Volume 19 | Issue 2 | February 2026

Clinical Thyroidology® for the Public

AMERICAN THYROID ASSOCIATION
Optimal Thyroid Health for All

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Volume 19 | Issue 2 | February 2026

Clinical Thyroidology® for the Public

www.thyroid.org

Editor
Alan P. Farwell, MD
Boston Medical Center
Boston University Chobanian & Avedisian School of Medicine
720 Harrison Ave., Boston, MA 02115
American Thyroid Association®
Email: thyroid@thyroid.org
www.thyroid.org/patients/ct/index.html

Designed by
Karen Durland, kdurland@gmail.com

Editor's Comments

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

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

February is Hypothyroidism Awareness Month.

In this issue, the studies ask the following questions:

- Can we predict who will require levothyroxine after a partial thyroidectomy/lobectomy?
- Is T3 safe for treating hypothyroidism?
- Can AI prevent unnecessary thyroid biopsies?
- Does thyroid cancer that occurs during childhood behave differently than in adults?
- Does radioactive iodine help thyroid cancer patients live longer?
- What is Nanosecond Pulse Field Ablation and is it effective to treat benign thyroid nodules?

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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THYROID SURGERY

Development of a model to predict who will need to take a thyroid hormone pill after partial removal of the thyroid gland

BACKGROUND

The thyroid gland is a butterfly shaped organ located in the front of the neck. This gland produces an important hormone, called thyroid hormone, that helps control a person's metabolism (how the body uses energy). Hypothyroidism occurs when thyroid hormone levels are low and/or TSH levels are high. Hypothyroidism is treated by a thyroid pill, usually levothyroxine.

There are a number of thyroid diseases, both cancerous and noncancerous, which are treated with surgery to remove all, or part, of the thyroid gland. If a person has their entire thyroid gland removed during surgery (total thyroidectomy), the body will no longer be able to produce thyroid hormone and the person will become hypothyroid, requiring a thyroid hormone replacement pill (levothyroxine) every day for the rest of their lives. On the other hand, sometimes only part of the thyroid gland may be removed during surgery (partial thyroidectomy or thyroid lobectomy), in which case the thyroid tissue left behind after surgery might produce enough thyroid hormone to meet the body's needs. If this is the case, levothyroxine will not be needed after surgery. Not everyone who has part of their thyroid left behind after thyroid surgery, however, will make enough thyroid hormone and such people will need to take a thyroid hormone pill. Unfortunately, it is difficult to predict if a thyroid hormone pill will be needed after partial thyroid removal for people with normal thyroid hormone levels before thyroid surgery. For this reason, the goal of this study was to develop a model to help predict which people will need to take a thyroid hormone pill after partial thyroidectomy.

THE FULL ARTICLE TITLE

Mimouni E, et al. A clinical risk score for thyroid hormone therapy after partial thyroidectomy. J Surg Res 2025;314:169-175.

SUMMARY OF THE STUDY

The study authors reviewed the medical records for all patients who underwent partial thyroidectomy at their institution between 2013 and 2020. They identified 425 patients who met study criteria. The authors then identified which of these patients were prescribed levothyroxine after surgery. The authors then re-reviewed each patient in the study group to see if there were any consistent characteristics that might predict which patients would need to take levothyroxine after surgery and which patients would not. Finally, using the identified characteristics, the authors employed statistical tools to develop a scoring system for predicting the need for a thyroid hormone pill after partial thyroid removal.

Of the 425 patients in the study, 101 (23.8%) had documented postoperative hypothyroidism based on blood testing showing low thyroid hormone levels and/or an increased TSH, and 178 (41.9%) were prescribed levothyroxine after partial thyroidectomy. The researchers identified the following characteristics as strong predictors of needing to take a thyroid hormone pill after surgery: 1) non-Black race, 2) TSH >1.59 before surgery, 3) Hashimoto's thyroiditis and 4) surgery performed to treat thyroid cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This data identifies characteristics that make it more likely that a patient will require levothyroxine replacement after a partial thyroidectomy/lobectomy. Although the model developed from this study does not perfectly predict who will need to take levothyroxine after partial thyroidectomy, it can suggest which patients might have this need. For this reason, this model might be useful in helping patients who are planning partial thyroidectomy understand what to expect after surgery.

It is important to acknowledge that there are some features of this study that limit its usefulness. Only one institution was included in the study, and the data were collected from old medical records, some of which may not be complete. This means that the results of the study may not apply to

THYROID SURGERY, continued

the broader general population, which may be different from the study group. In addition, the identification of the characteristic of "non-Black race" may actually be the result of biases related to how people of different races and/or economic backgrounds seek and receive health care, rather than a true predictor of need for thyroid hormone after partial thyroidectomy. For these reasons, further research and refinement are needed to accurately predict which patients undergoing partial thyroid removal will need a thyroid hormone pill after surgery.

As with all models related to calculating treatment risks, the model described here represents only one part of the pre-surgery discussion. These models can be used to guide or provide estimations of risk, but they all have a degree of error and every patient is unique. Before proceeding with any surgery, it is important for patients and their surgeons to have detailed conversations involving shared decisions making and clear discussions of what can be expected after surgery.

— Katelyn Larson, MD and Jason D. Prescott, MD PhD

ATA RESOURCES

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

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

Thyroid Surgery: https://www.thyroid.org/thyroid-surgery/

ABBREVIATIONS AND DEFINITIONS

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

Total thyroidectomy: surgery to remove the entire thyroid gland.

Partial thyroidectomy/lobectomy: surgery that removes only part of the thyroid gland (usually one lobe with or without the isthmus).

Levothyroxine (T4): the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tyrosint™ and generic preparations.

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.

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HYPOTHYROIDISM

How safe is T3 (Liothyronine) in the treatment of hypothyroidism?

BACKGROUND

The thyroid gland produces 2 thyroid hormones: thyroxine (T4) and triiodothyronine (T3). T4 is the main hormone secreted by the thyroid gland. T4 is converted outside of the thyroid to T3, which is the active hormone. The thyroid also secretes small amounts of T3 under normal conditions. Hypothyroidism, or underactive thyroid, is common and is typically treated with levothyroxine (L-T4) a synthetic form of T4. Most patients with hypothyroidism do fine with L-T4 alone and their symptoms are resolved. However, some patients report persistent symptoms on T4 alone even though their thyroid levels may be back in the normal range. This led to considering adding liothyronine (L-T3) to replace the small amounts of T3 that the thyroid used to secrete in combination with L-T4 in hypothyroid patients. Although the studies comparing the use of combined L-T4 and L-T3 as compared to L-T4 alone in hypothyroid patients have not shown clinically measurable differences, some patients prefer the combination therapy.

A concern with using L-T3 is that it does not last 24 hours in the blood. Also, it may not be safe for the heart and bones. This study tries to answer the question about the safety of the use of L-T3 in hypothyroid patients.

THE FULL ARTICLE TITLE

Bahl S, et al. Risk of death and adverse effects in patients on liothyronine: a multisource systematic review and meta-analysis. The Journal of Clinical Endocrinology & Metabolism, Volume 110, Issue 11, November 2025, 3278–3288, PMID: 40795305.

SUMMARY OF THE STUDY

The authors looked at 25 published studies and 27 reports of cases using L-T3 for the treatment of hypothyroidism. Among the reports, there were serious cases of thyrotoxicosis (high thyroid hormone levels) including 2 deaths. A total of 14 of those cases were due to unapproved use of L-T3 for weight loss or fatigue and 10 cases were due to dispensing errors including by compounding pharmacies. Some of the compounding errors involved dispensing as much as 1000 times the usual treatment doses of L-T3. Among the studies comparing L-T4/L-T3 with L-T4 alone, although difficult to compare due to the varied population looked at, there were no ill effects or increased risk of abnormal heart rhythms. Adverse effects of L-T3 to the bone were not studied.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study appear reassuring in that the use of L-T3 at the usual doses for the treatment of hypothyroid patients is safe. This study also points out that treatment with high amounts of L-T3, due to dispensing errors from compounding pharmacies or from off-label and unapproved uses, like weight loss and fatigue, can cause harm and should be avoided.

— Susana Ebner, MD

ATA RESOURCES

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

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

HYPOTHYROIDISM, continued

ABBREVIATIONS & DEFINITIONS

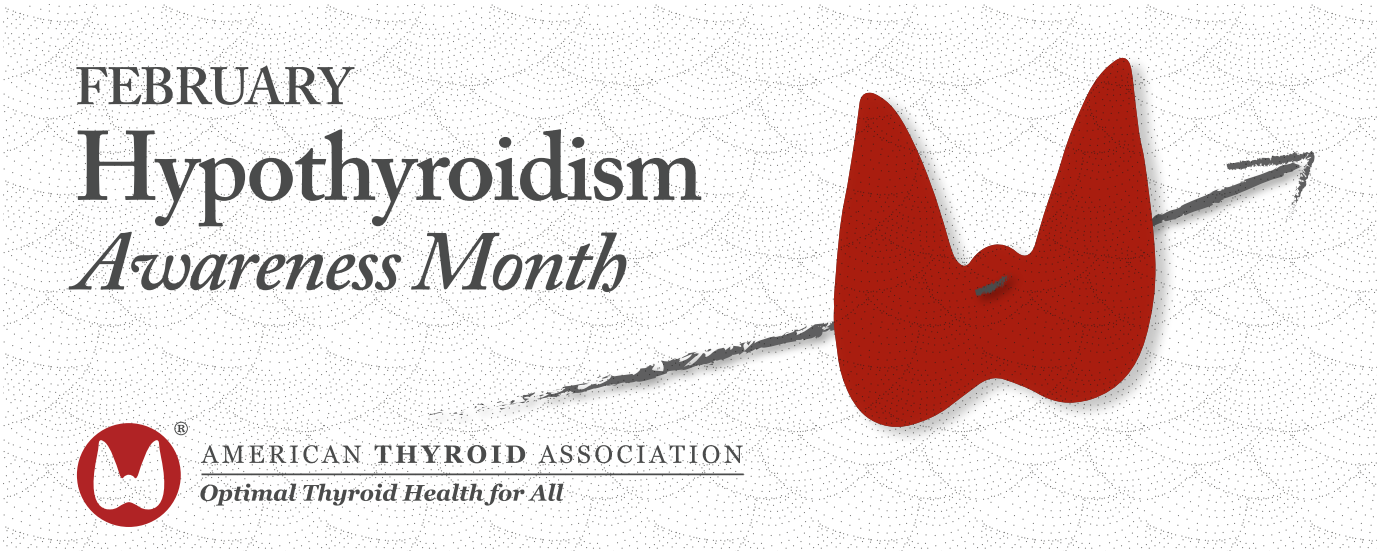
Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Levothyroxine (T4): the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tirosint™ 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.

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, available in pill form as Cytomel™.



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THYROID NODULES

The AI "goalkeeper": preventing unnecessary biopsies in the era of thyroid cancer overdiagnosis

BACKGROUND

Thyroid nodules are common, occurring in up to 50% of individuals that get any imaging of the neck. The concern about a thyroid nodule is whether the nodule contains a cancer. Many nodules are small and most types of thyroid cancer grow very slowly. Nodules are evaluated as to whether they are cancer by a thyroid biopsy. Doctors use ultrasound to decide who needs a biopsy, but this decision can be different from one doctor to another. Because doctors do not want to miss cancer, many nodules that are actually safe still get biopsied. This leads to stress, extra procedures, and higher costs.

Artificial intelligence (AI) has been used to help standardize the ultrasound characterization of thyroid nodules. In this study, researchers wanted to see if an AI computer program evaluating ultrasound images could safely reduce unnecessary biopsies.

FULL ARTICLE TITLE

Ni JH et al. Optimizing thyroid nodule management with artificial intelligence: multicenter retrospective study on reducing unnecessary fine needle aspirations. JMIR Med Inform 2025;13:e71740; doi: 10.2196/71740. PMID: 40737551.

SUMMARY OF THE STUDY

The study looked at ultrasound images from over 4,500 adults with thyroid nodules. The participants had an average age of 49.4 years and 75.3% were female. All nodules had already been recommended for biopsy by doctors. All nodules either had benign biopsy results with >12 months of stable follow-up of the nodule or had the nodule surgically removed with pathology results. A computer program reviewed the images and decided which nodules were likely benign.

The computer correctly identified most benign nodules and could have reduced unnecessary biopsies from about 70% to about 9%. The computer performed better than both junior and senior doctors. However, 123 cancers (8%) were misdiagnosed as benign, with 56.9% being papillary microcancers (small cancers <1 cm)

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that AI characterization works well as a clinical "goalkeeper," significantly outperforming radiologists and potentially preventing nearly 90% of unnecessary biopsies in the study group. Fewer unnecessary biopsies mean less pain, less worry, and fewer medical visits, while still keeping patients safe. However, the misclassification of a subset of cancers underscores that AI-benign designations should trigger ongoing ultrasound follow up, known as active surveillance, rather than clinical discharge, particularly in those with intermediate- and high-risk nodules. Overall, AI characterization of ultrasound images can help doctors make better decisions and avoid unnecessary biopsies but cannot replace medical judgment. Further studies to clarify the role of AI in ultrasound imaging are needed.

— Joanna Miragaya, MD

ATA RESOURCES

Fine Needle Aspiration Biopsy of Thyroid Nodules: https://www.thyroid.org/fna-thyroid-nodules/

Thyroid Nodules: https://www.thyroid.org/thyroid-nodules/

THYROID NODULES, continued

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 CANCER

Long-term outcomes of patients diagnosed with thyroid cancer in childhood

BACKGROUND

Thyroid cancer is common among adults. While thyroid cancer during childhood is rare, the number of patients diagnosed with thyroid cancer has increased over the last several decades. Patients in this age group tend to have larger cancers and higher likelihood that the cancer has spread beyond the thyroid gland and to other places in the body when the cancer is diagnosed as compared to thyroid cancer in adults. There are likely many factors leading to these differences, including changes related to puberty and possible different approaches to the evaluation of thyroid nodules in young patients. Despite the statistics, thyroid cancer during childhood continues to share the same excellent prognosis as in adults.

The present study sought to determine long-term outcomes of thyroid cancer in individuals diagnosed at age 20 or younger and to propose recommendations as to how best to follow these patients.

THE FULL ARTICLE TITLE

Valenciaga P et al. Long-term outcomes of patients diagnosed with differentiated thyroid cancer in childhood and young adulthood. J Clin Endocrinol Metab. Epub 2025 Sep 18:dgaf522; doi: 10.1210/clinem/dgaf522. PMID: 40973122.

SUMMARY OF THE STUDY

This study looked at a group of 155 patients with thyroid cancer that were diagnosed at the age of 20 or younger at a large Medical Center. Patients with a rare form of thyroid cancer called medullary thyroid cancer were excluded from the study. The average age at the time that the thyroid cancer was diagnosed was 17 years. More than 80% of patients were female. Most of the patients had a diagnosis of papillary thyroid cancer. About 80% of the patients had thyroid cancer limited to the thyroid. Most patients were treated with surgery and then received radioactive iodine therapy. Additional surgery was required and about 1/3rd of the patients. The average follow-up was 16 years.

Excellent response to treatment was seen in >50% of the patients. The remainder had an unclear or incomplete response to therapy. Overall, 9 patients were followed for more than 50 years. Among these patients, 2/3 of the patients had a recurrence of the cancer following a longer period of stability. A younger age and diagnosis, need for multiple surgeries or more advanced cancer at the time of diagnosis were linked to a higher risk for worse outcomes.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that patients diagnosed with thyroid cancer during childhood and adolescence have excellent long-term survival, similar to that seen in adults with thyroid cancer. The study also suggests patients diagnosed with thyroid cancer in childhood may experience recurrences many years later. This emphasizes the need for long-term follow up of patients who were diagnosed with thyroid cancer during childhood.

—Vibhavasu Sharma, MD, FACE

ATA RESOURCES

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

THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Papillary thyroid cancer: the most common type of differentiated thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

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).

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THYROID CANCER

Will a radioactive iodine treatment help me live longer with thyroid cancer?

BACKGROUND

Thyroid cancer is common but usually has an excellent prognosis and, overall, the vast majority of thyroid cancer survivors do not die of the cancer. This is because we have effective treatments, starting with surgery to remove the cancer. If there is concern that there is some cancer left, or if the cancer has spread outside the thyroid, the next step is radioactive iodine therapy. Radioactive iodine is a "magic bullet" as it is taken up and destroys only thyroid cells. In the past, when almost all patients had a total thyroidectomy, most patients were also treated with radioactive iodine therapy. We now have better information to identify patients that are low risk for the cancer to return after the initial surgery. This has led to less surgery (lobectomy, or remove only the lobe containing the cancer) and decreasing the need for radioactive iodine therapy in patients after total thyroidectomy. The newest 2025 ATA guidelines largely restrict the use of radioactive iodine to the high risk of recurrence thyroid cancer group. Using radioactive iodine therapy following total thyroidectomy for thyroid cancer patients currently is controversial for patients who are at low and intermediate risk of recurrence of the cancer.

Making conclusions about how long thyroid cancer patients live (survival) is challenging since there are few studies that look at future outcomes of patients treated in certain way from the beginning. Some studies looking at patients survival might not specify the cause of death. Using study designs with large patient databases are helpful while investigating different types of thyroid cancers and different risk of recurrence thyroid cancers.

The study was done to see if radioactive iodine therapy allowed thyroid cancer patients to live longer.

THE FULL ARTICLE TITLE

Weis H, et al. Impact of radioactive iodine treatment on long-term relative survival in patients with papillary and follicular thyroid cancer: a SEER-based study covering histologic subtypes and recurrence risk categories. J Nucl Med 2025;66:525-530.

SUMMARY OF THE STUDY

Using the SEER medical records database from 2000-2020, 101,087 adult patients with thyroid cancer were studied. The thyroid cancer patients were divided into very low or low risk depending on the cancer size, intermediate risk based on whether there was spread of the cancer to the lymph nodes in the neck, and high risk depending on if the cancer went beyond the thyroid gland or into the lungs or bones. Relative survival compares the observed thyroid cancer patient's survival to that of a cancer-free patient. The relative survivals of patients who did and did not receive radioactive iodine treatment at years 3, 5, and 10 were compared

The relative survival of most of the thyroid cancer patients was improved with radioactive iodine therapy. The greatest benefits of the radioactive iodine therapy in papillary thyroid cancers were seen when the cancer was larger, had spread to the lymph nodes, or was otherwise deemed to be a high risk of recurrence cancer. Intermediate risk of recurrence thyroid cancer patients benefitted in survival by 1-2% with radioactive iodine therapy. High risk of recurrence thyroid cancer patients benefitted in survival by over 10% with radioactive iodine. For patients with follicular thyroid cancer at high risk of recurrence, the survival benefit at 10 years was 30.9%. There was trend of survival benefit even in low risk of recurrence, minimally invasive follicular thyroid cancer patients.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that radioactive iodine therapy might help patients live longer who have different types of thyroid cancers. The biggest survival benefit of

THYROID CANCER, continued

radioactive iodine therapy was seen in patients who were diagnosed with intermediate and high risk of recurrence papillary thyroid cancers and follicular thyroid cancers, even if minimally invasive. Radioactive iodine therapy was not found to limit survival in any of the thyroid cancer patients.

Some elderly patients diagnosed with thyroid cancer might pass away from other reasons, but in previous studies the cause of death might not have been specified. This study shows that it is important to follow thyroid cancers for many years to see the survival benefit of radioactive iodine treatment.

— Pinar Smith, MD

ATA RESOURCES

Radioactive Iodine Therapy: https://www.thyroid.org/radioactive-iodine/
Thyroid Cancer (Papillary and Follicular): https://www.thyroid.org/thyroid-cancer/
Thyroid Surgery: https://www.thyroid.org/thyroid-surgery/

ABBREVIATIONS & 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 differentiated thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

Papillary microcarcinoma: a papillary thyroid cancer smaller than 1 cm in diameter.

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

Follicular variant of papillary thyroid cancer: one of the subtypes of papillary thyroid carcinoma, which has been classified to three different forms: non-invasive follicular thyroid neoplasm with papillary-like nuclear features, invasive encapsulated and infiltrative FVPTC.

Radioactive iodine: 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).

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.

Lobectomy: surgery to remove one lobe of the thyroid.

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

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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THYROID NODULES

Nanosecond Pulse Field Ablation: An emerging treatment option for benign thyroid nodules.

BACKGROUND

Thyroid nodules are common and are best characterized by neck ultrasound. Fortunately, > 90% of nodules are benign and usually don't cause symptoms and don't need any treatment. However, up to 10-15% of benign nodules can grow and lead to symptoms such as hoarseness, difficulty swallowing or breathing, neck pain, or lumps in the neck that can be seen. If a benign nodule becomes large enough, surgery may be needed.

Surgery, such as a total thyroidectomy or lobectomy, carries risks such as voice changes, permanent low calcium levels (hypoparathyroidism), neck scarring, and sometimes the need for lifelong thyroid hormone replacement. To reduce the need for surgery, several less invasive treatments like radiofrequency ablation (RFA) and microwave ablation (MVA) have been developed. These techniques use heat to destroy thyroid nodules, but the heat can damage surrounding structures and leave behind hard scar tissue, which can make the thyroid stiff and uncomfortable.

A newer technique, nanosecond pulsed field ablation (nsPFA), avoids heat altogether. It uses ultra-short electrical pulses to trigger a natural process called regulated cell death (apoptosis), similar to how normal cells die at the end of their life cycle. The body then clears these cells safely without burning or scarring. nsPFA has already been used for benign skin lesions with no serious complications. This study evaluated the safety and effectiveness of nsPFA for treating benign thyroid nodules.

THE FULL ARTICLE TITLE

Spiezia S, et al. First-in-human clinical feasibility study of ablation of benign thyroid nodules using nanosecond pulsed field ablation. Thyroid 2025;35(9):1024-1029.

SUMMARY OF THE STUDY

This early study involved 30 patients (23 women and 7 men) with benign thyroid nodules referred for consideration of surgery. The researchers divided them into three groups based on the treatment they received. In the first group of five patients, the "proof-of-concept" group, patients were treated with nsPFA under general anesthesia. Then they had a lobectomy or thyroidectomy immediately after, so the researchers could examine the thyroid tissue under a microscope. The 2nd group of 20 patients had only part of their nodules treated with nsPFA in 2-4 areas using different energy settings under local anesthesia. Ultrasound scans were done weekly for a month, then at 3, 6, and 12 months. 10 of these patients were re-treated at 12 months. The 3rd group of 5 patients had their nodules fully treated with nsPFA and ultrasound was performed monthly for a year.

When researchers examined thyroid tissue from the first group, they found that nsPFA caused cell death without heat-related damage or scarring, a positive result. Patients in the second group showed some reduction in nodule size and reported symptom relief as early as 2 weeks after treatment, with no scarring typically observed after RFA. Overall 2 patients in this group experienced temporary voice hoarseness that resolved within 24 hours. No other side effects were noted.

Patients in the third group experienced the most significant improvement. Nodule size decreased by 48% at two weeks and 71% at four weeks—a level of reduction that typically takes 6 months to achieve with RFA. After 1 year, the reduction in size reached 86%. Patients recovered rapidly from the procedure, with only minor pain, swelling, or bruising that resolved within days and no visible scarring.

THYROID NODULES, continued

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The results of this study suggest that nsPFA is a safe, effective, and minimally-invasive treatment for symptomatic benign thyroid nodules. The rapid rate of nodule shrinkage without serious side effects makes this new approach promising. However, because this was a small study, more research is needed before it becomes widely available.

— Philip Segal, MD

ATA RESOURCES

Thyroid Nodules: https://www.thyroid.org/thyroid-nodules/

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.

Nanosecond pulsed field ablation (nsPFA): a procedure where very thin needle is inserted into a thyroid nodule then uses ultra-short electrical pulses to trigger a natural process called regulated cell death (apoptosis), similar to how normal cells die at the end of their life cycle. The body then clears these cells safely without burning or scarring.

Radiofrequency ablation (RFA): a procedure where very thin needle is inserted into a thyroid nodule then uses heat to destroy the nodule.

Microwave ablation (MVA): a procedure where very thin needle is inserted into a thyroid nodule then uses heat to destroy the nodule.

Lobectomy: surgery to remove one lobe of the thyroid.

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*.

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.

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ATA® Alliance for Thyroid Patient Education

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

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GRAVES' DISEASE & THYROID FOUNDATION®

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www.thyca.org

Light of Life Foundation
checkyourneck.com

MCT8 - AHDS Foundation

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MCT8 – AHDS Foundation
mct8.info
Contact@mct8.info

Thyca: Thyroid Cancer Survivors' Association, Inc.
www.thyca.org
(Toll-free): 877-588-7904
thyca@thyca.org

Thyroid Federation International
www.thyroid-federation.org
tfi@thyroid-federation.org

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