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ROCK ON: Singer Back To Making Sweet Music After Overcoming Thyroid Cancer
Rock star Tony Harnell faced the prospect of thyroid cancer and potentially career-ending surgery head-on and came out of the experience hitting all the right notes.

Efforts to Improve Voice Outcomes After Thyroid Surgery
Surgeons are increasingly using a variety of tools to ensure optimal voice preservation for those undergoing thyroid surgery.

Kale Risks “Theoretical,” But In Reality Very Low to Miniscule
Although it has risen in popularity in recent years as a tasty and super-nutritious vegetable, kale has also taken some hits in the media for its alleged ability to cause hypothyroidism. An informative Q & A sheds some light on the controversy.

American Association of Clinical Endocrinologists Initiatives Highlight the Importance of Improved Iodine Nutrition
Recognizing the importance of pregnant women taking proper daily amounts of iodine, the American Association of Clinical Endocrinologists is advocating for increased measures to protect the health of women and children.

Healthy Eating for People with Diabetes During Winter Gatherings
The National Diabetes Education Program offers helpful tips to help you eat healthy during winter season gatherings.

A Daughter’s Efforts to Preserve Her Physician Father’s Extraordinary Legacy
Endocrinologist Dr. Saul Hertz’s pioneering discovery of radioactive iodine to treat thyroid disease is being brought to light thanks to the efforts of his daughter, Barbara.

Thyroid Awareness: Education Is Key
Of the estimated 30 million Americans suffering from some type of thyroid disorder, as many as 15 million are unaware their thyroid is not working properly. Education is key. You can learn more about thyroid conditions with these informative materials.

Hypothyroidism .......... 23-24
Hyperthyroidism .......... 25-26
The Thyroid, Pregnancy and Infancy . . . 27-28
Thyroid Self Neck Check Instructions . . . 29
EmPower, published by the American College of Endocrinology (ACE), the educational and scientific arm of the American Association of Clinical Endocrinologists (AACE), is dedicated to promoting the art and science of clinical endocrinology for the improvement of patient care and public health. Designed as an aid to patients, EmPower includes current information and opinions on subjects related to endocrine health. The information in this publication does not dictate an exclusive course of treatment or procedure to be followed and should not be construed as excluding other acceptable methods of practice. Variations taking into account the needs of the individual patient, resources, and limitations unique to the institution or type of practice may be appropriate.

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AACE is a professional medical organization with more than 6,000 members in the United States and more than 90 other countries. Founded in 1991, AACE is dedicated to the optimal care of patients with endocrine problems. AACE initiatives inform the public about endocrine disorders. AACE also conducts continuing education programs for clinical endocrinologists, physicians whose advanced, specialized training enables them to be experts in the care of endocrine diseases such as diabetes, thyroid disorders, growth hormone deficiency, osteoporosis, cholesterol disorders, hypertension and obesity.

ACE is a scientific and charitable medical organization dedicated to promoting the art and science of clinical endocrinology for the improvement of patient care and public health.
Dear Reader,

Thank you for your interest in EmPower Magazine, a patient education publication presented by the American College of Endocrinology (ACE).

ACE is pleased to present our annual thyroid health issue, which highlights our 2014 Thyroid Awareness campaign platform, The Thy Life: the vital role the thyroid gland plays in our well-being at every stage of life.

You will read about hypothyroidism and how it can impact pregnancy, the importance of iodine nutrition and related measures to protect the health of women and children, physician efforts to preserve the integrity of the voices of thyroid surgery patients, and the compelling story of a world-class rock singer who survived intensive thyroid cancer treatment with his vocal prowess intact.

This edition of the magazine also sorts fact from fiction about kale and its impact on thyroid health and offers a special section of education materials about a variety of thyroid-related conditions.

And we share the story of Barbara Hertz and her efforts to preserve the legacy of her father, Dr. Saul Hertz. Dr. Hertz was an endocrinologist whose revolutionary research established radioactive iodine as a treatment for patients with Graves’ disease. His work in the 1930s and 1940s continues to benefit countless numbers of patients and paved the way for significant advancements in the nuclear medicine field.

EmPower Magazine is just one of many patient education tools created by ACE in conjunction with the American Association of Clinical Endocrinologists (AACE). You can read past issues of the magazine and learn more about endocrine health on our website at: www.EmPowerYourHealth.org or visit www.thyroidawareness.com to learn more about the thyroid.

We trust that something in this issue will either help you to improve your own health or the well-being of someone close to you.

Sincerely,

JEFFREY R. GARBER, MD, FACP, FACE
Guest Editor
From a few short weeks following conception through infancy, into childhood and adolescence, during adulthood and throughout the golden years...it is the "engine" in our bodies that powers everything from body temperature, digestion, metabolism, muscle strength, skeletal growth and sexual development to the health of the heart, brain, kidneys and liver.

It’s all about embracing the Thy Life: how maintaining optimal thyroid health throughout our lifetime is crucial to overall well-being.

The Basics

To understand the role the thyroid gland fulfills when functioning properly, it’s best to start with the basics: The thyroid is a butterfly-shaped gland typically weighing less than an ounce that is located in the front of the neck just below the Adam’s apple. It is wrapped around the trachea (windpipe), and its purpose is to produce, store and release into the bloodstream hormones that regulate, or in some way participate in the process of, a wide range of crucial bodily functions.

For such a tiny gland, that’s a lot of responsibility. So how does the thyroid work its complex metabolic magic?
The process begins when the pituitary gland, the so-called “master gland” located at the base of the brain, produces thyroid-stimulating hormone (TSH), which acts upon the thyroid gland to produce two vital hormones, thyroxine [thigh-rahk-sun] (T4) and triiodothyronine [try-eye-oh-doe-THY-ruh-neen] (T3), that influence virtually every cell in your body. Production of T3 and T4 occurs when iodine, introduced to the body via food, is synthesized. Although the thyroid produces much more T4 than T3, the T4 serves as the source of most T3, the form of thyroid hormone that actually enters the body’s cells to maintain metabolic function by converting food into energy and heat.

If the amount of thyroid hormone in the body is too low, the pituitary senses it and releases TSH, which signals the thyroid to produce more. Once the thyroid produces enough hormone for the body’s needs, the pituitary slows down its production of TSH back to normal.

The thyroid also produces calcitonin [kal-si-toe-nin], a substance which regulates the body’s calcium levels by promoting absorption of calcium into the bones. While the importance of calcium in providing strong bones and teeth is well known, it also plays an essential role in brain function. When a chemical signal arrives at a brain cell, it’s the job of calcium to deliver that signal from the outside of the cell to the inside.

IN THE WOMB: THE THYROID AND FETAL DEVELOPMENT

Interestingly enough, the thyroid gland is the first of the body’s endocrine system glands to develop, which begins to take place approximately 24 days after conception. Human fetuses acquire the ability to synthesize thyroid hormones at roughly 12 weeks of gestation. However, the fetus remains dependent on the mother for the ingestion of iodine essential to make the thyroid hormones needed for normal brain development, as well as for many other aspects of a healthy pregnancy and fetal growth. In fact, research has shown that even mild hypothyroidism [hi-po-thigh-roy-dih-zum]—a deficiency of thyroid hormone—in a pregnant woman can result in decreased IQ or mental retardation in the child and can lead to a number of complications, including stunted growth in the baby, maternal hypertension, miscarriage and preterm delivery (see related articles on pages 12 and 16). Thus, it is extremely important for the mother-to-be to take in enough iodine to enable the thyroid gland to make enough hormone for both herself and the developing fetus.

Once a full-term baby is delivered, there is an abrupt rise in the baby’s TSH within 30 minutes of delivery, although the newborn continues to be protected by its mother’s thyroid hormone for a few weeks after birth. However, it is not unusual for some babies (1 out of 4,000) to suffer from what is known as congenital hypothyroidism, or an underfunctioning thyroid, which occurs because of the failure of the thyroid to develop, the inability to produce hormone normally, or iodine deficiency. If untreated for several months after birth, severe congenital hypothyroidism can lead to growth failure and permanent intellectual disability. Consequently, state-mandated programs that began in the 1970s now routinely test the blood of all newborns for evidence of thyroid dysfunction, as well as other metabolic diseases.

THYROID DISEASE AND PUBERTY

Thyroid disease can be damaging at any stage of life. At puberty, the thyroid starts to produce more thyroid hormone, which is needed for the rapid growth and sexual development that occurs during adolescence. Thus, a low-functioning thyroid at this stage of life can delay puberty, delay development of adult teeth and wreak havoc with a teen’s reproductive function. For instance, girls with thyroid problems may have an abnormally early or late onset of puberty and menstruation, a decrease or increase in menstrual flow, or there may be a shorter or longer time between periods than usual.

Although thyroid complications among teenagers are unusual, they can cause marked physical and mental health complications when they do occur, and many signs of thyroid problems are not that dissimilar to common body changes experiences as a teen. So, if you suspect your child might have a thyroid problem, it’s wise to seek the services of a pediatric endocrinologist, a physician who specializes in diseases of endocrine organs such as the thyroid, pituitary, adrenal and pancreas.

THYROID DISEASE IN OLDER ADULTS

Although thyroid problems are common in those over 60, in this age group its features can be subtle and few in number. Symptoms are often attributed to aging, presumed to be medication side effects or caused by cardiovascular, gastrointestinal, or nervous system diseases. This can make it very difficult to suspect that a thyroid problem is present. Seniors especially should become familiar with the symptoms and body changes of thyroid disease. Doing so can lead to prompt diagnosis and treatment—the key to preventing the short- and long-term complications of thyroid disease and increasing the chances for having truly golden years.

(Continued on page 6)
WHAT CAUSES THYROID PROBLEMS?

Diseases of the thyroid can occur at any stage in life and are primarily classified into problems involving a.) the function of the thyroid gland (either overactive or underactive) or b.) the structure of the thyroid gland (changes in size or the development of nodules). Structural problems can include an enlarged thyroid gland (also known as a goiter [goy-ter]), a small thyroid gland (atrophic) or the development of either single nodules (solitary thyroid nodule) or multiple thyroid nodules (multinodular gland). Functional problems of the thyroid are initially evaluated with blood tests which are used to determine if the thyroid is functioning normally, or is overactive or underactive. The evaluation of structural problems of the thyroid is usually done with a thyroid ultrasound. Because a thyroid gland can often have both a structural problem and a functional problem simultaneously, the proper evaluation of a thyroid condition includes careful examination of both the structure and function of the thyroid gland.

TOO LITTLE THYROID HORMONE

Among the more common thyroid conditions is hypothyroidism (mentioned above), which can occur as a result of iodine deficiency; an autoimmune disorder, such as Hashimoto’s thyroiditis [hah-she-moe-toes thy-roy-dye-tiss], where the body attacks the thyroid gland as if it were foreign tissue; surgical removal of the thyroid to treat severe hyperthyroidism or thyroid cancer; and radiation therapy for treatment of cancers in the region of the head and neck.

Typical symptoms of hypothyroidism are abnormal weight gain, fatigue, hair loss, intolerance to cold, impaired memory (“brain fog”), constipation and a slow heart rate. Hypothyroidism is typically treated with a daily dosage of a synthetic hormone replacement drug, such as levothyroxine, which is usually required for the rest of the patient’s life.

Hypothyroidism affects women more than men and is especially common in females older than age 60.
However, infants, children, teens and adults of all ages can also develop the condition.

**TOO MUCH THYROID HORMONE**

When your thyroid gland is overactive, the result is a condition called hyperthyroidism [hi-per-thigh-roy-dih-zum], which increases a person’s metabolic rate. Hyperthyroidism is the result of overproduction of T3 and T4 by the body and is most commonly caused by Graves’ disease, in which the body produces antibodies that stimulate the thyroid to secrete excessive quantities of thyroid hormones. It can also be caused by a toxic multinodular goiter, a condition that occurs when a hyperfunctioning nodule develops within a longstanding goiter (abnormal enlargement of the thyroid gland).

Symptoms of hyperthyroidism can include prominent eyes, heart palpitations, excessive sweating, weight loss, diarrhea, muscle weakness and a heightened sensitivity to heat. (NOTE: While Graves’ causes protruding eyes, hyperthyroidism of all types causes wide-open eyes, which create the illusion of protrusion). Approximately 15 percent of all patients diagnosed with hyperthyroidism are over the age of 60.

There are several options for treating hyperthyroidism. Anti-thyroid medications are often used to slow down the production of thyroid hormones. Alternatively, the gland may be partially or entirely removed surgically or radioactive iodine may be given. If the entire thyroid gland is removed, and usually after taking radioactive iodine, patients become hypothyroid and must remain on thyroid medication for life.

**THYROID GROWTHS**

Thyroid nodules—a collection of cells within the thyroid that grow and produce a lump—are relatively common and sometimes are discovered by physical examination of the thyroid gland, but often are detected incidentally during a radiology test such as an ultrasound or CT scan being performed for an unrelated reason. People can develop thyroid nodules at any age, but they occur most commonly in older adults. Thyroid nodules are more common in women than in men.

Fortunately, 90 to 95 percent of thyroid nodules are benign (not cancerous). Several features do make it more likely for a thyroid nodule to be cancerous: a rapid increase in the size of the nodule, difficulty swallowing, changes in the voice, difficulty breathing, a family history of thyroid cancer, or prior history of radiation exposure during childhood.

The type of cancer determines the treatment plan and the prognosis. With the less aggressive forms of thyroid cancer, treatment typically is surgery to remove the cancerous nodule (and any enlarged lymph nodes) from your neck. This is sometimes followed several weeks later by the administration of radioactive iodine to destroy any remaining thyroid tissue in the body. After surgical removal of the thyroid gland, patients must take synthetic thyroid hormone daily for the rest of their lives.

Until recently, patients had to temporarily stop their thyroid hormone therapy to receive radioactive iodine (RAI) treatment or undergo monitoring tests for possible cancer recurrence. This was to allow the patient’s thyroid-stimulating hormone (TSH) level to rise and stimulate cancer cells to absorb iodine. Thanks to development of a synthetic product called recombinant human TSH, today’s thyroid cancer patients can undergo RAI and monitoring using recombinant human TSH without temporarily discontinuing their thyroid hormone therapy.

Patients whose thyroid nodule has been identified by a primary care physician are often referred to an endocrinologist for further evaluation or are referred directly to surgeons who specialize in thyroid surgery.

You can perform a simple Neck Check self-exam to help assist with finding nodules or enlargements in the neck that may point to a thyroid condition. A step-by-step guide is offered online at: [http://thyroidawareness.com/neck-check](http://thyroidawareness.com/neck-check).

Surprisingly, thyroid disease is more common than diabetes or heart disease and is a fact of life for as many as 30 million Americans. Women are at greater risk than men, and being 50 or older poses the highest risk of developing a thyroid condition. Also surprising are estimates suggesting that more than half of those with thyroid disease remain undiagnosed. For that reason, the American Association of Clinical Endocrinologists (AACE) and the American College of Endocrinology (ACE) are promoting thyroid awareness through The Thy Life educational campaign, with a mission to enlighten people at all stages of life about how maintaining good thyroid health is vital to a healthy life. For additional information about The Thy Life, visit [www.thyroidawareness.com](http://www.thyroidawareness.com).
ROCK ON: Singer Back To Making Sweet Music After Overcoming Thyroid Cancer

"You have cancer"....they are among the most devastating three words a person can hear.

In the case of Tony Harnell, being told in January 2009 that the bothersome area in his neck was, in fact, thyroid cancer was doubly frightening.

A vocalist with a four-octave range, Harnell has entertained legions of fans worldwide as frontman for Norwegian heavy metal band TNT and toured the U.S. with the likes of legendary rockers STRYPER, Twisted Sister and Great White. But with his 2009 diagnosis, he not only faced a delicate procedure to remove

BY MARY GREEN

Singer Tony Harnell.
cancerous thyroid tumors from his neck, he was also wrestling with the thought that the potentially life-saving procedure might also end his career due to the thyroid’s location near nerves that affect the way delicate muscles and tendons are used in singing.

Harrell’s career as a singer/songwriter was inspired in large part by his music-loving family, particularly mother Constance, who was a soprano with the San Francisco Opera and New York City Opera troupes. “I really started singing when I was five,” Harnell recalls. “There was always music in our house and I was just completely enchanted with music, plus my mother and aunt were both exposing me to a constant inflow of classical, pop and rock music.”

It was the powerful, operatic style of singers like Black Sabbath’s Ronnie James Dio, Judas Priest lead vocalist Rob Halford and Queen frontman Freddie Mercury that most inspired Harnell, and at 15, he joined his first garage band. He spent the next three years honing his skills and, at 18, began studying under world-renowned vocal coach Don Lawrence with the goal of landing a record deal by the age of 21. While performing in New York City with local band The Jackals, two industry music representatives approached Harnell about joining TNT. A week later he was on a plane to Norway to lay down tracks for TNT’s third album, and less than two months later the band was signing a deal with Mercury/Polygram. Worldwide acclaim followed. “It was incredible for us as a band and a natural merging of what I was into, because what I was good at singing was the type of music the labels wanted to sign and what people wanted to hear,” Harnell says.

In 2001, Harnell thought he detected a small growth in his neck but ignored it until four years later when, while on tour, he started experiencing neck pain that intensified whenever he performed. “The more I would sing, the harder I would sing, the more it would bother me,” he notes. Although the discomfort continued, he powered through it for several more years until he felt a nodule not only in the center of his neck, but also on the right side. A new physician finally recommended an ultrasound, then a biopsy two weeks later based on the ultrasound results. The unsettling news: it was papillary [pap-i-lar-ee] carcinoma, which is the most common type of thyroid cancer diagnosed in the U.S.

Harnell underwent a total thyroidectomy [thi-roy-dek-to-me] procedure, in which his surgeon removed the complete thyroid—which had two large, cancerous nodules—and adjacent lymph nodes that were also affected. Several weeks later he underwent radioactive iodine therapy to destroy any remaining thyroid tissue in his body and was placed on thyroid hormone replacement medication to keep his body’s metabolism balanced, which he will need to take for the rest of his life. Because of Harnell’s occupation and the extensive surgery performed, he also opted to undergo physical therapy to rehabilitate his vocal cords and other muscles affected by the surgery and subsequent scar tissue.

He made it through his experience with his voice intact and is back to hitting all the high notes in his music...with a unexpected benefit from the ordeal. “One thing that’s different is that while I still have all of my vocal range, I have a richer, darker tone to my voice, which I’ve always wanted,” Harnell said. “I’ve been great ever since.”

(Continued on page 10)
Tony Harnell’s story is just one among many: thyroid cancer diagnoses have more than doubled since 1990, one of the few cancers that has increased in incidence in recent years. The good news is that thyroid cancer is an extremely treatable disease when caught in its early stages during a neck examination. To assist those who are interested in how to perform a self neck-check or more information on thyroid cancer or other thyroid-related conditions, the American Association of Clinical Endocrinologists (AACE) has created a dedicated website: www.thyroidawareness.com.

Efforts to Improve Voice Outcomes After Thyroid Surgery

BY GREGORY W. RANDOLPH, MD, FACS, FACE

The story of Tony Harnell is a poignant example of the importance of voice preservation in patients undergoing thyroid cancer treatment. For many years surgeons have been aware of how important their patients’ voices are and the tragedy of losing or altering it when thyroid surgery causes injury to the recurrent laryngeal [la-rin-je-al] nerve (RLN) or superior laryngeal nerve (SLN). The recurrent laryngeal nerve is responsible for supplying sensation to the main area which generates our voice—the larynx (voice box)—while the superior laryngeal nerve stimulates the cricothyroid [kri-ko-thi-royd] muscle, which is vitally important in stretching the vocal cord folds and maintaining pitch.

This plight has been illustrated historically through the story of legendary 20th century Italian opera singer Amelita Galli Curci. The coloratura soprano’s career was reportedly lost after the injury of the external branch of the superior laryngeal nerve during her surgery under local anesthesia that altered her ability to sing high pitches. It was said of her in the press at the time, “The surprising voice is gone forever; the sad specter of a ghost replaces the velvet softness.”

The recent work of the American Academy of Otolaryngology-Head and Neck Surgery Foundation (AAO-HNSF) to develop guidelines for the best voice outcomes in adult patients undergoing thyroidectomy [thi-roy-dek-to-me], the surgical removal of all or part of the thyroid gland, indicates that there are numerous nerve and non-nerve factors that can affect the voice. Vocal cord paralysis may occur immediately following thyroid surgery in up to 10 percent of patients and can be sufficient enough to warrant a change in vocation.

There has been increasing recognition of the importance of laryngeal exam at the time of thyroidectomy. The AAO and the American Head and Neck Society recommend doing laryngoscopy [lar-ing-gos-ko-pe], a procedure in which the physician uses a scope to visually examine the back of the throat, the voice box and vocal cords prior to and following thyroid surgery. Highly sensitive nerve monitoring which identifies the recurrent laryngeal nerve and external branch of the superior laryngeal nerve in an effort to preserve the nerves’ functional integrity is increasingly being used by the most experienced thyroid surgeons. All of these recommendations and advancements highlight the increasingly widespread recognition that the larynx and voice are at the center of the thyroid surgical field, epitomized by the story of Tony Harnell.
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Hypothyroidism and Pregnancy

BY ALEX STAGNARO-GREEN, MD, MHPE

Many women who become pregnant are on thyroid hormone replacement. The most common reason that a woman of childbearing age is on thyroid hormone is due to a disease called Hashimoto’s [ha-SHI-mo-toz] thyroiditis [the-eye-royд-EYET-uhss], a condition where the body’s own immune system becomes confused and destroys the thyroid. Other reasons why women are on thyroid hormone include the need to replace the hormone following surgery (for thyroid cancer or thyroid nodules) or following destruction of the gland by radioiodine treatment (for an overactive thyroid condition called Graves’ disease).

No matter the reason a pregnant woman is on thyroid hormone, it is critical that she be on the correct dose of medicine both prior to and throughout her pregnancy. Studies over the last 20 years have shown that it is important, for the health of the fetus and the mother, that the pregnant woman have normal thyroid function throughout the entire pregnancy. According to the studies, pregnant women who do not receive enough thyroid hormone are more likely to have a number of complications including maternal hypertension, miscarriage, preterm delivery and decreased IQ in their child.

Maintaining a normal state of thyroid function during pregnancy requires careful attention by both the physician and mother-to-be, as dramatic changes occur in the thyroid during this time. During pregnancy, in a woman who has no thyroid disease, the thyroid gland needs to dramatically increase the amount of thyroid hormone that is made. Specifically, the thyroid gland has to produce 50 percent more thyroid hormone. There are many reasons why this is the case, including the fact that the mother is producing thyroid hormone both for herself and for the developing baby. Women who have a thyroid gland that functions normally have no difficulty in producing the extra hormone needed for the unborn child, although it is important that all pregnant women take a prenatal vitamin with a sufficient amount of iodine, as iodine is necessary for the thyroid gland to produce thyroid hormone. Not all prenatal vitamins contain iodine, so be sure to check labels properly.

However, the situation is completely different in women who are on thyroid hormone prior to pregnancy. In these individuals, since the thyroid gland is no longer functioning (due to Hashimoto’s thyroiditis, surgery or radioactive iodine treatment) the thyroid cannot respond to pregnancy by producing more hormone. The majority of these women will develop an underactive thyroid—called hypothyroidism [hi-po-thiroyd-ism]—once they become pregnant which, as discussed, may have a negative impact on the both the developing baby and the mother. In fact, studies have shown that approximately two-thirds of all women on thyroid hormone replacement will develop some degree of hypothyroidism during pregnancy if appropriate steps are not taken.

So, what needs to be done? The most important step is to talk with your physician about your thyroid condition prior to becoming pregnant. Frequently, your physician will increase the dose of thyroid hormone even prior to you attempting to conceive. Secondly, you should contact your physician as soon as you confirm that you are pregnant. At that point, your doctor will either have you increase the dose of your thyroid medicine or have you come in immediately for a blood test. Frequent monitoring of your thyroid status, especially during the first half of pregnancy, will also be needed to ensure that your thyroid function remains in the normal range of pregnancy.

With appropriate planning, working closely with your physician prior to pregnancy and ongoing communication between you and your physician throughout the pregnancy, you can optimize your thyroid health and that of your unborn child.
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Kale Risks “Theoretical,” But In Reality Very Low To Minuscule

BY RACHEL ZIMMERMAN

On January 1st, The New York Times published an opinion piece titled “Kale? Juicing? Trouble Ahead.” In the piece, a self-described “health nut” wrote a cautionary tale about her surprising discovery of a potential downside to eating large amounts of kale and other cruciferous vegetables: they may inhibit absorption of iodine and thus promote development of a goiter (enlargement of the thyroid gland) or slow down the thyroid’s function, ultimately causing a condition called hypothyroidism.

Here we present an informative follow-up article created by health and medicine journalist Rachel Zimmerman with Dr. Jeffrey R. Garber, our EmPower Magazine guest editor, as part of her co-hosting duties for Boston NPR station WBUR’s CommonHealth blog.

Editor’s Note: Ms. Zimmerman’s article and interview were first published on WBUR’s CommonHealth blog at: http://commonhealth.wbur.org/2014/01/the-dark-side-of-kale-and-how-to-eat-around-it.

My blog post—“The Dark Side of Kale (And How To Eat Around It)”—went wildly viral this week, generating huge traffic and high passions over this once minor but now hotter-than-hot vegetable. Among the accusations from readers were charges that the post was “dubious and dangerous” and that I was, in effect, “discouraging Americans from eating vegetables” (my children would disagree).

Still, for a medical reality check, I turned to a doctor who specializes in treating the thyroid.

Bottom line: in the U.S, where we don’t have a big problem with iodine deficiency, it’s probably OK.

OK, back to the thyroid expert, who points out that this debate is particularly timely since January is Thyroid Awareness Month.

Dr. Jeffrey Garber is chief of endocrinology at Harvard Vanguard Medical Associates and lead author of the latest clinical practice guidelines on hypothyroidism in adults. He agreed to answer a few more questions on the kale-thyroid connection.
I’d sum up Dr. Garber’s take on the whole kale issue pretty simply: It’s probably unwise to embrace a long-term, pound-a-day raw kale habit, but even if you do, you will, in all likelihood, be fine. (Especially if you live in the U.S., where iodine deficiency isn’t a huge problem and if you don’t have a family history or predisposition to thyroid disorders.) (Editor’s Note: Cooked kale cannot interfere with the way the thyroid works).

“If one isn’t a food faddist or predisposed to a thyroid problem (family history, prior diagnosis) the risks are very low,” Garber said. And, he adds, if you have any concerns at all, check in with your doctor for a simple thyroid test.

Here, lightly edited, is our Q&A:

RZ: In plain terms, what’s the connection between kale, a cruciferous vegetable, and thyroid function?

JG: There are many substances that can interfere with the way the thyroid functions. Goitrogens, as in those that promote goiter, make up one of these categories.

(There’s an enormous amount of interest in environmental goitrogens, like BPA and other substances, but that’s another story: We’re talking about dietary goitrogens here.)

When you get into the way goitrogens can affect the thyroid directly, there are three general ways (and all relate to iodine, which is what thyroid hormone is made from):

1. the way the thyroid picks up the iodine;
2. the way the thyroid produces the hormone once the iodine is in the thyroid;
3. the way thyroid hormone is secreted into the bloodstream.

When you look at dietary goitrogens, they interfere with one or more of these three steps.

RZ: OK, so kale is one of these so-called “goitrogenic” foods, right?

JG: Yes. And [quoting from a section in the textbook The Thyroid, written by Michael B. Zimmerman, MSc, MD, Professor of Health Sciences and Technology at ETH Zurich in Switzerland] other cruciferous vegetables implicated as goitrogens include: cabbage, cauliflower, broccoli, turnips, rapeseeds — they contain something called glucosinolates, their metabolites compete with iodine for thyroidal update. Similarly, cassava, lima beans, linseed, sorghum and sweet potato contain cyanogenic glucosides; these may be metabolized to thiocyanates that compete with iodine for thyroidal uptake. Also, if you don’t have enough iodine, deficiencies in selenium, iron and vitamin A can make you even more vulnerable to developing an underactive thyroid.

[An aside]: Iodine deficiency isn’t generally a problem in this country. It’s hard to avoid iodine in the diet here: many breads, dairy and salt (except for “designer” salts, kosher salt and sea salt) contain iodine. But in poor, developing countries about one billion people have an iodine deficiency that can cause an underactive thyroid and endemic goiter.

RZ: So, what’s the bottom line here? Green smoothies everyday or not?

JG: Basically the goitrogens are challenges to the thyroid. But in the absence of iodine deficiency, substantial or prolonged ingestion of dietary goitrogens and lastly, the absence of an underlying thyroid disorder, the risk in this country of having problems in this area are very, very low, almost minuscule. Again, that’s because the vast majority of people have adequate iodine levels to counteract the effect of goitrogens.

RZ: So, the writer of The New York Times opinion piece, Jennifer Berman, said she stopped consuming kale juice daily after she was diagnosed with hypothyroidism; when she looked up foods to avoid, kale was at the top of the list.

JG: She gave herself too much credit for what happened to her.

RZ: But if you actually drank a green smoothie with raw kale every day for a long period of time and somehow managed to be iodine deficient, could you do this to yourself?

JG: It could theoretically happen, but it would be unusual.

RZ: I’m still kind of confused by all of the information out there. If I Google “Hypothyroidism And Foods To Avoid,” several sites have some variation on the advice Berman got: steer clear of kale.

JG: I think it’s overplayed.

RZ: And what about children? It’s hard enough to get them to eat veggies at all.

JG: My strong personal opinion is to follow standard, conventional nutritional advice for kids.

We should end here by stating the obvious: vegetables are, in general, fabulous for your health; and any kind of obsessive, extreme diet that includes massive consumption of a single food can, in general, lead to trouble.
Iodine is a critical micronutrient found in the diet that is needed in sufficient quantities not only to ensure optimal health, but also to make thyroid hormone, which is vital for normal brain development: low iodine intake in pregnant women can lead to brain damage in their children. Iodine deficiency affects 1.92 billion people worldwide and is the leading preventable cause of mental retardation.

Pregnant women need to increase their iodine intake. Women who are breastfeeding also need higher iodine intake, since iodine is transported into breast milk, where it is important for infant nutrition. Pregnant women need 220 micrograms iodine every day. Breastfeeding mothers need 290 micrograms daily. These levels are higher than the 150 micrograms daily recommended for most adults.

Most people in the United States get enough iodine in their diets. However, studies over the last decade have shown that iodine intake is low in pregnant women. Although urine measurements can be used to estimate the iodine status of large groups, there is currently no test that can tell whether an individual person is getting enough iodine.

SOURCES OF IODINE

Although dairy foods are currently an important source of iodine in the U.S., most sources of iodine in foods can be hard to identify. Iodine is not listed on package labels in the U.S., and typical iodine amounts in foods are quite variable. While adding iodine to salt has been the mainstay of global efforts to improve iodine nutrition, salt iodization has never been required in the U.S. Most U.S. commercial food processors do not use iodized salt. And although iodine is especially important in pregnancy, only half of the prenatal vitamin brands sold in the US contain iodine.

AACE/ACE RECOMMENDATIONS

AACE/ACE recommend that all U.S. women who are pregnant, breastfeeding or planning a pregnancy should take a daily multivitamin containing 150 micrograms of iodine. Ideally, all prenatal vitamins sold in the U.S. should contain iodine.

PETITION TO THE DIETARY GUIDELINES FOR AMERICANS COMMITTEE

To that end, AACE/ACE recently teamed with the American Thyroid Association, the Endocrine Society, the International Council for the Control of Iodine Deficiency Disorders Global Network, and the Teratology Society to offer suggestions to the Dietary Guidelines for Americans committee, which provides the basis for all federal food and nutrition policy and education initiatives. These guidelines are updated by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services every five years. The next update is due in 2015.

The current guidelines do not mention iodine. The societies recommended that pregnant women and women of childbearing age should eat a varied diet rich in iodine-containing foods, such as fish and milk, and should choose iodized salt over non-iodized salt. The collective groups also recommended that women who are pregnant, breastfeeding or planning a pregnancy should take a daily prenatal vitamin that contains 150 micrograms of iodine.

The New England Chapter of AACE has recently taken this initiative a step further by calling for the help of local health insurers, asking them to pay only for prenatal vitamins that include 150 micrograms of iodine daily. AACE/ACE believe that insurance policies encouraging the use of iodine-containing vitamins could help to protect the health of women and children.

AACE/ACE are working nationally and regionally to make sure that women and their babies are getting the iodine they need for thyroid health and brain development. ☁
Healthy Eating for People with Diabetes During Winter Gatherings

BY THE NATIONAL DIABETES EDUCATION PROGRAM

Winter is a season of celebrations, football playoffs, and other occasions when family and friends get together over meals and snacks. For people with type 2 diabetes, it can be a challenge to stick to a meal plan. Mouth-watering options such as honey-baked ham, buttery mashed potatoes and sweetened yams are popular for festive dinners, while chicken wings, cheesy nachos and chips are among the favorites at football playoffs and other gatherings. However, you don’t have to completely avoid all of your favorite foods. The key is to make a variety of healthy food choices and limit portion sizes.

Follow these tips from the National Diabetes Education Program (NDEP) to help you eat healthy during gatherings throughout the winter season:

• **Eat a healthy snack.** Eat a healthy snack before leaving home to prevent overeating at the party.

• **Plan ahead.** Check out the party food options before you begin eating, and make a mental note of what and how much you will eat.

• **Bring a healthy dish.** Bring a dish that fits into your meal plan and you can share with others.

• **Move away from the buffet.** Fix your plate, and then step away from a table of finger foods to avoid grazing while chatting.

• **Savor the flavor.** Eat slowly to reduce your chances of overeating.

• **Drink water.** Water is a healthy, no-calorie beverage. Drink plenty of it.

• **Trim it down.** Eat smaller portions of food. Trim off extra skin and fat from meat.

• **Enjoy the party.** Focus on family, friends, and activities rather than food. Stay active by participating in games or dancing.

Follow these tips if your goal is to serve healthy feasts to your guests:

• **Bake it. Broil it. Grill it.** Keep meat low in fat by cooking without frying. Trim beef and pork of visible fat and choose skinless poultry.

• **Increase fiber.** Serve whole grain breads, vegetables, peas, and beans as part of your meals.

• **Easy on the toppings.** Lighten your recipes by using reduced-fat or fat-free mayonnaise, butter, sour cream, or salad dressing.

• **Focus on fruits.** Serve fresh or canned fruit in water instead of ice cream, cake, or pie.

• **Serve low-calorie beverages.** Offer your guests water instead of juice or regular soda.

• **Family support is key.** Support your family and friends by encouraging them to eat healthy during the winter months and throughout the year.

For more information about managing diabetes, contact the National Diabetes Education Program at 1-888-693-NDEP (1-888-693-6337), TTY: 1-866-569-1162 or visit YourDiabetesInfo.org to order your copy of 4 Steps to Manage Your Diabetes for Life.

The U.S. Department of Health and Human Services’ National Diabetes Education Program is jointly sponsored by the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) with the support of more than 200 partner organizations.
What do you call kids who don’t let type 1 diabetes stand between them and their dreams? At Lilly, we call them every day heroes.

It takes a special type of kid to handle the rigors of high school, manage the daily demands of type 1 diabetes, and grow into great young adults. That’s why at Lilly, we’re proud to support the Diabetes Scholars Foundation, offering scholarships to help them pay for college.

To learn more about these scholarships, visit diabetesscholars.org/Lilly. And take this page to discuss with your healthcare provider. For more information about all the helpful programs Lilly offers families with type 1 diabetes, visit lillydiabetes.com.
In 1936, clinical research into the potential of nuclear medicine—a medical specialty involving the application of radioactive substances in the diagnosis and treatment of disease—was in its infancy. That year, endocrinologist Dr. Saul Hertz attended a lecture in which Massachusetts Institute of Technology president Dr. Karl Compton urged physicians to seek out applications of physics in medicine and biology. Intrigued and inspired by Dr. Compton’s call to action, Dr. Hertz posed a simple question to Dr. Compton: “Could iodine be made artificially radioactive?”

Thus the seeds were planted for research that culminated in one of the most profound and enduring of medical discoveries: the successful use of radioiodine in the treatment of Graves’ disease (hyperthyroidism) and as the first targeted cure for cancer, specifically thyroid cancer (because the thyroid absorbs iodine, the radioactivity is also absorbed, destroying the cancer cells while leaving all other cells in the body unharmed).

There’s no doubt that Dr. Hertz’s revolutionary work not only changed the treatment of thyroid disease forever and saved countless lives worldwide, but also paved the way for significant advancements in the nuclear medicine field. Sadly, Dr. Hertz died of a heart attack in 1950 at the age of 45. Here his youngest daughter, Barbara, shares her memories of his historic achievements and what she is doing to preserve his extraordinary legacy.

What are your early memories of your dad?
The first memory I have of my dad is from a picture that hung on my bedroom wall. He had died suddenly of a heart attack when I was three. In the photo, he looked elegant in formal tails and happy next to my beautiful mom in her rented wedding gown. They stood by the fireplace in our Grove Street home in Brookline, a suburb of Boston. As a youngster, I would not have recognized the Phi Beta Kappa Key he wore that day. It was not until much later that I learned of its significance as well as his important contribution to medicine. I grew up hearing my dad had discovered radioactive iodine (RAI) as a treatment for a disease, but had little information beyond that.

(Continued on page 20)
A Daughter’s Efforts To Preserve Her Physician Father’s Extraordinary Legacy

(Continued from page 19)

How did you come to learn about his contribution to medicine?

While cleaning out my childhood home I discovered boxes and boxes of my dad’s papers that were safely stored in the attic. My mother had thrown out very little in the nearly 60 years she had lived there. What a treasure of correspondence, original journal drafts, newspaper articles and, to my amazement, the data charts of the very first series of patients treated with radioactive iodine!

Over time, and with the help of medical historians, archivists and prominent thyroid specialists, the story unfolded. I found the letter that MIT’s President Compton sent responding to my dad’s spontaneously asked seminal question posed in November of 1936. I came to appreciate that my father was the first and foremost person to develop the clinical data demonstrating the tracer qualities of RAI and its use in the treatment of thyroid diseases. I later came to understand the RAI is the first targeted cancer therapy and that it represents the gold standard, even today. The materials revealed his commitment to teaching, research and practice. He clearly envisioned an integration of the sciences and that a targeted approach to cancer treatment would go beyond thyroid cancer.

What have you done to share his work?

To begin with, the American Thyroid Association (ATA), as part of its 74th annual meeting in 2002, held a “Saul Hertz Meets the Professor Luncheon.” I wrote a short article for the ATA’s newsletter highlighting my dad’s background and pioneering work. I also attended the meeting and was able to meet many of the ATA leaders and members.

The next year marked the Endocrine Society’s 85th Meeting in Philadelphia. I worked closely with Dr. Adolph Friedman, who had visited my dad in the 1940s in Boston during the early years of his research and was the first Washington, D.C. physician to use radioactive iodine. He headed the Endocrine Society’s history project and had developed a presentation featuring my father’s patient data charts that was displayed on the exhibit floor at the meeting.

My mission became clear that my dad’s story could and should be shared.

Dr. Saul Hertz.

The next significant step was his induction in the National Museum of American Jewish History. He is currently featured in the museum’s multimedia “Only in America” Gallery.

The staff at Harvard Medical School Countway Library of Medicine has offered suggestions, contacts and support. This relationship led me to endocrinologist Dr. Lewis Braverman, then-editor of Endocrine Practice, the peer-reviewed journal for the American Association of Clinical Endocrinologists. He encouraged me to work with his staff in developing an historical vignette for the magazine, which was published in July 2010. His father-in-law had been at The Beth Israel Hospital (now Beth Israel Deaconess Medical Center) when my dad was on staff there after World War II. The article reached Dr. Alvin Urles, who had been a young fellow under my dad’s direction at Beth Israel. He contacted me when he was 89 years of age and related many medical details about my father’s work.

2012 was a benchmark year in Boston. It marked MIT’s 150th year, Massachusetts General Hospital’s 200th year and 75 years since my father’s encounter with President Compton, which ultimately led to the building of MIT’s cyclotron and the radioactive iodine research. An author who was writing the history of Massachusetts General Hospital came to Connecticut to talk with me. He was particularly interested in my dad’s work and explained that he had been one of two practicing Jewish doctors at Massachusetts General in the 1930s. I later came to learn that when my dad arrived at MGH in 1931
that he was a Dalton Scholar in that Jewish doctors were not allowed on the staff at that time. There were quotas for Jewish students at Harvard Medical School when he graduated in 1929.

While attending the opening of MIT’s 150th anniversary museum exhibit, I was introduced to then-MIT President Susan Hockfield. She immediately recognized my dad’s work and spoke about his profound contribution to medicine and science. I then was invited to MIT’s 150th symposia, “Conquering Cancer through the Convergence of Science and Engineering,” held in March 2012 where American geneticist, molecular biologist and Nobel Prize winner Phillip Sharp spoke of dad’s work as MIT’s first cancer treatment.

Harvard Medical School honored my dad and the 75 years since his RAI research began at Vanderbilt Hall, the very place where MIT’s Dr. Compton had spoken. Significant correspondence, newspaper articles, two Journal of the American Medical Association articles that announced the effectiveness of the RAI treatment in hyperthyroid patients, photographs and more were displayed. Harvard Vanguard Medical Associates endocrine division chief and immediate past president of the American College of Endocrinology Dr. Jeffrey Garber and Dr. Braverman highlighted the history and my dad’s legacy, with Dr. Braverman stating, “We owe Saul Hertz a debt of gratitude.”

This motivated me to consider how to pay that debt, and I began pursuing avenues to share my father’s story. My local newspaper, the Greenwich Time, had a front-page story featuring my dad’s story on Father’s Day. Additionally, National Public Radio broadcast a Father’s Day tribute on its local Connecticut station. And the Society of Nuclear Medicine and Molecular Imaging (SNMMI) exhibited at its annual conference this past June the materials presented at the Harvard Medical School 2012 reception. These efforts, while significant, have led to my desire to further acknowledge my father’s work with the establishment of a yearly award in honor of my father’s accomplishments.

Why did you contact the American Association of Clinical Endocrinologists to honor Saul Hertz?

This Theodore Roosevelt quote made me think of all the members and support staff who are "...actually in the arena" for more than 70 years, along with countless future generations, who have carried or are carrying my dad’s dream forward:

“It is not the critic who counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who err, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who neither know victory nor defeat.” --Theodore Roosevelt

To pay tribute to the hope, courage and determination of Saul Hertz and other medical pioneers, Ms. Hertz has established the "Dare Bravely" Award.

Contributions to The Saul Hertz /RAI Dare Bravely Award can be sent to:

Donald C. Jones  
Chief Executive Officer  
American College of Endocrinology  
245 Riverside Avenue - Suite 200  
Jacksonville, FL 32202
Each year for the past 20 years, the American Association of Clinical Endocrinologists and the American College of Endocrinology have made it their mission to share information about thyroid disease in the hopes that all people whose thyroid gland does not function properly are diagnosed and treated.

And 2014 is no different.

An estimated 30 million Americans have some type of thyroid disorder, but only half of that number is aware and presumably seeking treatment...meaning 15 million Americans are undiagnosed for a health problem that can strike anyone at any stage of life.

That’s why we’re sharing information such as the thyroid information sheets on the following pages. Because if your thyroid’s not working properly, neither are you.

You can educate yourself about the thyroid gland and access additional helpful resources by visiting:


The blue paisley ribbon pictured here was introduced in 2012 as a universal symbol of thyroid disease awareness and advocacy. Paisley was chosen because of its resemblance to a cross-section of follicles, the tiny spheres that make up thyroid tissue.
What is hypothyroidism?

Hypothyroidism (underactivity of the thyroid gland) occurs when the thyroid gland produces less than the normal amount of thyroid hormone. The result is the “slowing down” of many bodily functions. Although hypothyroidism may be temporary, it usually is a permanent condition. Of the nearly 30 million people suffering from a thyroid condition, most have hypothyroidism.

What are the features of hypothyroidism?

In its earliest stage, hypothyroidism may cause few symptoms, since the body has the ability to partially compensate for a failing thyroid gland by increasing the stimulation to it, much like pressing down on the accelerator when climbing a hill to keep the car going the same speed. As thyroid hormone production decreases and the body’s metabolism slows, a variety of features may result.

- Pervasive fatigue
- Drowsiness
- Forgetfulness
- Difficulty with learning
- Dry, brittle hair and nails
- Dry, itchy skin
- Puffy face
- Constipation
- Sore muscles
- Weight gain and fluid retention
- Heavy and/or irregular menstrual flow
- Increased frequency of miscarriages
- Increased sensitivity to many medications

What are the major causes of hypothyroidism?

AUTO IMMUNE THYROIDITIS
(Hashimoto’s thyroiditis—separate brochure available)

The body’s immune system may produce a reaction in the thyroid gland that results in hypothyroidism and, often a goiter (enlargement of the thyroid). Other autoimmune diseases may be associated with this disorder, and additional family members may also be affected.

RADIOACTIVE IODINE TREATMENT

Hypothyroidism frequently develops as a desired therapeutic goal after the use of radioactive iodine treatment for hyperthyroidism.

THYROID OPERATION

Hypothyroidism may be related to surgery on the thyroid gland, especially if most of the thyroid has been removed.

MEDICATIONS

Lithium, high doses of iodine, and amiodarone (Cordarone, Pacerone) can cause hypothyroidism.

SUBACUTE THYROIDITIS

This condition may follow a viral infection and is characterized by painful thyroid gland enlargement and inflammation, which results in the release of large amounts of thyroid hormone into the blood. Fortunately, this condition usually resolves spontaneously. The thyroid usually heals itself over several months, but often not before a temporary period of hypothyroidism occurs.

POST PARTUM THYROIDITIS

Five percent to ten percent of women develop mild to moderate hyperthyroidism within several months of giving birth. Hyperthyroidism in this condition usually lasts for approximately one to two months. It is often followed by several months of hypothyroidism, but most women will eventually recover normal thyroid function. In some cases, however, the thyroid gland does not heal, so the hypothyroidism becomes permanent and requires lifelong thyroid hormone replacement. This condition may occur again with subsequent pregnancies.

SILENT THYROIDITIS

Transient (temporary) hyperthyroidism can be caused by silent thyroiditis, a condition which appears to be the same as postpartum thyroiditis but not related to pregnancy. It is not accompanied by a painful thyroid gland.

www.ThyroidAwareness.com
CONGENITAL HYPOTHYROIDISM

An infant may be born with an inadequate amount of thyroid tissue or an enzyme defect that does not allow normal thyroid hormone production. If this condition is not treated promptly, physical stunting and/or mental damage (cretinism) may develop.

CENTRAL HYPOTHYROIDISM

TSH is produced by the pituitary gland, which is located behind the nose at the base of the brain. Any destructive disease of the pituitary gland may cause damage to the cells that secrete Thyroid-Stimulating Hormone (TSH), which stimulates the thyroid to produce normal amounts of thyroid hormone. This is a rare cause of hypothyroidism.

How is hypothyroidism diagnosed?

Characteristic symptoms and physical signs, which can be detected by a physician, can signal hypothyroidism. However, the condition may develop so slowly that many patients do not realize that their body has changed, so it is critically important to perform diagnostic laboratory tests to confirm the diagnosis and to determine the cause of hypothyroidism.

TSH (THYROID – STIMULATING HORMONE OR THYROTROPIN) TEST

An increased TSH level in the blood is the most accurate indicator of primary (not central) hypothyroidism. Production of this pituitary hormone is increased when the thyroid gland even slightly underproduces thyroid hormone.

OTHER TESTS

- **Estimates of free thyroxine**: the active thyroid hormone in the blood. It is important to note that there is a range of free thyroxine levels in the blood of normal people, similar to the range for height, and that normal free thyroxine values for the general populations vary a great deal.
- **Thyroid autoantibodies**: indicates the likelihood of auto-immune thyroiditis being the cause of hypothyroidism. A primary care physician may make the diagnosis of hypothyroidism, but assistance is sometimes needed from an endocrinologist, a physician who is a specialist in thyroid diseases.

How is hypothyroidism treated?

Hypothyroidism is generally treated with a single daily dose of levothyroxine, given as a tablet. An experienced physician can prescribe the correct form and dosage to return the thyroid balance to normal. Older patients who may have underlying heart disease are usually started at a low dose and gradually increased while younger healthy patients can be started on full replacement doses at once. Thyroid hormone acts very slowly in some parts of the body, so it may take several months after treatment for some features to improve.

Since most cases of hypothyroidism are permanent and often progressive, it is usually necessary to treat this condition throughout one’s lifetime. Periodic monitoring of TSH levels and clinical status are necessary to ensure that the proper dose is being given, since medication doses may have to be adjusted from time to time. Optimal adjustment of thyroid hormone dosage is critical, since the body is very sensitive to even small changes in thyroid hormone levels. Levothyroxine tablets come in 12 different strengths, and it is essential to take them in a consistent manner every day. A dose of thyroid hormone that is too low may fail to prevent enlargement of the thyroid gland, allow symptoms of hypothyroidism to persist, and be associated with increased serum cholesterol levels, which may increase the risk for atherosclerosis and heart disease. A dose that is too high can cause symptoms of hyperthyroidism, create excessive strain on the heart, and lead to an increased risk of developing osteoporosis.

It is extremely important that women planning to become pregnant are kept well adjusted, since hypothyroidism can affect the development of the baby. During pregnancy, thyroid hormone replacement requirements often change, so more frequent monitoring is necessary. Various medications and supplements (particularly iron) may affect the absorption of thyroid hormone; therefore, the levels may need more frequent monitoring during illness or change in medication.

Thyroid hormone is critical for normal brain development in babies. Infants requiring thyroid hormone therapy should NOT be treated with purchased liquid suspensions, since the active hormone may deteriorate once dissolved and the baby could receive less thyroid hormone than necessary. Instead, infants with hypothyroidism should receive their thyroid hormone by crushing a single tablet daily of the correct dose and suspending it in one teaspoon of liquid and administering it promptly.

Appropriate management of hypothyroidism requires continued care by a physician experienced in the treatment of this condition.
Hyperthyroidism develops when the body is exposed to excessive amounts of thyroid hormone. This disorder occurs in almost one percent of all Americans and affects women five to ten times more often than men. In its mildest form, hyperthyroidism may not cause recognizable symptoms. More often, however, the symptoms are discomforting, disabling, or even life-threatening.

What are the features of hyperthyroidism?

When hyperthyroidism develops, a goiter (enlargement of the thyroid) is usually present and may be associated with some or many of the following features:

- Fast heart rate, often more than 100 beats per minute
- Becoming anxious, irritable, argumentative
- Trembling hands
- Weight loss, despite eating the same amount or even more than usual
- Intolerance of warm temperatures and increased likelihood to perspire
- Loss of scalp hair
- Tendency of fingernails to separate from the nail bed
- Muscle weakness, especially of the upper arms and thighs
- Loose and frequent bowel movements
- Smooth skin
- Change in menstrual pattern
- Increased likelihood for miscarriage
- Prominent “stare” of the eyes
- Protrusion of the eyes, with or without double vision (in patients with Graves’ disease)
- Irregular heart rhythm, especially in patients older than 60 years of age
- Accelerated loss of calcium from bones, which increases the risk of osteoporosis and fractures

What are the causes of hyperthyroidism?

GRAVES’ DISEASE

Graves’ disease (named after Irish physician Robert Graves) is an autoimmune disorder that frequently results in thyroid enlargement and hyperthyroidism. In some patients, swelling of the muscles and other tissues around the eyes may develop, causing eye prominence, discomfort or double vision. Like other autoimmune diseases, this condition tends to affect multiple family members. It is much more common in women than in men and tends to occur in younger patients.

TOXIC MULTINODULAR GOITER

Multiple nodules in the thyroid can produce excessive thyroid hormone, causing hyperthyroidism. Typically diagnosed in patients over the age of 50, this disorder is more likely to affect heart rhythm. In many cases, the person has had the goiter for many years before it becomes overactive.

TOXIC NODULE

A single nodule or lump in the thyroid can also produce more thyroid hormone than the body requires and lead to hyperthyroidism.

This disorder is not familial.

SUBACUTE THYROIDITIS

This condition may follow a viral infection and is characterized by painful thyroid gland enlargement and inflammation, which results in the release of large amounts of thyroid hormones into the blood.

Fortunately, this condition usually resolves spontaneously. The thyroid usually heals itself over several months, but often not before a temporary period of low thyroid hormone production (hypothyroidism) occurs.

POSTPARTUM THYROIDITIS

Five to ten percent of women develop mild to moderate hyperthyroidism within several months of giving birth. Hyperthyroidism in this condition usually lasts for approximately one to two months.

It is often followed by several months of hypothyroidism, but most women will eventually recover normal thyroid function. In some cases, however, the thyroid gland does not heal, so the hypothyroidism becomes permanent and requires lifelong thyroid hormone replacement. This condition may occur again with subsequent pregnancies.

SILENT THYROIDITIS

Transient (temporary) hyperthyroidism can be caused by silent thyroiditis, a condition which appears to be the same as postpartum thyroiditis but not related to pregnancy. It is not accompanied by a painful thyroid gland.

EXCESSIVE IODINE INGESTION

Various sources of high iodine concentrations, such as kelp tablets, some expectorants, amiodarone (Cordarone, Pacerone – a medication used to treat heart rhythms) and x-ray dyes may occasionally cause hyperthyroidism in patients who are prone to it.

OVERMEDICATION WITH THYROID HORMONE

Patients who receive excessive thyroxine replacement treatment can develop hyperthyroidism. They should have their thyroid hormone dosage evaluated by a physician at least once each year and should NEVER give themselves “extra” doses.

How is hyperthyroidism diagnosed?

Characteristic symptoms and physical signs of hyperthyroidism can be detected by a physician. In addition, tests can be used to confirm the diagnosis and to determine the cause.

TSH (THYROID-STIMULATING HORMONE OR THYROTROPIN) TEST

A low TSH level in the blood is the most accurate indicator of hyperthyroidism. The body shuts off production of this pituitary hormone when the thyroid gland even slightly overproduces thyroid hormone.

If the TSH level is low, it is very important to also check thyroid hormone levels to confirm the diagnosis of hyperthyroidism.

OTHER TESTS

- Estimates of free thyroxine and free triiodothyronine:
the active thyroid hormones in the blood. When hyperthyroidism develops, free thyroxine and free triiodothyronine levels rise above previous values in that specific patient (although they may still fall within the normal range for the general population), and are often considerably elevated.

- **TSI (thyroid-stimulating immunoglobulin):** a substance often found in the blood when Graves’ disease is the cause of hyperthyroidism. This test is not routinely ordered since it does not usually affect treatment decisions or help in the diagnosis.

- **Radioactive iodine uptake (RAIU - a measurement of how much iodine the thyroid gland can collect) and thyroid scan (a thyroid scan shows how the iodine is distributed throughout the thyroid gland).** This information can be useful in determining the cause of hyperthyroidism and ultimately its treatment.

Sometimes a general physician can diagnose and treat the cause of hyperthyroidism, but assistance is often needed from an endocrinologist, a physician who specializes in managing thyroid disease.

**How is hyperthyroidism treated?**

Before the development of current treatment options, the death rate from severe hyperthyroidism was as high as 50 percent. Now several effective treatments are available and, with proper management, death from hyperthyroidism is rare. Deciding which treatment is best depends on what caused the hyperthyroidism, its severity, and other conditions present. A physician who is experienced in the management of thyroid diseases can confidently diagnose the cause of hyperthyroidism and prescribe and manage the best treatment program for each patient.

**ANTITHYROID DRUGS**

In the United States, two drugs are available for treating hyperthyroidism: propylthiouracil (PTU) and methimazole (MMI). In general, AACE and the ATA recommend prescribing MMI over PTU. There are a few situations however where PTU should be used over MMI: during the first trimester of pregnancy to avoid an increased risk of a rare birth defect; if the patient is allergic to or intolerant of MMI; or when life-threatening thyrotoxicosis occurs. Some patients with hyperthyroidism caused by Graves’ disease experience a spontaneous or natural remission of hyperthyroidism after a 12- to 18-month course of treatment with these drugs, and may sometimes avoid permanent underactivity of the thyroid (hypothyroidism, which occurs as a result of using the other methods of treating hyperthyroidism. Unfortunately, the remission is frequently only temporary, with the hyperthyroidism recurring after several months or years off medication and requiring additional treatment, so relatively few patients are treated solely with antithyroid medication in the United States.

Antithyroid drugs may cause an allergic reaction in about five percent of patients who use them. This usually occurs during the first six weeks of drug treatment. Such a reaction may include rash or hives; but after discontinuing use of the drug, the symptoms resolve within one to two weeks and there is no permanent damage. A more serious effect, but occurring in only about one in 250-500 patients during the first four to eight weeks of treatment, is a rapid decrease of white blood cells in the bloodstream. This could increase susceptibility to serious infection. Symptoms such as a sore throat, infection, or fever should be reported promptly to your physician, and a blood cell count should be done immediately. In nearly every case, when a person stops using the medication, the white blood cell count returns to normal.

Very rarely, antithyroid drugs may cause severe liver problems, which can be detected by blood tests or joint problems characterized by joint pain and/or swelling. Your physician should be contacted if there is yellowing of the skin (“jaundice”), fever, loss of appetite, or abdominal pain.

**RADIOACTIVE IODINE TREATMENT**

Iodine is an essential ingredient in the production of thyroid hormone. Each molecule of thyroid hormone contains either four (T4) or three (T3) molecules of iodine. Since most overactive thyroid glands are quite hungry for iodine, it was discovered in the 1940’s that the thyroid could be “tricked” into destroying itself by simply feeding it radioactive iodine. The radioactive iodine is given by mouth, usually in capsule form, and is quickly absorbed from the bowel. It then enters the thyroid cells from the bloodstream and gradually destroys them. Maximal benefit is usually noted within three to six months.

It is not possible to eliminate “just the right amount” of the diseased thyroid gland, since radioactive iodine eventually damages all thyroid cells. Therefore, most endocrinologists usually strive to completely destroy the diseased thyroid gland with a single dose of radioactive iodine. This results in the intentional development of an underactive thyroid state (hypothyroidism), which is easily, predictably and inexpensively corrected by lifelong daily use of oral thyroid hormone replacement therapy.

Although every effort is made to calculate the correct dose of radioactive iodine for each patient, not every treatment will successfully correct the hyperthyroidism, particularly if the goiter is quite large and a second dose of radioactive iodine is occasionally needed.

Thousands of patients have received radioactive iodine treatment, including former President of the United States George Bush and his wife, Barbara. The treatment appears to be a very safe, simple, and reliably effective one. Because of this, it is considered by most thyroid specialists in the United States to be the treatment of choice for hyperthyroidism cases caused by overproduction of thyroid hormone.

**Radioactive iodine treatment should never be given to a pregnant woman!**

Small amounts of radioactive iodine will also be excreted in breast milk. Since radioiodine could permanently damage the infant’s thyroid, breast-feeding is not allowed. If radioactive iodine is inadvertently administered to a woman who is subsequently discovered to be pregnant, the advisability of terminating the pregnancy should be discussed with the patient’s obstetrician and endocrinologist. Therefore, prior to administering diagnostic or therapeutic radioiodine treatment, pregnancy testing is mandatory whenever pregnancy is possible.

**SURGICAL REMOVAL OF THE THYROID**

Although seldom used now as the preferred treatment for hyperthyroidism, operating to remove most of the thyroid gland may occasionally be recommended in certain situations, such as a pregnant woman with severe uncontrolled disease in whom radioiodine would not be safe for the baby. Surgery usually leads to permanent hypothyroidism and lifelong thyroid hormone replacement therapy.

**OTHER TREATMENTS**

A drug from the class of beta-adrenergic blocking agents (which decrease the effects of excess thyroid hormone) may be used temporarily to control hyperthyroid symptoms until other therapies take effect. In cases where hyperthyroidism is caused by thyroiditis or excessive ingestion of either iodine or thyroid hormone, this may be the only type of treatment required.

Appropriate management of hyperthyroidism requires careful evaluation and ongoing care by a physician experienced in the treatment of this complex condition.
Why is it important to take care of the thyroid during pregnancy?

Even before conception, thyroid conditions that have lingered untreated can hinder a woman’s ability to become pregnant or can lead to miscarriage. Fortunately, most thyroid problems that affect pregnancy are easily treated. The difficulty lies in recognizing a thyroid problem during a time when some of the chief complaints — fatigue, constipation, and heat intolerance — can be either the normal side effects of pregnancy or signals that something is wrong with the thyroid.

Although detecting a thyroid problem is important, it is equally necessary for those already diagnosed with a condition to have the thyroid checked if they are planning to become pregnant or are pregnant.

Thyroid hormone is necessary for normal brain development. In early pregnancy, babies get thyroid hormone from their mothers. Later on as the baby’s thyroid develops it makes its own thyroid hormone. An adequate amount of iodine is needed to produce fetal and maternal thyroid hormone. The best way to ensure adequate amounts of iodine reach the unborn child is for the mother to take a prenatal vitamin with a sufficient amount of iodine. Not all prenatal vitamins contain iodine, so be sure to check labels properly.

Who should be tested?

Despite the impact thyroid diseases can have on a mother and baby, whether to test every pregnant woman for them remains controversial. As it stands, doctors recommend that all women at high risk for thyroid disease or women who are experiencing symptoms should have a TSH and an estimate of free thyroxine blood tests and other thyroid blood tests if warranted. A woman is at a high risk if she has a history of thyroid disease or thyroid autoimmunity, a family history of thyroid disease, type 1 diabetes mellitus, or any other autoimmune condition. Anyone with these risk factors should be sure to tell their obstetrician or family physician. Ideally, women should be tested prior to becoming pregnant at prenatal counseling and as soon as they know they are pregnant.

Hypothyroidism during pregnancy

When a woman is pregnant, her body needs enough thyroid hormone to support a developing fetus and her own expanded metabolic needs. Healthy thyroid glands naturally meet increased thyroid hormone requirements. If someone has Hashimoto’s thyroiditis or an already overtaxed thyroid gland, thyroid hormone levels may decline further. So, women with an undetected mild thyroid problem may suddenly find themselves with pronounced symptoms of hypothyroidism after becoming pregnant.

What are the risks of an underactive thyroid gland during pregnancy?

In the United States, most women who develop hypothyroidism during pregnancy develop mild disease and may experience only mild symptoms or sometimes no symptoms. However, if you had a mild, undiagnosed condition before becoming pregnant, the condition may worsen. A range of signs and symptoms may be experienced, but one needs to be aware that these can be easily written off as normal features of pregnancy. Untreated hypothyroidism, even a mild version, may contribute to possible pregnancy complications. Treatment with sufficient amounts of thyroid hormone replacement significantly reduces the risk for developing any of the following pregnancy complications associated with hypothyroidism:

- Abruptio placentae
- Premature birth
- Postpartum hemorrhage
- Pre-eclampsia
- Anemia
- Miscarriage

Treating hypothyroidism during pregnancy

There is no difference between treating hypothyroidism when a woman is pregnant than when she isn’t. Levothyroxine sodium pills are completely safe for use during pregnancy. They will be prescribed in dosages that are aimed at replacing the thyroid hormone the thyroid isn’t making so that the TSH level is kept within normal ranges. Once a woman begins taking thyroid hormone pills, she will be monitored closely until her TSH level is within normal ranges. Once it is, the physician may also counsel patients to take their thyroid hormone pills at least one-half hour to one hour before or at least three hours after they take iron-containing prenatal vitamins or calcium supplements, both of which can interfere with the absorption of thyroid hormone.

Hyperthyroidism during pregnancy

Graves’ disease tends to strike women during their reproductive years, so it should come as no surprise that it occasionally occurs in pregnant women. Reports on pregnancies lasting longer than twenty weeks suggest that Graves’ disease occurs in 2 per 1,000 pregnancies or 0.2 percent of all pregnancies.
Pregnancy may worsen a preexisting case of Graves’ disease. Graves’ disease can also emerge for the first time, typically during the first trimester of pregnancy. The disease is usually at its worst during the first trimester. It tends to then improve in the second and third trimesters and flare up again after delivery.

**What are the risks of an overactive thyroid during pregnancy?**

A woman with hyperthyroidism while pregnant puts her at an increased risk for experiencing any of the signs and symptoms of hyperthyroidism. And unless the condition is mild, if it is not treated promptly, a woman could miscarry during the first trimester; develop congestive heart failure, pre-eclampsia, or anemia; and, rarely, develop a severe form of hyperthyroidism called thyroid storm, which can be life threatening.

Hyperthyroidism, if untreated, can lead to stillbirth, premature birth, or low birth weight for the baby. Sometimes it leads to fetal tachycardia, which is an abnormally fast pulse in the fetus. Women with Graves’ disease have antibodies that stimulate their thyroid gland. These antibodies can cross the placenta and stimulate a baby’s thyroid gland. If antibody levels are high enough, the baby could develop fetal hyperthyroidism, or neonatal hyperthyroidism.

**How is hyperthyroidism diagnosed during pregnancy?**

As with hypothyroidism, diagnosing hyperthyroidism based on symptoms can be tricky because pregnancy and hyperthyroidism share a host of features. Still, one should be aware of the symptoms and bring them to the attention of a doctor if they are experiencing them. For instance, feeling a heart flutter or suddenly becoming short of breath, both symptoms of hyperthyroidism, can be normal in pregnancy, but a doctor still may want to investigate these symptoms. An individual with any risk factors for thyroid disease should make certain they are tested.

While hyperthyroidism can easily be diagnosed through blood tests, finding out what’s causing it may require scanning tests that use minimal amounts of radioactive iodine. During pregnancy, however, scanning tests are not done because small amounts of radioactivity may cross the placenta and become concentrated in the baby’s thyroid gland. Antibody tests can be used to distinguish Graves’ disease from other causes (For more information, please see the TSI section in the Hyperthyroidism information). A physical exam can help diagnose or distinguish a toxic adenoma or toxic multinodular goiter.

**Treating hyperthyroidism during pregnancy**

Very mild hyperthyroidism usually does not require treatment, only routine monitoring with blood tests to make sure the disease does not progress. More serious conditions require treatment. However, treatment options are limited for pregnant women. While methimazole (MMI) is the drug of choice, propylthiouracil (PTU) should be used during the first trimester of pregnancy due to an increased risk for a rare birth defect. Other situations in which PTU would be used include when a patient is allergic to or intolerant of MMI, or when life-threatening thyrotoxicosis occurs. Radioactive iodine, which is typically used to treat Graves’ disease, cannot be used during pregnancy because it easily crosses the placenta, potentially damaging the baby’s thyroid gland and causing hypothyroidism in the baby.

Due to its potential risks, the goal of treatment is to use the minimal amount of antithyroid drugs possible to maintain a patient’s T4 and T3 levels at or just above the upper level of normal, while keeping TSH levels suppressed. When hormones reach the desired levels, drug doses can be reduced. This approach controls hyperthyroidism while minimizing the chances of a baby developing hypothyroidism.

**Thyroid diseases in children**

Thyroid problems are much less common in children than adults, but when they strike, they can be more worrisome because of their potential effect on children’s growth and developing brains.

In adults, treatment usually reverses the effects of thyroid diseases, even when they go undetected for years. Yet in early childhood, hypothyroidism can lead to permanent mental deficiencies and short stature if it is not treated promptly. Hyperthyroidism can lead to accelerated growth in children, and when it affects infants, it can be fatal.

Thanks to screening programs that test all newborns for hypothyroidism, the immutable effects of that disease are prevented in numerous children. Each year, in North America alone, more than five million newborns are screened annually, and hypothyroidism is detected and treated in fourteen hundred of these infants.

A child may be born with a thyroid condition or may develop one sometime during childhood. Diagnosing thyroid diseases that aren’t detected through screening programs can be especially tricky, since it is up to the parent to recognize when something is wrong. This certainly isn’t easy when dealing with young children who aren’t talking yet or with older children who may not be able to describe what they feel—or even know what they are feeling isn’t normal.

If you or someone in your family has a thyroid condition, your child may be at a higher risk for developing a thyroid disorder.
Hold the mirror in your hand, focusing on the lower front area of your neck, above the collarbones, and below the voice box (larynx). Your thyroid gland is located in this area of your neck.

While focusing on this area in the mirror, tip your head back.

Take a drink of water and swallow.

As you swallow, look at your neck. Check for any bulges or protrusions in this area when you swallow.

Reminder: Don’t confuse the Adam’s apple with the thyroid gland. The thyroid gland is located further down on your neck, closer to the collarbone. You may want to repeat this process several times.

If you do see any bulges or protrusions in this area, see your physician. You may have an enlarged thyroid gland or a thyroid nodule that should be checked to determine whether further evaluation is needed.

Visit www.ThyroidAwareness.com
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