required for a definitive diagnosis.

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THYROID CANCER

BRAF mutation is not an independent predictor of spread of thyroid cancer to the lymph nodes the classical variant of papillary thyroid cancer

BACKGROUND

Thyroid cancer is the fastest rising cancer in women. Papillary cancer is the most common type of thyroid cancer. While the prognosis of papillary cancer is excellent, in some patients the cancer is more aggressive and spreads to the lymph nodes early. Analysis of genetic mutations in papillary cancer reveals one mutation, BRAF V600E, may be associated with a more aggressive course. This mutation can be detected on thyroid biopsies prior to surgery.
In general, there is controversy regarding the surgical treatment of papillary cancer as to how extensive the initial surgery should be. Specifically, the issue is whether to remove only lymph nodes that appear abnormal by ultrasound or at the time of surgery or to remove all lymph nodes found in the central neck (i.e. behind and around the thyroid), which is termed prophylactic surgery. The aim of this study was to determine if the presence of the BRAF mutation predicted the spread of the cancer to the lymph node in the central neck. If it did, then the BRAF mutation status could be used to justify removing all of the lymph nodes in the central neck at the time of the initial surgery.

THE FULL ARTICLE TITLE

Li C et al. Does BRAF V600E mutation predict aggressive features in papillary thyroid cancer? Results from four endocrine surgery centers. J Clin Endocrinol Metab 2013;98:3702-12. Epub August 22, 2013.

SUMMARY OF THE STUDY

The study included 388patients who underwent surgery for papillary cancer between January 2009 and December 2011 at four endocrine surgery centers (Mayo Clinic, University of Michigan, Cornell and Johns Hopkins). All patients had lymph nodes removed from the central neck. In 76% of patients this was prophylactic surgery, while there was evidence of lymph node involvement prior to surgery in 24% of patients. The patients were divided into three groups based on the pathology: classical variant papillary cancer (315 patients), follicular variant papillary cancer (41) and aggressive variant papillary cancer (32).

The BRAF mutation prevalence was found to be 80.3% in the classical variant, 39% in the follicular variant and 87.5% in the aggressive variant papillary cancer. Analysis of all of the groups found that BRAF mutation, cancer size >2 cm and extension of the cancer outside of the thyroid were predictors of spread of the cancer to the lymph nodes. When only the classical papillary cancer was analyzed, there was no significant association between BRAF mutation and spread of the cancer to the lymph nodes.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

BRAF mutation appears to be an independent predictor of spread of the cancer to the lymph nodes in the central neck only in those patients with more aggressive types of papillary cancer and not in the most common classical variant. Because of this, more studies are needed the BRAF mutation can be considered a reliable factor to guide the surgical treatment of patients with papillary cancer.

— Alan P. Farwell, MD

ATA THYROID BROCHURE LINKS

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

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

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THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

BRAF gene: this is gene that codes for a protein that is involved in a signaling pathway and is important for cell growth. Mutations in the BRAF gene in adults appear to cause cancer.

Cancer-associated genes: these are genes that are normally expressed in cells. Cancer cells frequently have mutations in these genes. It is unclear whether mutations in these genes cause the cancer or are just associated with the cancer cells. The cancer-associated genes important in thyroid cancer are BRAF, RET/PTC and RAS.

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

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 withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

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.

Prophylactic central neck dissection: careful removal of all lymph nodes in the central compartment of the neck, even if no obvious cancer is apparent in these lymph nodes.

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THYROID CANCER

Patients with thyroid cancer and Hashimoto's thyroiditis have a better prognosis than those without thyroiditis

BACKGROUND

The rate of thyroid cancer is increasing, especially in women. Hashimoto's thyroiditis, the most common cause of hypothyroidism, is also common in women. Over 30% of patients who undergo surgery for thyroid cancer are found to also have Hashimoto's thyroiditis. Some prior studies have showed that thyroid cancer is less aggressive in patients with Hashimoto's thyroiditis. The aim of this study was to evaluate whether thyroid cancer patients who also have Hashimoto's thyroiditis have a better prognosis compared to thyroid cancer patients without Hashimoto's thyroiditis.

THE FULL ARTICLE TITLE:

Dvorkin S et al. Differentiated thyroid cancer is associated with less aggressive disease and better outcome in patients with coexisting Hashimoto's thyroiditis. J Clin Endocrinol Metab 2013;98:2409-14. Epub April 22, 2013.

SUMMARY OF THE STUDY

This is a study of 753 patients with thyroid cancer followed at a tertiary medical center in Tel Aviv since 1973. All study patients underwent total thyroidectomy and radioactive iodine therapy and were followed for more than one year after the initial treatment. Hashimoto's thyroiditis was present in 107 (14%) of the 753 patients. The patients in the Hashimoto's thyroiditis group were predominantly female (93% vs. 77%), had a smaller initial cancer (17.9 mm vs. 21.2 mm), had less spread of the cancer to the lymph nodes (23% vs. 34%) and had less persistent disease one year after the initial treatment (29% vs. 19%) compared to patients without Hashimotos thyroiditis. After adjusting the analysis for other potentially contributing factors, the patients with both thyroid cancer and Hashimoto's thyroiditis had a lower risk of cancer spread to the lymph-nodes at presentation and lower risk of persistent disease at the end of the follow-up period. The patients with Hashimoto's thyroiditis were also less likely to require additional radioactive iodine treatments.

The antithyroglobulin antibodies were monitored in 50 study patients who had no evidence of cancer persistence or recurrence. These antibodies disappeared after an average of 15 months (range of 2-78 months) following the thyroid surgery and radioactive iodine treatment. A total of 8 patients had persistent antibodies despite no evidence of recurrent disease.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that patients with thyroid cancer who also have Hashimoto's thyroiditis have a less aggressive form of cancer and a better long-term prognosis. A possible explanation for these findings would be that the antibodies that attack the thyroid gland in patients with Hashimoto's thyroiditis also attack the cancer. Persistence of antithyroglobulin antibodies has been associated with persistent cancer. However, this study suggest that this is not the case if the patient also has Hashimoto's thyroiditis and can, therefore, suggest a better prognosis.

— Alina Gavrila, MD, MMSC

ATA THYROID BROCHURE LINKS

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

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

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

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

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THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Thyroid cancer: this group includes papillary thyroid cancer, the most common type of thyroid cancer and follicular thyroid cancer, the second most common type of thyroid cancer.

Hashimoto's thyroiditis: the most common cause of hypothyroidism in the United States. It is an autoimmune disease caused by antibodies that attack the thyroid and destroy it.

Antibodies: proteins that are produced by the body's immune cells that attack and destroy bacteria and viruses that cause infections. Occasionally the antibodies get confused and attack the body's own tissues, causing autoimmune disease.

Antithyroglobulin 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: protein produced only by thyroid cells that can be measured in the blood.

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.

Cancer persistence: this occurs when the cancer cannot be completely destroyed after the initial treatment.

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

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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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ThyCa: Thyroid Cancer Survivors' Association, Inc.
www.thyca.org

GRAVES' DISEASE & THYROID FOUNDATION

Thyroid Cancer Canada
Cancer de la thyroïde Canada

Light of Life Foundation
checkyourneck.com

Thyroid Federation International

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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ThyCa: Thyroid Cancer Survivors' Association, Inc. www.thyca.org

GRAVES' DISEASE & THYROID FOUNDATION

Thyroid Cancer Canada
Cancer de la thyroïde Canada

Light of Life Foundation checkyourneck.com

Thyroid Federation International