

# The THYROID

## A Little Gland That Does a Big Job

BY JUDITH NEMBHARD

**T**hough a relatively small gland, the thyroid has a far-reaching effect on the function of some of the body's most important organs such as the heart, brain, liver, kidneys and skin. Without the hormones the thyroid produces and releases into the bloodstream, many of the body's essential functions slow down. "Today, about 5 to 7.5 percent of the U.S. population has some kind of thyroid disease," says Dr. Asma Khan, a practicing endocrinologist with Academic Endocrinology, Diabetes and Metabolism at Erlanger Medical Center. With the prevalence of thyroid dysfunction in the U.S., this tiny gland continues to draw the attention of both patients and medical professionals.

### The Thyroid: Basics

The thyroid gland, located at the front of the neck just below the Adam's apple, is a part of the endocrine system. Two inches long and shaped like a butterfly, the thyroid consists of two halves, or lobes. The thyroid is brownish in color and rich in blood vessels, and it contains nerves important for voice quality. When the gland is a normal size, it cannot be felt by applying finger pressure to the throat.

During a baby's development in the womb, the thyroid is located at the back of the tongue and has to "migrate" to the front of the neck before birth. In rare instances, the thyroid migrates too far or not far enough—there have been cases where the gland remained at the back of the tongue, creating a condition known as *lingual thyroid*.

# Innovative procedure controls leakage after prostate surgery

BY SUSAN SAWYER

When two close relatives took a simple blood test that can provide important information for assessing a man's risk for prostate cancer, Walter Pendergrass decided he should get tested, as well.

"My son and nephew inspired me. I figured if they could get the test, I could, too," says Pendergrass. "Fortunately for them, their test results were good. But I wasn't so lucky."

Pendergrass' prostate-specific antigen (PSA) test revealed high levels of PSA, an indication that he had an increased risk of prostate problems. After a biopsy confirmed the presence of cancerous tissue, Dr. Amar Singh, director of minimally invasive surgery and urologic oncology at Erlanger Health System, performed robotic surgery on Pendergrass to remove the cancerous prostate tumor.

Unfortunately, Pendergrass' diagnosis is not unusual in our region. More cases of prostate cancer are diagnosed in Hamilton County than any other type of cancer. Moreover, cancer of the prostate occurs about 60 percent more often in African American men than white men, and it's more likely to be advanced once it is diagnosed.



Although most men encounter mild incontinence issues after prostate surgery, nature usually helps the body resume urinary control within a few months. But 18 months after prostate cancer surgery, Pendergrass' leakage had intensified. "It got to the point I had lost all control," he recalls. "I was going through three pads a day, and I'd wake up in the morning totally soaked."

Urinary incontinence occurs when the sphincter muscle is not strong enough to hold back the urine in the bladder. This often happens after prostate cancer surgery, as in the case of Pendergrass.

When fragile pelvic muscle tissues cause urine leakage, Kegel exercises can help reinforce the pelvic floor muscles. Often recommended to women by physical

therapists, the exercises can also be beneficial for men.

Kegel exercises, however, failed to help Pendergrass. But during a visit to Colin Goudelocke, MD, urologist with Academic Urology at Erlanger East, the East Ridge resident was thrilled to learn that other treatment options were available to resolve his incontinence issues.

Dr. Goudelocke, who has advanced fellowship training in incontinence for both males and females, explains that one option for bladder control in men is an artificial urinary sphincter. This mechanical device works successfully for many men, who typically experience urinary control about six weeks after surgery. The main drawbacks are the slight risks of failure for the mechanical device and infections, which may require additional surgery and device replacement down the road.

Since individuals with diabetes – like Pendergrass – have a higher risk of infection from surgical procedures, Dr. Goudelocke determined that the artificial urinary sphincter was not the best treatment option for his patient. But the urologist knew Pendergrass was the perfect candidate for an innovative treatment solution known as a "male sling."

This outpatient procedure repositions the urethra with a synthetic, mesh-like surgical tape to restore urinary control. The minimally invasive procedure does not require open abdominal surgery and reduces the risk of surgical infections, making it an ideal option for individuals like Pendergrass with diabetes.

Better yet, Pendergrass experienced immediate results. As soon as the one-hour procedure ended, Pendergrass awakened to discover his leakage problems had disappeared. Today, the 72-year-old says, "I'm glad Dr. Goudelocke was here to solve my problems. Everything has turned out just lovely!"

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## The Functioning Thyroid

The thyroid's main role in the endocrine system is to regulate the metabolism. All other cells in the body depend on the thyroid for this function. "The thyroid gland is like our body's thermostat," says Zynia Pua-Vines, M.D., a family practice physician with Memorial Health System. "It controls heat production and energy utilization." Using a different image, Dr. Khan says, "You can think of the thyroid hormones as the fuel of the body." Because our bodies "burn" the fuel at different rates, a person's metabolism can be fast or slow.

In order to regulate the body's metabolism, the thyroid gland extracts iodine from the blood and converts it into hormones—thyroid cells are highly specialized to absorb and use iodine. The pituitary, sometimes called the "master gland" of the endocrine system, and the hypothalamus—both located in the brain—are the two glands that control the thyroid. The hypothalamus produces TSH Releasing Hormone (TRH) to signal the pituitary gland to secrete thyroid-stimulating hormone (TSH). When the TSH is released in the blood by the pituitary, the thyroid responds by producing more hormones.

The two main hormones the thyroid produces and releases are T3 (tri-iodothyronine) and T4 (thyroxine). A thyroid that is functioning normally produces around 80 percent T4 and 20 percent T3. "Most T4 gets converted into T3 in the body," Khan says.

In addition to metabolism and body temperature, thyroid hormones affect brain development, breathing, heart and nervous system functions, muscle strength, skin dryness, menstrual cycles, weight and cholesterol levels.

A third hormone called calcitonin is produced by specialized cells called



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C-cells in the thyroid gland. While calcitonin affects calcium levels in the blood and the build-up of calcium in the bones, the significance of its function is not well known. Calcitonin is not considered to be a thyroid hormone, although it is produced in the thyroid.

## Thyroid Dysfunction

Thyroid dysfunction occurs when there is either an overproduction or underproduction of thyroid hormones. If a person has a thyroid disorder, his or her body uses energy more slowly or more quickly than it should. While thyroid dysfunction is frequently the result of disease, injury or

a dietary deficiency, it might also be due to stress, genetics or use of certain medications. For those questioning whether there is an issue, a physical exam including various blood tests can quickly detect abnormal thyroid hormone levels. This can be administered easily by a primary care physician or an endocrinologist.

## Hypothyroidism

Hypothyroidism is when the thyroid gland is underactive, or does not produce sufficient levels of thyroid hormones. (*Hypo-* means "under" or "below normal"). Common symptoms of an underactive thyroid include weight gain, fatigue, depression, mood swings, dry hair and skin, constipation and difficulty with colder temperatures. People with hypothyroidism may also show an increase in cholesterol levels and women may have a heavier or an irregular menstrual flow.

According to Dr. Pua-Vines, hypothyroidism is a common problem. "It affects about 1 percent of the general population and some 5 percent of people over 60," she says. Although hypothyroidism often affects middle-aged and older women, anyone can develop the condition, including infants and teenagers. Hypothyroidism that is present at birth, or *congenital hypothyroidism*, can result in a condition of severely stunted physical and mental growth called *cretinism*. However, in most developed countries, babies are tested for hypothyroidism a few days after birth so they can begin treatment right away if necessary.

In the United States, the most common causes of hypothyroidism are *auto-immune diseases*, or conditions in which a person's immune system mistakenly attacks a part of his or her body.



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**Dr. Michael Czarnecki** is a Doctor of Medicine with specialty training in Pulmonary and Critical Care from Baylor College of Medicine in Houston Texas. He is active in both the clinical treatment and research into minimally invasive diagnosis and staging of lung cancer, pleural based lung disease pathogenesis, COPD exacerbation control, and airway stenting indications and complications. Dr. Czarnecki is a Pulmonologist and Critical Care Intensivist and remains an active Paramedic.



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Doctors Mark and  
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In *autoimmune hypothyroidism*, the immune system accidentally attacks cells in the thyroid gland, interfering with their ability to make thyroid hormones. *Hashimoto's thyroiditis* is the most common of these autoimmune disorders, and it affects approximately 14 million people in the U.S. However, worldwide, the most common cause of hypothyroidism is a lack of iodine in the diet. Other causes of hypothyroidism include radiation therapy, thyroid surgery, medications, a pituitary disorder and antibodies developed during pregnancy.

Hypothyroidism often goes unnoticed—sometimes for years—before it is diagnosed. According to the American Thyroid Association, more than half of people who have hypothyroidism don't know it. Untreated over time, the disorder can

cause significant health problems such as infertility and heart disease. However, if a person is diagnosed with the disorder, its treatment with synthetic thyroid hormones including synthetic T4 or a combination of synthetic T4 and T3 is usually simple, safe and according to Dr. Khan, "extremely effective."

Thyroid malfunction often occurs during pregnancy—it is estimated that 2.5 percent of all pregnant women have some degree of hypothyroidism. Women who have hypothyroidism should discuss the condition with their doctor before becoming pregnant. Undetected hypothyroidism in a soon-to-be mother can increase her chances of miscarriage and pre-term delivery or affect the growth and brain development of her unborn child. Additionally,

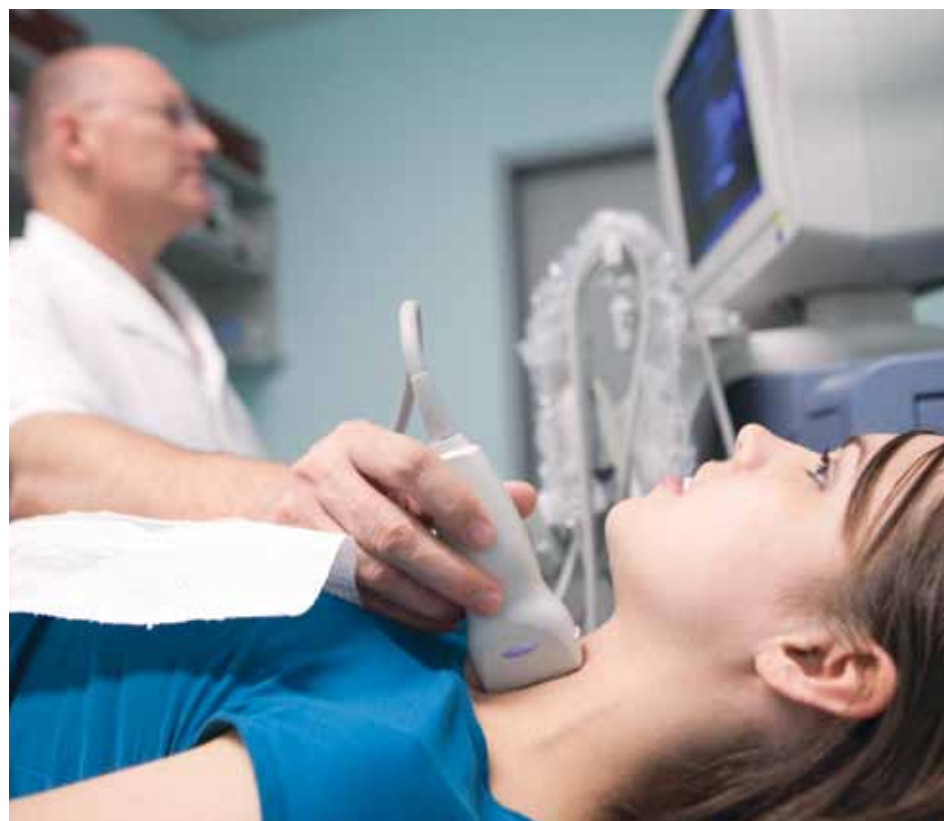
according to Dr. Pua-Vines, about 5 to 9 percent of women may experience thyroid issues within the first six months after delivery. "Although 80 percent of these women will regain normal thyroid function, they should be aware that it does put them at risk of developing permanent hypothyroidism," she says. Fortunately, thyroid medications can help prevent these problems and are considered safe to take during and after pregnancy.

### Hyperthyroidism

Excessive thyroid hormone production is called hyperthyroidism. (*Hyper* means "over" or "above normal"). Hyperthyroidism significantly accelerates the body's metabolism, and it often causes sudden weight loss, rapid or irregular heartbeat, sweating and nervousness. People with this condition are often sensitive to heat and have large appetites. Other evidences of hyperthyroidism include hand tremors, increased bowel movements and difficulty sleeping, and women with hyperthyroidism may have light or absent menstrual periods.

Older adults are likely to have no symptoms or subtle ones such as becoming tired while performing ordinary activities. It is important to understand that beta blockers—medications used to treat high blood pressure and other conditions—can mask many of the symptoms of hyperthyroidism. According to the Mayo Clinic, people who think they may have hyperthyroidism should describe their symptoms in detail to a doctor, as many of them can be associated with a number of other conditions.

The most common cause of hyperthyroidism is *Graves' disease*, an autoimmune disorder that attacks the thyroid, resulting in the overproduction of thyroid hormones. This kind of hyperthyroidism



**The thyroid's main role in the endocrine system is to regulate metabolism.**

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tends to run in families, and it is common in women under the age of 40. Graves' disease sometimes causes the eyes to bulge, a condition known as *Graves' ophthalmopathy*. Other causes of hyperthyroidism are thyroid nodules, use of certain medications or *thyroiditis*—inflammation of the thyroid that causes the gland to leak thyroid hormones.

Hyperthyroidism can lead to many serious problems, so even if symptoms seem insignificant, it is important for a patient to receive treatment. Serious complications resulting from hyperthyroidism can involve the heart, such as heart rhythm disorder and congestive heart failure—a condition in which the heart cannot circulate enough blood to meet the body's needs. Osteoporosis can also result from hyperthyroidism. The strength of bones partially depends on the amount of calcium and other minerals they contain, and too much thyroid hormone interferes with the body's ability to incorporate calcium into bones.

Although hyperthyroidism is serious, most people respond well once the condition is diagnosed and treated. The best treatment depends on a person's age and other factors, and some individuals may need more than one kind of treatment. To treat hyperthyroidism, doctors can prescribe radioactive iodine or anti-thyroid medications to slow the production of thyroid hormones. According to the American Thyroid Association, more than 70 percent of adults in the U.S. who develop hyperthyroidism are treated with radioactive iodine. Radioactive iodine works by only destroying or damaging the thyroid cells that have absorbed it, while anti-thyroid medications such as methimazole or propylthiouracil (PTU) block the thyroid gland's ability to make new thyroid hormones. A last treatment option for hyperthyroidism is surgery to remove part of the thyroid gland.


## Tissue Growths

Besides thyroid dysfunctions and the diseases and complications associated with them, a lump may occasionally be found on the thyroid.

**Thyroid Nodules:** Thyroid nodules are abnormal growths of thyroid tissue that are located in the thyroid gland. These lumps can be solid or fluid-filled, like cysts. The likelihood of developing a thyroid nodule increases with age, and

most people will develop a thyroid nodule by the time they are 50 years old. Ninety-five percent of thyroid nodules are benign, and most cause no symptoms at all. Some thyroid nodules, however, may be large enough to press on the esophagus, making it uncomfortable or difficult to swallow.

**Thyroid Cancer:** Thyroid cancer accounts for a small percentage of thyroid nodules. Thyroid cancer can affect anyone at any age, but people who have a family history of it or have had exposure to high levels of radiation are more likely to develop the condition. Although symptoms are not always apparent early on, hoarseness, neck pain and enlarged lymph nodes may occur. According to the Mayo Clinic, most cases of thyroid cancer can be cured with treatment.

January marks the beginning of the American Association of Clinical Endocrinologist's (AACE) thyroid awareness month. As the new year approaches, take time to educate yourself on the issues and complications surrounding this tiny, yet powerful gland. With a better understanding of the thyroid, you may be able to give hope and help to someone suffering from an unknown condition. 

*Judith P. Nembhard is a Chattanooga resident. She is a graduate of the University of Maryland where she received her Ph.D. in English education. Judith is a member of the Chattanooga Writers Guild and has two sons. Judith is a lifelong educator and a published writer.*

## Thyroid Top 10

Take note of this important information from EmPower, the joint awareness initiative of the American College of Endocrinology (ACE) and the American Association of Clinical Endocrinologists (AACE).

1. As many as 27 million Americans may be affected by thyroid disorders, although more than half remain undiagnosed.
2. Thyroid disorders are more common amongst women.
3. Thyroid disorders tend to run in families.
4. Fatigue is a common complaint for under and overactive thyroid conditions.
5. TSH testing is the most useful test for thyroid screening.
6. Regular check-ups are the key to successfully managing a malfunctioning thyroid gland.
7. Changing formulations and dosage that affect thyroid hormone levels should be followed by retesting.
8. Do not change your dose of thyroid medication without guidance from your physician.
9. Thyroid conditions in pregnancy warrant close attention.
10. Thyroid cancer is one of the fastest growing cancers in America and one of the most curable.

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