WHEN IS A THYROID CANCER NO LONGER A THYROID CANCER?

ALSO IN THIS ISSUE:

• Diabetes and You: Why Body Shape Matters
• Meet Your Body’s Master Gland, the Pituitary
• What Every Man Needs To Know About Testosterone Replacement Therapy
What do you call kids who don’t let type 1 diabetes stand between them and their dreams?

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Secondary Osteoporosis: Other Causes of a Decrease in Bone Density

While the aging process is often partially to blame for the bone-loss condition osteoporosis, there are other disorders that can cause secondary osteoporosis, a condition that can arise at any age and affects men and women equally.

Diabetes and You: Why Body Shape Matters

Can body shape really determine your risk for diabetes? Here we answer that question with a detailed examination of factors that contribute to the disease.

Meet Your Body’s Master Gland, The Pituitary

No larger than the size of an average pencil eraser, the pituitary is a master at monitoring and regulating the function of many other endocrine glands.

When is a Thyroid Cancer No Longer a Thyroid Cancer?

Members of the international medical community released an important scientific paper earlier this year that reclassifies a specific type of thyroid cancer – Non-Invasive Follicular Tumors with Papillary-Like Nuclear Features (NIFTP) – to reduce treatment that may not be beneficial. Here thyroid experts provide some highlights for patients.

Life In Balance: A Classic Hypothyroidism Patient Regains Her Health

When Bostonian Ronni Hochman began experiencing an array of seemingly unconnected health issues, little did she know it would take several years to discover her underperforming thyroid gland was to blame.

What Every Man Needs To Know About Testosterone Replacement Therapy

In recent years, testosterone testing has become more commonplace, driven in part by an aging population, but also due to increased promotion of testosterone replacement therapies.

Do You Take Care of an Older Adult with Diabetes? Your Support Can Go A Long Way

The National Diabetes Education Program (NDEP) offers some valuable tips for caregivers of elderly loved ones coping with diabetes.

Little-Known Consequences of Diabetes

It’s common knowledge that diabetes can cause a number of complications that can include cardiovascular disease, nerve damage and eye problems. There are, however, additional consequences of the disease that are less well-known but equally serious.
AACE recently adopted the universal endocrine logo design (left), which is intended to serve and be recognized by the scientific community and the public at large as an international symbol of recognition of all areas of the specialty of endocrinology (academic/research/clinical).

In its simplest form, the logo represents a continuous loop that conveys the concept of endocrine science, education, communication, safety, and overall good endocrine health; lay focus groups identified “balance” and endocrinologists identified “feedback loop” – both are desired interpretative attributes.

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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.

For more information, visit us at www.empoweryourhealth.org
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Everything you like about this magazine...

and (much, much) more.

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Most people recognize osteoporosis as a disease in which problems within the body’s skeleton cause it to weaken and fracture with very little trauma, particularly as part of the aging process. This is known as primary osteoporosis, which is responsible for 8.9 million fractures worldwide each year. In the U.S. alone, it’s estimated to affect 10 million Americans, with an additional 34 million diagnosed with low bone mass.

There is, however, evidence of an increase in both men and pre-menopausal women of secondary osteoporosis, a condition in which certain medical conditions or treatments interfere with the attainment of peak bone mass and may cause bone loss. The focus of this article is to review its most common endocrine causes.

The mechanism of osteoporosis

Bones are dynamic, living organs with multiple functions. Besides skeletal formation, bones are involved in mineral regulation, acid-base status, (the balance between acidity and alkalinity compounds in the blood, which it needs to function properly), and the production of platelets, red blood cells and white blood cells.

Due to constant mechanical stress, bones are frequently breaking down and rebuilding. This normal process is called remodeling. Osteoporosis occurs when there is a mismatch in bone turnover and typically involves more rapid bone breakdown than normal due to the action of osteoclasts (a large bone cell that breaks down bone tissue and is responsible for bone resorption) versus the action of bone buildup created by osteoblasts (a cell that makes bone).

There are two types of bone: cortical (kŏr′ti-kāl) and cancellous (kan′sē-lŭs—denoting bone that has a lattice-like or spongy structure). Cortical bone makes up the outer layer of the bone structure while cancellous bone fills the inside portion. Although most bones are a mix of cortical and cancellous bone, some have a higher percentage of one type. For example, the spine is composed mainly of cancellous bone, the forearm is mainly cortical and the hip is comprised of both types. This is important because secondary causes of osteoporosis affect bone remodeling differently and, therefore, may have different treatment modalities.

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Secondary causes of osteoporosis can be divided into several categories: endocrine, gastrointestinal, hematologic, rheumatologic, medications and miscellaneous. The chart above includes a list of common conditions known to cause secondary osteoporosis. This article will further address the endocrine system category.

**Hyperthyroidism**

Hyperthyroidism is a condition in which the thyroid gland is overactive and produces excessive thyroid hormone. Symptoms may include weight loss, rapid or irregular heartbeat, sweating and irritability. Excess thyroid hormone may be due to a single overactive nodule, known as a toxic adenoma, multiple overactive nodules, known as toxic multi-nodular goiter, or autoimmune gland stimulation known as Graves’ disease. Thyroid hormone affects both bone buildup and breakdown, with excess hormone resulting in more bone breakdown, bone weakening and subsequent fractures.

**Hyperparathyroidism**

Hyperparathyroidism results in excessive parathyroid hormone. This may be caused by an overactive single parathyroid gland, commonly called primary hyperparathyroidism, or from secondary causes such as vitamin D deficiency, which may stimulate all four parathyroid glands. Parathyroid glands are small glands of the endocrine system, located in the neck behind the thyroid, that regulate the amount of calcium, which is used to control many systems in the body. Parathyroid hormone released by the glands regulates calcium, phosphorus and vitamin D. In a healthy individual without kidney disease, high levels of parathyroid hormone will increase the active form of vitamin D, increase calcium absorption from the gut and kidney, and cause phosphorus excretion in the urine. In addition, parathyroid hormone will actively break down cortical bone, found mainly in the forearm and femoral neck (hip), thus weakening them and predisposing a person to fractures. If primary hyperparathyroidism is suspected, your doctor may order additional images of the forearm.

**Hypercortisolism**

Cortisol is a hormone made in the adrenal glands, which are located on the top of the kidneys, and is released in times of stress. Excessive cortisol can result when the adrenal glands synthesize excessive cortisol in a condition known as Cushing’s syndrome, or when one takes oral steroids (i.e., hydrocortisone, prednisone, or dexamethasone) for an extended period of time. Both conditions result in weakening of the bones – cancellous bone more so than cortical bone – and may lead to spinal vertebral fractures. Depending on your underlying condition, your physician may order an additional imaging test called a Vertebral Fracture Assessment (VFA) to specifically examine your spine.

**Diabetes mellitus**

Both type 1 and type 2 diabetes ultimately lead to a decrease in insulin production by the pancreas. Type 1 diabetes is typically
found in younger, leaner patients and is due to autoimmune destruction of the pancreas, whereas type 2 diabetes is often seen in older, overweight individuals and thought to be due to pancreas burnout accompanied by insulin resistance, a condition in which the body’s cells don’t respond normally to insulin, thus preventing glucose (blood sugar) from entering the body’s cells. Insulin, as well as another pancreatic hormone called amylin, may be important in bone formation. Hence, the lack of insulin may contribute to low bone mineral density and increased fracture risk. Additionally, uncontrolled diabetes results in vision impairment and nerve damage in the feet, which may predispose patients to fall. Furthermore, the use of certain antidiabetic medications has been shown to increase fractures in postmenopausal women.

**Hypogonadism**

Estrogen and testosterone, sex hormones found in both women and men, are crucial in bone health, with estrogen thought to be the key hormone. Estrogen is formed from testosterone and is found in both women and men, although women have higher levels of the hormone. Estrogen works by promoting osteoblasts and, thus, bone formation. It also inhibits osteoclasts, preventing bone breakdown. Common causes of low sex hormones may include aging and medications as well as thyroid dysfunction, pituitary disease, diabetes and obesity. In both women and men, if either the ovaries or testicles fail to produce sex hormones, bone loss may result. In women below 40 years of age, this is called primary ovarian failure and is usually treated with estrogen replacement therapy.

**Vitamin D Deficiency**

Vitamin D is a fat-soluble vitamin that enhances calcium absorption in the gut and maintains adequate calcium and phosphate levels in the blood, both which are needed for bone mineralization. Without sufficient vitamin D, bones may weaken. This condition is known as osteomalacia in adults and rickets in children. Parathyroid hormone, discussed earlier, may also increase with low levels of vitamin D, thus worsening bone breakdown.

Vitamin D deficiency with or without calcium deficiency has been associated with several gastrointestinal malabsorptive disorders (malabsorption is abnormality in absorption of food). These include celiac disease, inflammatory bowel diseases such as Crohn’s and ulcerative colitis, and certain gastric bypass surgeries.

**Evaluation and treatment of osteoporosis**

The diagnosis of osteoporosis is made either by imaging, typically with dual-energy x-ray absorptiometry (DEXA) without vertebral fracture assessment (VFA), or by a non-traumatic vertebral fracture. It is universally accepted that all women over 65 should be screened for osteoporosis. For men and women younger than 65 with secondary causes of osteoporosis, screening guidelines vary by medical society.

A laboratory evaluation may include a complete blood count, complete metabolic panel (specifically kidney and liver functions, calcium, magnesium and phosphorus), thyroid function tests, vitamin D levels, parathyroid hormone, testosterone, 24-hour urine for calcium and cortisol, tissue transglutaminase and serum/urine protein electrophoresis.

In most cases, treatment of secondary osteoporosis involves targeting the underlying cause. For example, if someone has a parathyroid adenoma (non-cancerous tumor) that is producing excess parathyroid hormone, the treatment is either surgery or medicine, depending on other risk factors. The exception to this is a patient who requires long-term glucocorticoids, typically defined as prednisone 5 milligrams daily for three months. In these patients, some organizations recommend preventive treatment with a bisphosphonate, a class of drugs that prevent the loss of bone mass.

Regardless of the underlying cause, most patients with secondary osteoporosis are advised to consume adequate vitamin D and calcium (amounts vary depending on age and sex) and to perform weight-bearing exercises. Other treatment options include medications such as bisphosphonates or a daily injection that promotes bone formation, known as teriparatide. Follow-up labs tests and imaging will depend on the disease’s cause, severity and treatment.

The bottom line: Heightened awareness of the potential presence of secondary osteoporosis and increased vigilance for its detection are essential in improving bone health in these patients.

For additional information, visit: [http://www.empoweryourhealth.org/endocrine-conditions/osteoporosis](http://www.empoweryourhealth.org/endocrine-conditions/osteoporosis)
It's common knowledge that obesity is a key risk factor for the development of type 2 diabetes. But there are other, perhaps less-well-known risk factors that can help identify people at risk for developing diabetes. Among them: not only the size of your body, but where that extra weight is stored. In addition to heart disease, people who carry their weight around the middle are particularly at risk of developing diabetes.

There are three basic body types defined by distribution of body fat. These are android (apple shape), intermediate and gynoid (pear shape). Apple-shaped bodies have larger waists with a lot of weight around the abdomen. Pear-shaped bodies carry more weight around the hips and have thinner waists. However, the concern here is far deeper than just physical appearance. The important distinction is that people whose fat collects on their abdomen (central obesity), making them resemble an apple, are at a greater risk for type 2 diabetes. On the other hand, fat in the hips and legs (as seen in pear-shaped bodies) is linked to healthier metabolic profiles. So body shape becomes an important factor in determining whether a person is more or less likely to develop diabetes.

What influences body shape?

Although central obesity is a feature of certain endocrine diseases such as Cushing’s syndrome, in the majority of people it is due to the imbalance between amount of food eaten and calories burned. Excessive alcohol consumption and screen time (time spent on sedentary activities such as the Internet, video games and television) can also lead to central obesity. And aging makes matters worse. With increasing age, the rate at which the body burns calories slows down, making it even harder to maintain a healthy weight. Post-menopausal women tend to gain more belly fat, likely due to decreasing estrogen, which appears to influence fat distribution. And in some cases, genetics can also play a role in the amount of fat that is stored and where it is stored.

How does central obesity contribute to diabetes mellitus?

Following food intake and digestion, blood sugar levels rise. In response to this rise in blood sugar, the body produces insulin to help the body utilize sugar for energy and keep blood sugar levels within normal range. Scientific studies have shown central obesity to be associated with insulin resistance, a state in which body cells fail to respond to insulin effectively. This results in high blood sugar levels and diabetes mellitus. In addition, central obesity also increases risk of cardiovascular disease, colorectal cancer, sleep apnea and high blood pressure.

Is body mass index alone a good predictor of diabetes?

For a long time, body mass index (BMI) – calculated by dividing a person’s weight in kilograms by the square of the person’s height in meters – has been used as a measure to define obesity (a BMI of 30 or higher is considered obese, signified as BMI > 30 kg/m2). However, there are two concerns about BMI. First, it does not differentiate between fat mass and lean (muscle) mass, which means a person in great physical condition may have a higher BMI due to increased muscularity rather than increased fatness. Second, BMI does not take into account the distribution of body fat. Therefore, validity of BMI alone as a predictor of diabetes mellitus is now being questioned.

Waist circumference and waist-to-hip ratio may be better predictors than BMI. Central obesity is assessed in a doctor’s office by measuring a person’s waist-to-hip circumference ratio (WHR). Waist circumference is measured at the highest point of the iliac crest, the thick curved upper border of the ilium, the most prominent bone on the pelvis. Hip circumference is measured at the greatest circumference of the buttocks. Central obesity is defined by waist-to-hip circumference ratio greater than 0.90 for men and 0.85 for women.

In a recent study from Mayo Clinic, the BMI and WHR of 15,184 adults were examined. Researchers found that persons with normal BMI but with central obesity (high WHR) had the worst long-term survival compared to those with similar BMI but no
central obesity. These findings have significant clinical implications. During routine health maintenance visits, WHR ratio is usually not assessed. Therefore, a person with normal BMI and central obesity might not get screened for DM.

It is best to use BMI and WHR in conjunction, rather than either method alone. A person with BMI > 30 kg/m² is certainly at risk for obesity-related health concerns. However, a pear-shaped body should prompt discussion about improving lifestyle in general, rather than focused on risk of DM and heart diseases.

How can central obesity be reduced?

Restoring the balance between calorie intake and energy expenditure is key to diminishing central obesity. In fact, often, expending more energy than one is taking in as food is necessary to kick-start the process of restoring a healthy weight. A food diary (either a book or a mobile app) can be helpful in this circumstance. Keeping track of what you eat and drink, how much you move and daily screen time can help you and your doctor design a meal and physical activity plan that works best for you to reduce central obesity and your risk for developing DM.

The Departments of Health and Human Services (HHS) and Agriculture’s (USDA) 2015-2020 Dietary Guidelines for Americans emphasize a plant-based diet including vegetables, whole fruits, grains and low-fat dairy. Lean meat, legumes, nuts, seeds and soy products are healthy sources of protein. There is strong evidence that consuming lower amounts of processed meats and processed poultry are associated with reduced risk of obesity and diabetes mellitus. Limiting added sugars, replacing sugar-sweetened beverages with water and watching portion sizes will help to keep belly fat in check.

Physical activity can be helpful as well. According to the HHS Physical Activity Guidelines for Americans, adults need at least 150 minutes of moderate-intensity aerobic activity every week and muscle-strengthening activities two or more days a week. Physical activity can be spread out over the week, with as little as 10 minutes at a time being considered beneficial. Brisk walking, pushing a lawn mower, dancing and biking count as aerobic or cardio exercises. Muscle-strengthening activities include lifting weights, resistance exercises, push-ups, sit-ups and heavy gardening.

Spot exercise targeted towards a specific muscle or location of the body can be beneficial. However, the common myth that toning abdominal muscles with crunches or push-ups gets rid of central obesity is not true. While these exercises might certainly strengthen the abdominal muscles and help them hold belly fat in, they do little for decreasing the belly fat itself. Muscle-strengthening activities should focus on all major muscle groups including the legs, hips, back, chest, abdomen, shoulders and arms.

And along with its many mind-body benefits, yoga has been shown to be beneficial in prevention and management of diabetes mellitus.

In present times, the expression “prevention is better than cure” holds true in the context of diabetes and heart diseases, more than for anything else. These lifestyle diseases contribute significantly to health care burden and require massive preventive measures. Since body shape is predetermined to a degree, adopting a healthier, more active lifestyle is the key.

The pituitary gland. You’ve likely heard of it, but what does it actually do?

As with many of the endocrine system’s collection of glands, the pituitary toils away consistently and inconspicuously with little recognition of its considerable contribution to a person’s well-being.....that is, until its performance goes awry. That’s when you learn just how important the pituitary is to your body’s overall function. In fact, it is often referred to as the body’s “master gland.”

So what is the function of this tiny structure? Why is it so important? And how would you know if it’s not operating properly? Here we provide an overview of this fascinating organ.

What is the pituitary gland?

Found at the base of the brain behind the bridge of the nose, the pituitary gland is often referred to as the endocrine system’s control center. This is because it controls many glands, among them the thyroid glands, the ovaries, the testicles (testes) and the adrenal glands.

Remarkably, this regulating gland is no larger than the size of an average pencil eraser. It produces many hormones that travel throughout the body, directing certain processes or stimulating other glands to produce hormones. Among them are prolactin, which stimulates breast development and milk production after childbirth and also affects sex hormone levels and fertility; growth hormone, which stimulates growth in children and is important for maintaining muscle and bone mass in adults; vasopressin, which regulates the amount of water excreted by the kidneys; ACTH (adrenocorticotrophin hormone), which stimulates the production of the “stress hormone” cortisol, which is produced by the adrenal glands; and TSH (thyroid stimulating hormone), which influences the thyroid gland to produce more hormones when a too-low level of thyroid hormone is detected. TSH decreases when satisfactory thyroid hormone bloods levels have been reached.

The pituitary gland is connected to, and controlled in large part by, the hypothalamus, a region of the brain that lies just above the pituitary. By detecting the levels of hormones produced by glands under the pituitary’s control, the hypothalamus or the pituitary can determine how much stimulation the glands need.

What are the symptoms of a pituitary disorder?

The pituitary gland can malfunction in several ways, as a result of a tumor or when there is over- or under-production of one or more hormones, which can happen at the same time.

How do you know if you have a pituitary problem? If you can answer yes to one or more of the following questions, you may want to consider scheduling an appointment with an endocrinologist to determine an appropriate course of action.
**For Adults**
Have you experienced change in vision, either loss of side (peripheral) vision or blurred vision? Are you experiencing menstrual irregularities? Are you experiencing sexual dysfunction? Are you experiencing an enlargement of the fingers, face or forehead? Do you bruise easily (without injury)? Do your muscles feel weak?

**For Children**
Are they growing at a normal rate? Are they showing signs of puberty too early? Girls before age 7? Boys before age 8? Are they lacking signs of puberty, including girls over age 13 or boys over age 14? Are they drinking excessive amounts of water (more than 2 quarts per day)?

**For Menarchal Girls**
Do they have a milky discharge from their breasts? Have they missed more than one period?

**Pituitary Tumors**
The most common type of pituitary disorder is a non-cancerous tumor (an adenoma). If you feel that you may have symptoms which could be caused by a pituitary tumor, you should discuss these symptoms with your physician. A detailed history and physical examination will then be done to determine whether measurement of specific pituitary hormones is necessary, as well as formal visual field testing. If findings are suggestive that a tumor may be present, a pituitary magnetic resonance imaging (MRI) examination will be ordered.

If you have been diagnosed with an adenoma, here is some information to help guide you. First, pituitary tumors are not a common cause of medical problems. They represent only about 10 percent of all tumors in the head. They are not “brain tumors,” since the pituitary is located just below the main portion of the brain. Pituitary tumors may sometimes cause headaches, but this is actually quite rare. They do not cause loss of thinking function, movement or sensation. However, if untreated, pituitary tumors may lead to loss of vision as well as symptoms arising as a consequence of pituitary hormone deficiency or excess. Working with an endocrinologist, a specialist in endocrine disorders, as part of your healthcare team is a vital component in maintaining an optimal lifestyle while living with pituitary abnormalities. With proper care, many people live with pituitary problems and lead normal, healthy, happy lives.

In addition to pituitary adenomas, there are many other, less-common conditions that can affect the pituitary gland, including other tumors, cysts and inflammation. These can also cause pituitary underactivity or lead to vision loss.

Once diagnosed, your treatment will be determined based on how the tumor was found. If the tumor was discovered as part of a routine MRI examination, then further testing will be necessary, which will be more extensive if the tumor exceeds a certain size or appears on the MRI image to press upon the visual pathway. If the tumor was found because of pressure symptoms or loss of pituitary function, detailed hormonal testing as well as visual evaluation is necessary. If the tumor was found because of over-secretion of pituitary hormones, the rest of the pituitary hormones will need to be tested.

**What are the treatment options for pituitary tumors?**
Treatment is based upon the behavior of the pituitary gland. If it is overproducing prolactin, then it will be treated, in most cases, with an oral medication (pill) which can reduce the over-secretion of this hormone and often shrink the tumor if one is present. If the tumor is secreting excess growth hormone (causing a condition called acromegaly or gigantism), or ACTH, which can cause Cushing’s disease, then the gland will be treated in most cases with surgery aimed at removing the tumor while sparing the normal gland.

Generally, pituitary tumors are removed by an operation called a transsphenoidal adenomectomy, performed while the patient is under general anesthesia. The pituitary gland is reached by a surgical incision on the inside of the nose or lip; the surgeon then proceeds through the sinus cavity to reach the tumor. The surgeon generally uses an endoscope or an operating microscope to provide magnification and allow an optimal view of the tumor during surgery. A small incision is often made in the skin of the abdomen to remove a small amount of fat tissue, which is used to pack the wound after the pituitary tumor is removed.

(Continued on page 12)
In the event that surgery becomes necessary, it is extremely important that surgery be performed by an experienced pituitary neurosurgeon, as surgical results are dependent upon the skill and experience of the surgeon. Your endocrinologist should discuss with you the surgical team in your area which is best equipped to handle your care. If you live in an area without such a team, referral to a center with experience in pituitary surgery is advised.

Complications of pituitary surgery may include loss of normal pituitary function (such as control of the amount of salt and water in the blood, which must be kept more or less the same all the time to avoid cell damage) and — sometimes — infection, bleeding or leakage of spinal fluid from inside the brain cavity through the nose. After surgery, patients generally require blood tests to monitor their levels of sodium and cortisol (a steroid hormone) in the blood during the first several weeks after surgery. They also need follow-up testing of pituitary function and MRI examination of the pituitary several weeks to months after surgery.

In some cases where surgery is ineffective, additional treatment with radiation therapy is used. Radiation therapy for pituitary tumors can take various forms, including stereotactic radiosurgery (Gamma Knife®, proton beam, linear accelerator or Cyberknife®) – a non-surgical radiation therapy that focuses high-power energy on a small area of the body – or conventional radiation therapy. Radiation therapy is best administered in medical centers with specialized expertise. Radiation therapy directed to the pituitary may lead to loss of pituitary function over time, necessitating regular monitoring (including hormone testing) and appropriate hormone replacement therapy, as needed. Otherwise, radiation therapy used for pituitary tumors is generally safe and usually not associated with serious side effects. Your endocrinologist and radiation oncologist will discuss with you the specific indications, benefits and risks of radiation therapy in your particular situation.

Medications may be prescribed in some patients with tumors producing growth hormone or ACTH, generally as a second-line treatment after unsuccessful surgery. In these patients, medications can control hormone excess and, in some cases, shrink tumor size. Medication may also be required to replace the hormones that are deficient due to the pituitary disorder. These medications may include hydrocortisone (“cortisone”) or prednisone to replace inadequate adrenal function, thyroid hormone (levothyroxine) to address hypothyroidism, and sex hormones to replace missing hormones (estrogen and progesterone for women, testosterone for men). Growth hormone replacement is generally necessary to restore appropriate growth in children. In adults with a pituitary disorder, growth hormone deficiency may be associated with symptoms of fatigue, poor quality of life, abnormal fat accumulation and osteoporosis (thinning of the bones). If growth hormone is missing, then its possible use in adults should be discussed in detail with the endocrinologist.

In many cases, lifelong therapy is needed. In all cases, regular monitoring and follow-up is needed under the care of the endocrinologist, who will assure that the medication remains effective and well-tolerated.

Often no therapy is prescribed for small, stable tumors that are not over-secreting any hormones or otherwise causing vision problems or loss of hormone function.

What steps can I take to support my treatment?

After diagnosis, it often becomes necessary to share vital information about your tumor with appropriate medical personnel. Having this information at your fingertips greatly facilitates the efficiency of your medical team. The following is information you should keep updated and accessible:

- What is the size of the tumor?
- Is the tumor currently pressing on any vital structures?
- According to the current blood tests, what hormones are over-secreted (present in excess)?
- What hormones are under-secreted (deficient)?
- What are my current symptoms?
- Have I received any treatments for my pituitary condition? If so, which one(s) and when?

Questions to ask your doctor at each examination:

- How often should I come back for follow-up?
- What symptoms would you like me to report to you in between visits?
- Do I need surgery, continued medication, or radiation therapy?
- Do you expect that the medication that I am currently on will be required indefinitely?
You can become an active participant in protecting your well-being by visiting www.thyroidawareness.com.

The site features in-depth content about thyroid disease risk factors, symptoms, and treatment options, as well as downloadable flyers about the range of thyroid conditions.
In April 2016, a group of physicians including pathologists (physicians who diagnose diseases by examining abnormal cells and tissues) along with endocrinologists and surgeons who also specialize in treating patients with thyroid disorders made a very important statement about thyroid cancer: Many cases previously diagnosed as thyroid cancer were not cancer after all. This declaration drew national and international attention and was reported in The New York Times among other media outlets. Many patients from among the more than half-million people in the U.S. with previously and recently diagnosed thyroid cancer contacted their physicians in order to find out what this meant for them. The complete report appeared in the April 2016 Journal of the American Medical Association—Oncology and was entitled “Nomenclature Revision for Encapsulated Follicular Variant of Papillary Thyroid Carcinoma: A Paradigm Shift to Reduce Overtreatment of Indolent Tumors.”

The purpose of this communication is to review this report, whom it applies to and what it really means for patients now.

What is thyroid cancer?
The thyroid gland is a small, butterfly-shaped gland that normally weighs less than an ounce and is located at the base of the neck below the larynx (voice box). The thyroid gland consists of two cell types: follicular cells and C-cells. The follicular cells are the dominant cells of the thyroid and make thyroid hormone that sets the pace of your metabolism, the chemical activity by which cells convert nutrients into energy. Thyroid cancer is a type of tumor or growth arising in the thyroid gland. Most thyroid growths termed thyroid nodules are not cancer. Cancerous tumors are those that may invade or grow within the thyroid or into the nearby tissues and organs or spread throughout the body.

How common is thyroid cancer?
About 60,000 new cases of thyroid cancer are expected to be diagnosed in the U.S. in 2016 with over two-thirds occurring in women. There are presently over 600,000 Americans who have been diagnosed with thyroid cancer.

Generally thyroid cancer is slow growing, rarely causes pain or disability, is easily treated, and may be cured with surgery alone. Despite its rising incidence, which is mostly due to more detection, the number of people dying from thyroid cancer per year in the U.S. has stayed about the same for many years, at around 2,000.

What are the most common types of thyroid cancer?
A majority of thyroid cancers arise from the follicular cells of the thyroid. Papillary thyroid cancer accounts for about 75 to 80 percent. Follicular thyroid cancers make up about 10 percent. Not only are these two types far and away the most common type of thyroid cancers arising from thyroid follicular cells, but they also generally carry the best prognosis and chance for cure.

Editor’s Note: The names of the different types of papillary and follicular thyroid cancers are similar sounding because they are all cancers arising from follicular cells, the hormone-producing cells of the thyroid.

Which type of cancer was the new recommendation about?
It was about a type of papillary thyroid cancer that has been called “encapsulated follicular variant of papillary thyroid cancer” (EFVPTC). Encapsulated refers to the fact that it is fully surrounded by a capsule or a shell. “Follicular variant” refers to the fact that the cells are arranged in groups that resemble normal thyroid cell groups. This type of cancer is now estimated to make up approximately 10 to 20 percent of all thyroid cancers.
What were the main points of the new recommendation?

1) The group of expert physicians concluded that that EFVPTC was not a cancer
   This was based on studying over 100 patients previously diagnosed with EFVPTC whose treatment was surgery alone – and in the majority of instances only limited to surgery. Before being included in the study, the patients’ diagnosis of EFVPTC was confirmed by a group of 24 thyroid pathologists who reanalyzed every case (some cases did not qualify). During at least 10 years of follow-up examinations, and in some cases over 20 years, no patient had evidence of cancer at any point after their initial treatment.

2) Since EFVPTC did not behave like a “cancer” it should be renamed
   The group proposed classifying these tumors “noninvasive follicular thyroid neoplasm with papillary-like nuclear features” (NIFTP). Neoplasm is a synonym for tumor, which in this case is benign. Noninvasive refers to the fact that even under a microscope the tumor was confined by the limits of its capsule, which remained intact or remains within its boundary. In case there is no capsule, a “circumscribed” or very well-defined tumor that does not extend beyond its very well-defined borders is also considered non-invasive. Papillary refers to the similarity some cells have features to what is seen in a typical papillary thyroid cancer.

Why is this so important?
   Less treatment and monitoring would be called for:
   • Only surgery will be required to remove the tumor
   • Limited surgery will be sufficient
   • Radioactive iodine treatment will not be necessary
   • Treatment with lower doses of thyroid hormone than what is typically prescribed for those with thyroid cancer may be appropriate
   • Less follow-up and testing

Additionally, learning that one does not have cancer provides immense relief in the short term and eliminates the psychological burden one carries after being diagnosed with cancer.

Since NIFTP is not cancer, why does any surgery have to be done?

1) Even though NIFTP does not appear to be cancer, some experts believe that over time it may progress to a cancer.
2) There are no shortcuts to diagnosing NIFTP. It cannot be diagnosed by ultrasound, needle biopsy (AKA fine-needle aspiration or FNA), blood test or molecular analysis (see more information at: http://www.empoweryourhealth.org/magazine/vol7_issue1/doctor_what_do_you_mean_you_cant_tell_whether_i_have_thyroid_cancer). Most important, it must be distinguished from invasive forms. This can only be achieved after the tumor is completely surgically removed. Doing so enables the thyroid pathologist to study enough pieces of the tumor in order to make sure that the entire capsule and vessels surrounding it do not contain any tumor. NIFTP then is not a diagnosis that can be made from a needle biopsy. Surgery has to be done to obtain this diagnosis.

What should and can those with previously diagnosed EFVPTC do to find out if they had or have thyroid cancer?

Recently diagnosed cases require careful review of the entire tumor by a pathologist familiar with how to diagnose NIFTP. If the diagnosis of EFVPTC was made over a decade ago and there has never been any evidence of cancer following initial therapy, re-examination of the original pathology may not be necessary. Review of other cases should be discussed with your physicians and considered on a case-by-case basis, keeping in mind that in many cases there may not be enough material available to be able to carefully re-analyze it.

What don’t we know about NIFTP?

Although the recommendations were based on strong grounds, the study that served as the basis for the reclassification was a relatively small one, involving just over 100 cases. Some studies have reported similar findings but clearly additional studies over time will be required to confirm the reported findings.

What questions remain?

1) Will the criteria for diagnosing NIFTP be universally adopted and accurately employed by pathologists throughout the USA who diagnose thyroid cancer?
2) Will the new recommendations affect the way physicians care for patients with thyroid cancer?
3) Over the long-term will patients benefit from these recommendations?
Fatigue, achiness, problems sleeping at night or lacking focus during the day. While all are very basic symptoms that many people seem to experience, these (and others) are all signs that your body is trying to tell you something. And if persistent, they very well could be the result of a low level of thyroid hormone.

Such was the case with Boston native Ronni Hochman.

In her early 40s, Hochman began experiencing a host of seemingly disconnected maladies that had begun taking a toll on her daily life. “I was tired, I had aches and pains, my face was pale and puffy, I had an irritable bowel, I was cold all of the time, basically my entire system seemed to be a little off,” she reminisces.

In what she refers to as a two-year “process of elimination,” Hochman underwent a number of procedures ordered by her internist to determine what was causing her symptoms, particularly her “out of synch” GI tract. Among them was a colonoscopy to test for colon cancer or other gastrointestinal disorders, which came back negative, as well as a lactose intolerance test, which also produced negative results.

“Although it took a little longer than I wished to be diagnosed, ultimately what I needed was one simple blood test, which was finally conducted and revealed my thyroid hormone levels were extremely low, so I was diagnosed immediately with hypothyroidism as it was evident that this is what was causing my problems,” she notes.
Hypothyroidism occurs when the thyroid - a small, butterfly-shaped gland at the base of the neck that influences the way your body produces energy and uses it, controls your body temperature and helps your organs stay on track and working well - produces insufficient thyroid hormone, affecting every cell, tissue and organ in the body.

Once diagnosed, Hochman was referred to endocrinologist and thyroid expert Dr. Jeffrey Garber, Chief of the Endocrinology Division at Harvard Vanguard Medical Associates and a member of the Beth Israel Deaconess Medical Center and Brigham and Women's Hospitals endocrine divisions.

“There are a number of reasons people with hypothyroidism often go undiagnosed or are misdiagnosed, and Ronni’s case was a classic example of that,” Dr. Garber advises. “The symptoms are not specific or special. Some of us experience them some of the time, and a lot of us experience a fair number of them on a regular basis. So, it’s a masquerader, in a sense.”

“The way to home in on the condition is to ask yourself if these are symptoms you’ve had for years and years, or if something’s changed and they’re more severe or persistent,” he continues. “This is particularly important if you’re at risk or have a family history.”

“Ironically, when I told my mom of my diagnosis, she informed me that she was hypothyroid too, so there was a family history that I was unaware of before I was diagnosed,” Hochman adds. “If I had known that ahead of time, I would have been able to bring that to the attention of my doctor and my problem may have been addressed a little more quickly.”

Dr. Garber prescribed levothyroxine for Hochman, a synthetic hormone taken once a day at the same time of day that replaces the hormone normally produced by the thyroid gland and the gold standard for hypothyroidism treatment.

Although she initially experienced some side effects from the medication – she specifically mentions delayed word recall – once her body adjusted to the medication, she was back to normal in short order. “The medication changed my life dramatically,” Hochman says. “My body began working the way it’s supposed to when it’s operating under proper levels of thyroid hormone. That’s why it’s so important that people are aware, because the thyroid does control so many of the body’s systems.”

Dr. Garber is quick to note the perils of an undiagnosed thyroid problem beyond the inconvenience it presents.

“It needs to be emphasized that a delayed diagnosis comes with a price,” he says. “People can develop heart conditions as a result of their blood pressure being elevated or their cholesterol being up. And, in Ronni’s case, a colonoscopy being done on someone who’s as profoundly hypothyroid as she was at the time can be perilous, as people who are hypothyroid are exquisitely sensitive to sedation. It’s fortunate that she was as healthy as she was.”

He encourages patients to engage their doctors and start the conversation by asking, “Could this be my thyroid?”

“The good news is that thyroid disease is easily detectable given the correct blood test,” he says.

These days, 20 years after her diagnosis, Hochman is as fit as a fiddle and works full-time in account management for an award-winning communications solutions company. Still taking her once-daily levothyroxine, she undergoes annual checkups with Dr. Garber to make sure her thyroid levels are where they need to be. “On occasion we’ve adjusted my dosage, which is not uncommon, but I’ve been consistent with taking my medication to make sure those thyroid hormone levels remain consistent. They keep my life in balance.”

For more information about hypothyroidism, as well as other thyroid conditions, their causes, symptoms and treatment, visit www.thyroidawareness.com.
Hypothyroidism occurs when a person’s thyroid gland – the master gland of the body’s metabolism – does not produce enough thyroid hormone for the body’s needs, a condition that impacts virtually every cell, tissue and organ system in the body.

The thyroid gland weighs less than 1 ounce and is located at the front of your throat below the voice box (larynx). Shaped like a butterfly, the thyroid has two lobes connected by a middle section of tissue called the isthmus.

**WHAT IS HYPOTHYROIDISM?**

Hypothyroidism can cause:
- Hoarseness, deepening of voice, difficulty swallowing; water retention can lead to swelling of the vocal chords.
- Constipation due to slow motility of the colon
- Menstrual irregularities, infertility (male and female)
- Muscle stiffness or weakness
- Dry, brittle hair and nails
- Depression, inability to concentrate, forgetfulness, moodiness
- Puffy eyes
- Weak or slow heartbeat
- Dry, patchy skin, numbness or tingling
- Constipation due to slow motility of the colon
- Puffy eyes
- Weak or slow heartbeat
- Dry, patchy skin, numbness or tingling

**GENERAL SYMPTOMS**

- Persistent fatigue – low thyroid function results in less energy
- Weight gain – an underactive thyroid slows down all your body processes. Your body converts fewer calories into energy, leading to weight gain.
- Sensitivity to cold – the body conserves heat energy by constricting the blood vessels to the skin.
- Elevated cholesterol – lack of thyroid hormone slows the liver’s ability to remove excess cholesterol from the blood

**STATISTICS**

Studies estimate that more than 10 percent of the U.S. general population suffers from hypothyroidism, yet hypothyroidism frequently goes undiagnosed. Because symptoms are not concentrated in a single area of the body and may seem vague, it’s common for them to be disregarded or attributed to other causes.

The goal of hypothyroidism treatment is to replicate normal thyroid function and return the body to a balanced state. Daily synthetic thyroid supplements (levothyroxine sodium) are the preferred treatment for hypothyroidism today. Though they are man-made, they are the exact same as the hormones produced in your body. In the great majority of cases, treatment for hypothyroidism is for life. Fortunately, the medications available today are effective, safe, and will improve your quality of life.
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Male hypogonadism, which refers to either inadequate production of testosterone by the body and/or sperm by the testes, may be diagnosed when a low blood level of testosterone is detected. This hormone is the main sex hormone in a male and plays a key role in building muscle mass and bone density, reducing body fat and improving sex drive.

Several decades ago testosterone was rarely measured in men unless there was an obvious reason to do so, for example, either not going through puberty or exhibiting signs of fertility problems, or for symptoms such as fatigue, low sex drive or erectile dysfunction. Over the past decade, however, testosterone testing has become more commonplace, driven in part by an aging population, more precise tests and, arguably, a proliferation of so-called “low-T clinics.” Plus, makers of testosterone products have been heavily advertising their products, thus increasing awareness of the hormone and available treatments.

If you’re one of the millions of men who had a blood test that revealed low testosterone levels, you may be asking yourself (and your physician) if testosterone supplementation is necessary. You may also be asking about the differences between the many and varied testosterone products on the market.

**Evaluation**

First, a note about the science: There are several different types of testosterone tests performed by laboratories. Most doctors start by ordering a total testosterone and/or a free testosterone test. Much of the testosterone in the blood is bound to a protein called sex hormone binding globulin (SHBG). Free testosterone is not bound to protein and is easily used by the body. Plus, free testosterone can help provide more information when total testosterone is low.

The tricky thing to keep in mind is that it is unclear whether the total or free testosterone is the better test at assessing a man’s “androgen status”; an androgen is any of a group of hormones that primarily influence the growth and development of the male reproductive system.

To make things more complicated, it is possible to have a normal level of one type of testosterone and a low measurement of another. For example, many overweight or obese men have low levels of total testosterone, but normal levels of free testosterone. This often relates to differences in proteins that are bound to testosterone, such as SHBG.

And different labs establish their own “normal range” for testosterone such that one lab may report a range of 241-827 ng/dL (nanograms per deciliter), whereas another lab can report a normal range of 348-1197 ng/dL. For this reason, there is not one magic number that separates normal from low testosterone.

Regardless of which test is used, the diagnosis of male hypogonadism generally requires confirming one low level with a second test, as testosterone levels fluctuate during the day. Your doctor will likely request that you have your testosterone level checked with a blood test performed in the morning when levels tend to be at their highest.

**Treatment**

If you elect to undergo testosterone supplementation, it’s important to note that the decision can be tricky and should be individualized, as there is no “one-size-fits-all” approach. Not all men with symptoms and low testosterone levels require treatment with testosterone. For example, an obese man may choose to lose weight, which in turn can increase his own production of testosterone. Similarly, a man who is not getting much sleep can increase his sleep duration to seven-to-eight hours per night to enhance testosterone production.
When a doctor recommends testosterone therapy, the decision should be based upon the individual’s signs and symptoms, blood levels of testosterone, age and other medical conditions. For this reason, men with abnormal testosterone results are advised to discuss their results with an endocrinologist or other physician who has expertise in the area.

Unfortunately, it is often difficult to predict whether a man’s symptoms (such as low sex drive or fatigue) are related to his low testosterone levels or another malady. For this reason, many men are prescribed a three-to-six-month trial of testosterone therapy. For men who experience an improvement in symptoms, it is often reasonable to continue the therapy. For those whose symptoms do not show a marked improvement, it is often best to stop the therapy as their symptoms are likely related to something other than testosterone.

**A Note Of Caution**

You should not receive testosterone therapy if you have a contraindication such as prostate cancer, breast cancer, a high red blood cell count, uncontrolled heart failure or untreated severe sleep apnea. And men with lower urinary tract symptoms due to an enlarged prostate may experience a worsening of symptoms, as testosterone can cause the prostate to enlarge further. Finally, testosterone is not approved to increase athletic ability or strength or for anti-aging purposes.

**Therapy Options**

There are a variety of different testosterone products approved by the U.S. Food and Drug Administration (FDA) for male hypogonadism. You may be wondering which product is the best. The correct answer is that there is no right answer. Imagine that you need to travel from Washington, D.C. to New York City. Some people may prefer to fly, others to take a train and others to take a bus. While all methods can successfully get you to where you need to go, each method has its own advantages and disadvantages. The same pros and cons apply to testosterone products. Which formulation you choose will likely depend on how it is taken, how often it is taken, potential side effects and your insurance co-pay or out-of-pocket cost. Currently a pill form (oral) of testosterone is not available in the United States, although it is available in some other countries.

To help you compare products, here is a summary table of the testosterone options:

<table>
<thead>
<tr>
<th>Type</th>
<th>Route</th>
<th>How often</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injections</td>
<td>Intramuscular (self-administered)</td>
<td>Every 1-3 weeks</td>
<td>- Pain at injection site</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Fluctuating levels of testosterone</td>
</tr>
<tr>
<td>Injections</td>
<td>Intramuscular (given at doctor’s office)</td>
<td>Every 10 weeks</td>
<td>- Pain at injection site</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Need to wait at office for 30 minutes after injection</td>
</tr>
<tr>
<td>Gels</td>
<td>Topical (skin)</td>
<td>Daily</td>
<td>- Avoid skin-to-skin contact with a woman or child if the gel has not dried</td>
</tr>
<tr>
<td>Patch</td>
<td>Topical (skin)</td>
<td>Daily</td>
<td>- Skin rash/irritation is common</td>
</tr>
<tr>
<td>Topical solution</td>
<td>Topical (skin) to armpit</td>
<td>Daily</td>
<td></td>
</tr>
<tr>
<td>Pellets</td>
<td>Implanted into fat under skin</td>
<td>Every 3-6 months</td>
<td>- More invasive with an incision in skin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Infection is rare</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Bleeding is rare</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Cannot easily adjust dose</td>
</tr>
<tr>
<td>Nasal spray</td>
<td>Nose</td>
<td>2-3 times/day</td>
<td>- Nasal irritation/congestion</td>
</tr>
<tr>
<td>Buccal tablets</td>
<td>Applied to gums</td>
<td>2 times/day</td>
<td>- Gum irritation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Seldom covered by insurance</td>
</tr>
</tbody>
</table>

**Monitoring**

Men on testosterone therapy need regular follow-up visits to monitor blood levels of testosterone, red blood cell count and PSA (prostate-specific antigen). A prostate exam may also be performed in men over age 40. Sometimes testosterone treatment needs to be stopped or the dose lowered if the blood cell count rises too high.

There is still spirited debate in medical circles over who needs testosterone replacement treatment, especially those who do not have laboratory-confirmed hypogonadism or certain medical conditions. Plus, the risks and benefits of taking testosterone for many years are not known, because large, rigorous studies haven’t yet been completed. While the perceived potential of testosterone therapy may seem enticing if you’re feeling tired or your libido is diminishing, there are a lot of misconceptions about what the treatment can and can’t do for you...and starting the therapy is a serious decision. Do so only on after receiving expert medical advice from a qualified physician.
To improve the health of people living with diabetes

Boehringer Ingelheim and Eli Lilly and Company are committed to researching and developing innovative treatments that make a difference for people affected by diabetes.
Do You Take Care of an Older Adult with Diabetes? Your Support Can Go a Long Way.

BY THE NATIONAL DIABETES EDUCATION PROGRAM

Diabetes occurs in people of all ages, but it’s more common in older adults. If you are taking care of an elderly loved one with diabetes, you can play an important role in helping them manage their disease. This is important because diabetes can lead to other serious health problems, such as heart disease, stroke and kidney disease.

It can be hard to make lifestyle changes to stay healthy. Support from family and friends such as offering to plan healthy meals can help. Help your loved one make healthy food choices that include fruits and vegetables, whole grains, and water or low-fat or nonfat milk products.

Being active most days of the week is an important part of staying healthy. It can help your loved one be more flexible, increase their strength and improve their balance. Find activities that you can do together, such as walking, dancing, or gardening. Start slow and work up to being active 30 minutes a day, five days a week.

You can also help your loved one cope with the everyday tasks of managing diabetes. Ask if you can help with reminders about doctor visits and encourage them to check their blood glucose (sugar) and take their medicine as prescribed by their healthcare team. Help your loved one write a list of questions for their doctor or healthcare team and attend appointments with them if you can. Ask the doctor about your loved one’s diabetes ABCs goals (A1C, blood pressure, cholesterol, stop smoking) and how to achieve these goals to prevent diabetes-related health problems. Insurance plans and Medicare can also cover some of the costs of their diabetes care.

Diabetes can be hard to handle alone. As a caregiver, your support goes a long way to helping your loved one cope with diabetes. Being a good listener and helping your loved one manage the stress of diabetes are often the most important things you can do to support them.

The following questions are good starting points:

- Do you ever feel down or overwhelmed about all you have to do to manage your diabetes?
- Have you set goals to manage your diabetes?
- Have you talked to your health care team about your diabetes care and how you want to reach your goals?
- What can I do to help? (Example: Are there things I can do to make it easier for you to live with diabetes? If you want to be more active, will it help if we take walks together?)

Visit the National Diabetes Education Program’s Diabetes Resources for Older Adults web page to find more tools to help you better understand the issues that affect diabetes in older adults.

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.
Diabetes mellitus is a condition characterized by alterations in the body’s metabolism of glucose (sugar) that result in elevated blood glucose levels. Diabetes is usually classified as being type 1 or type 2. In type 1 diabetes, the beta cells of the pancreas cannot make insulin, a hormone that allows your body to use sugar from carbohydrates in the food that you eat for energy or to store glucose for future use. In type 2 diabetes, the pancreas continues to produce insulin, but a cellular impairment causes insensitivity and inability to utilize insulin. The end result is elevated blood glucose levels in both diabetes types.

It is well known that diabetes is the leading cause of new cases of blindness, heart attacks, kidney failure, and leg and foot amputations among adults. However there are many other consequences of diabetes that you may not be aware of. In fact, evaluation of these conditions may also help diagnose underlying diabetes.

Hearing Loss
Did you know that diabetes is associated with hearing loss? U.S. data suggest that among persons with diabetes between the ages of 50 and 69 years, more than 70 percent have high-frequency hearing impairment and one third have low- or mid-frequency hearing impairment. High-frequency loss affects your ability to understand speech. You can hear vowel sounds, but cannot hear the sounds of the letters F, S, T and Z. You would also be unable to hear higher octaves, such as a woman’s or a child’s voice, or a bird chirping. Low- to mid-frequency hearing loss means having difficulty hearing conversation or picking out parts of conversation when you are in a group or a noisy environment. This affects the ability to hear all sounds, whether speech, phone conversations, or media such as TV.

The data also suggest that people with diabetes may experience hearing loss at earlier ages. This is due to damage to the blood vessels or the complex collection of nerves and specialized cells of the inner ear and may be a consequence of abnormal hardening of the internal auditory artery; damage to the protective covering of the cochlear nerve, which carries auditory sensory information from the cochlea of the inner ear directly to the brain; wasting away of the spiral ganglion, the group of nerve cells that serve the sense of hearing by sending a representation of sound from the cochlea to the brain; and loss of hair cells, the sensory receptors in the inner ear that detect sound and head motion to begin the processes of hearing and balance control. Optimal blood sugar (glucose) control may prevent premature hearing loss in those with diabetes.
Cognitive Decline

Another less-addressed and not as well-recognized complication of diabetes is cognitive (thinking ability) impairment. Cognitive impairment includes changes in memory, mood swings, ability to understand, reaction times, attention and concentration.

Recent studies have shown a link between type 2 diabetes and mild cognitive impairment and Alzheimer’s disease. Although the exact mechanism of cognitive dysfunction in diabetic persons is not clear, it is believed to be due to many potential factors. Lack of blood glucose control that results in low and/or high blood sugars is strongly associated with a decline in thinking ability. Small blood vessel (such as the small arteries in the brain) and large blood vessel changes (such as the carotid arteries that deliver blood from the neck to the brain) have been linked to type 2 diabetes, and these changes are believed to decrease blood flow to the brain as well as within the brain, potentially allowing the development of dementia. Optimal blood glucose control may slow this progression of loss of cognitive function.

Osteoporosis

Osteoporosis is a bone condition defined by low bone mass and decreased bone quality resulting in increased fragility and risk of bone fractures. Various studies have shown that patients with diabetes have lower bone mass and higher risk of fractures. And increasing evidence suggests that those with type 1 diabetes, in particular, may have an associated decrease in new bone formation possibly because of defective function of osteoblasts (bone-forming cells) due to autoimmune or inflammation-related chemical processes.

Some data suggests that poorly controlled diabetes with higher than normal blood sugars and subsequent increased osmolarity (electrolyte imbalance) may decrease the ability of bone-forming cells to function normally. In addition, those individuals that have type 1 diabetes are known to have lower levels of a bone-forming hormone called insulin-like growth factor, a hormone that maintains healthy bone formation. And lifestyle factors such as obesity and inactivity in type 2 diabetes seems to lead to low bone mass and increased risk of bone fractures.

(Continued on page 26)
**Little-Known Consequences of Diabetes**

(Continued from page 25)

**Diabetic Myonecrosis**

Diabetic myonecrosis (muscle death) is an uncommon finding associated with long-standing and poorly controlled diabetes mellitus. This muscle death may occur as a result of decreased blood flow to the muscles due to blockage of blood vessels or inflammation accompanied by clot formation in the vessels in muscle. The usual symptom of this condition is sudden onset of pain of the involved muscle, which appears red and swollen. You should contact your doctor promptly if you see a swollen and reddened muscle, as surgical care may be necessary. Some people just experience a deep pain in a muscle without seeing any changes. In this circumstance, an x-ray may be required to fully evaluate what is happening. Again, contact your doctor and/or diabetes care team to undergo testing needed to determine whether diabetes-related muscle injury might be a cause of your symptoms.

**Frozen Shoulder**

Frozen shoulder, also known as adhesive capsulitis or shoulder bursitis, is common in those with both type 1 and type 2 diabetes. In this condition, the shoulder becomes stiff and movement is limited. An estimated 20 percent of people with type 1 or type 2 diabetes can develop this, as compared to only 5 percent of the general population.

One theory about the condition is that glucose (sugar) molecules can stick to collagen, which is one of the building blocks of your ligaments and tendons and helps to hold your bones together in a joint, and that these molecules make the collagen thicker and less able to function as it should normally. This stickiness can result in more-than-normal deposits of collagen in cartilage and tendons of the shoulder. The resulting buildup then causes the affected shoulder to stiffen and limits motion. Anti-inflammatory drugs and physical therapy is usually the recommended treatment, but surgery may be necessary if there is no benefit from that course of treatment.

**Diabetic Mastopathy**

Diabetic mastopathy (inflammation of the breasts) is a condition characterized by the presence of tumor-like hard, irregular, easily movable, distinct and painless breast masses that are not cancerous. The condition has been reported in both women and men with long-standing type 1 or type 2 insulin-dependent diabetes. These tumor-like masses are believed to be caused by abnormal chemical responses to insulin and can be solitary or multiple and present in one or both breasts. The masses can be treated surgically for cosmetic reasons, but tend to regrow in uncontrolled diabetes.

**Recurrent Respiratory Infections**

Having diabetes is one of the most common contributors to developing frequent respiratory infections, with influenza (flu) and streptococcus (strep) pneumonia being more common. If you have diabetes, you are six times more likely to be hospitalized during flu epidemics than if you don’t. The American Diabetes Association (ADA) and the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices recommend anti-pneumococcal and influenza vaccination for people with diabetes. These vaccines reduce the number of respiratory infections, the number and length of hospitalizations, the deaths caused by respiratory tract infections, and the consequent medical expenses related to the treatment of influenza and pneumonia.

**Emphysematous pyelonephritis**

It is relatively common knowledge that people with diabetes are at increased risk for developing urinary tract infections. Diabetes is also a major risk factor for a condition called emphysematous pyelonephritis, which results in necrosis (process of dying of a tissue) of kidney tissues accompanied by the formation of gas from bacteria involved in the urinary tract or around the kidneys. This condition can be life-threatening and is characterized by fever, chills, back pain, nausea and vomiting. Treatment requires administration of antibiotics, fluids (usually both intravenously in a hospital) and getting blood sugars under control.
Skin Infections / Eruptive Xanthomatosis / Digital Sclerosis

Several kinds of bacterial infections can occur more frequently in people with diabetes. These include styes (infections of the glands of the eyelid), boils, folliculitis (infections of the hair follicles), carbuncles (deep infections of the skin and the tissue underneath), and infections around the nails.

Those with diabetes are especially prone to fungal infections, which is often caused by Candida albicans. This yeast-like fungus causes itchy rashes that occur in warm, moist folds of the skin such as under the breasts, between fingers and toes, and in the armpits and groin area. Other fungal infections include athlete’s foot, ringworm (a ring-shaped itchy patch), and vaginal infection that causes itching. If you think you have a yeast or fungal infection, call your doctor.

Eruptive xanthomatosis (zan’thō-mā-tō’sis) is yet another skin condition caused by uncontrolled diabetes. It is associated with high triglycerides (sugar fats) and can be an initial sign of diabetes that has been undiagnosed. It causes firm, yellow, pea-like enlargements that may have a red halo and may itch. The condition occurs most often on the backs of hands, feet, arms, legs and buttocks. Also frequently causing an inflammation of the pancreas, eruptive xanthomatosis often requires insulin use be started promptly.

Digital sclerosis can occur with diabetes. The condition causes development of tight, thick, waxy skin on the backs of hands, toes and the forehead, resulting in joint stiffness and limited movement.

Dental Disease

Diabetes is one of the risk factors for periodontitis, a serious gum disease that damages the soft tissue, destroys the bone that supports your teeth and can cause tooth loss. And it may make the infection worse if your diabetes is uncontrolled. Research has further suggested that the bacteria responsible for periodontitis can enter your bloodstream through your gum tissue and affect your lungs, heart and other parts of your body, triggering a cycle of inflammation that contributes to heart attacks.

Mauriac syndrome

Mauriac syndrome is characterized by small stature, obesity and an enlarged liver in patients with insulin-dependent diabetes. It is typically associated with poorly controlled type 1 diabetes and is manifested by growth failure and delayed pubertal development. These complications are known to be reversed with good glycemic control.

Despite the varied consequences with each of these conditions, the first line of defense to avoid these complications is to maintain tight control over your blood glucose. By doing so, you increase the odds of reducing these less-common complications of diabetes.
Your Diabetes &
Thyroid Disease &
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• Healthy eating and physical activity may not be enough to maintain your weight

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The American College of Endocrinology (ACE) and the American Association of Clinical Endocrinologists (AACE) would like to thank AbbVie, Boehringer Ingelheim, Lilly Diabetes and Novo Nordisk Inc. for their support of the EmPower initiative.