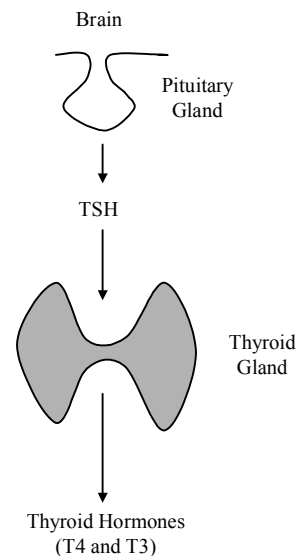


# GRAVES' DISEASE – PATIENT INFORMATION

## WHAT IS THE THYROID GLAND AND WHAT DOES IT DO?

- The thyroid is a butterfly-shaped gland that straddles the trachea (windpipe) in the neck.
- The thyroid makes 2 hormones that are released into the blood to control many of the body's systems and functions. The thyroid hormones are called T3 and T4.
- The thyroid is controlled by the pituitary gland. This gland is located underneath the front part of the brain, behind the eyes, and it controls the body's production of several hormones. It controls the thyroid by releasing a hormone called TSH (thyroid stimulating hormone), which tells the thyroid to release T3 and T4 to act on the body. The pituitary can sense how much thyroid hormone is in the blood, and can adjust the signal to the pituitary gland to keep the hormone levels normal (very similar to how the thermostat can sense how much heat is in your home, and can adjust the signal to the furnace to keep your home at the right temperature).
- Problems with the thyroid gland affect either the function of the thyroid, the structure of the thyroid, or both. Problems with the function include *hyperthyroidism* (overactive thyroid) and *hypothyroidism* (underactive thyroid). Problems with structure include *goiter* (enlarged thyroid) and *nodules* (abnormal lumps in the thyroid).



## WHAT ARE THE SYMPTOMS OF HYPERTHYROIDISM?

- Overactive thyroid can cause many symptoms. These include fatigue, weight loss (or rarely weight gain), poor sleep, palpitations (sense of heart racing or beating strongly), tremor or shakiness, excessive sweating, intolerance to hot temperatures, difficulty concentrating, restlessness, nervousness, weakness, light menstrual periods or missed menstrual periods, and increased frequency of bowel movements or diarrhea.
- People with Graves' disease may also have eye problems. These include scratchy or dry eyes, blurred vision, double vision, pain behind the eyes, pain when the eyes move, and loss of vision.
- Keep in mind that not every person with hyperthyroidism will have every symptom, and that not everyone with these symptoms has hyperthyroidism.

## WHAT IS GRAVES' DISEASE?

- Graves' disease is a specific type of hyperthyroidism caused by the body's immune system. The body makes antibodies that react with the thyroid and cause it to release extra thyroid hormone. The thyroid is no longer controlled normally by the pituitary gland.

## HOW IS HYPERTHYROIDISM DIAGNOSED?

- The TSH and thyroid hormone levels (T4, T3) can be measured in the blood. In most cases, the TSH is the best marker of whether the thyroid hormone levels are normal or abnormal. If the TSH is abnormal, then the T4 and/or T3 are usually measured.
- In hyperthyroidism, the TSH is below normal, as the pituitary gland is trying to signal the thyroid that it does not need to release more thyroid hormone. The T4 and T3 levels may be high or normal.
- A blood test can also determine if there are antibodies in the blood that are affecting the thyroid. These antibodies are often present in Graves' disease. However, these tests are not always needed to be certain of the diagnosis.
- If you have hyperthyroidism, your doctor may ask you to have a special x-ray test performed, called a thyroid scan and uptake, to help determine whether the overactive thyroid is caused by Graves' disease or another condition.

## WHAT ARE THE TREATMENT OPTIONS FOR GRAVES' DISEASE?

**Radioiodine.** Radioiodine (also called radioactive iodine) is given as a capsule or liquid that you swallow. It gets concentrated in the thyroid gland where it destroys the overactive thyroid tissue over several weeks or months.

- People sometimes are concerned about a "radioactive" treatment. Radioiodine has been used for many decades and has proven to be safe. The actual dose of radiation is quite low, and is similar to the dose of radiation from special x-

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ray tests like a barium enema or intravenous pyelogram (special x-rays of the colon and kidneys). The long-term risks for birth defects, infertility, or cancer are not increased compared to people who have not received radioiodine.

- Women cannot be pregnant or breast-feeding when they receive radioiodine. It may be necessary to have a pregnancy test to be absolutely sure you are not pregnant before you receive radioiodine.
- Because the radioiodine also enters the urine, you will be asked to follow several precautions for a few days, like flushing the toilet 2 or 3 times after urinating and avoiding close contact with other people.
- A small number of people treated with radioiodine will continue to have hyperthyroidism. If this happens, a second dose can be given, or a different treatment can be used.
- Most people treated with radioiodine will eventually develop hypothyroidism, or underactive thyroid, which is easily treated by taking a thyroid hormone pill once per day.
- If you have eye problems related to your Graves' disease, these can potentially worsen after radioiodine. The risk is higher if you are a smoker or have increasing eye symptoms. Your doctor may not want you to receive radioiodine or may discuss special treatment to prevent worsening eye problems.

Anti-thyroid medications. These include methimazole (Tapazole®) and PTU (propylthiouracil), which work by blocking the ability of the thyroid gland to make thyroid hormone.

- Medications are initially used for 12-24 months to control the hyperthyroidism. During this time the dose is adjusted every month or two, based on your symptoms and blood test results. After 12-24 months, about 30% of people will enter remission, meaning that when the medication is stopped, the hyperthyroidism does not return (although sometimes it may come back months or years later). Your chance of entering remission is better if you have mild hyperthyroidism, are older than age 40, are a woman, or have a small thyroid gland.
- About 10% of people will have side effects from these medicines. Common reactions are rash, itching, joint pains, nausea, or jaundice (yellow skin). You should let your doctor know if you develop any new or worsening symptoms while taking one of these medicines.
- Very, very rarely these medicines can cause the body to stop making white blood cells, which fight infection. This can be very serious if it does occur. *If you develop fever above 100 F or sore throat while taking one of these medications, please stop the medicine and notify your doctor so you may have a blood test to check your white blood cell count.* The medicine can be restarted as soon as the white blood cell count is found to be normal.

Surgery. An operation to remove most or all of the thyroid gland can control the hyperthyroidism, but is usually not performed in Graves' disease except in special circumstances. Please ask your doctor if you would like to learn more about surgery as an option for therapy.

Beta-blockers. Beta-blockers are medicines that can help control the symptoms of hyperthyroidism until one of the other treatments can control the overactive thyroid gland. Beta-blockers may be prescribed in combination with one of the other treatments discussed above.

## HOW WILL I BE MONITORED DURING AND AFTER TREATMENT?

- Monitoring depends on the specific treatment given, but in general blood testing is performed initially every 1-3 months to monitor the TSH and thyroid hormone levels.
- If you develop symptoms of hypothyroidism your doctor may want you to have blood tests performed sooner. You should let your doctor know if you have symptoms like worsening tiredness, new muscle aches, constipation, weight gain, or difficulty tolerating cold temperatures.

## SPECIAL CONSIDERATIONS ABOUT GRAVES' DISEASE AND PREGNANCY

- If you are pregnant and have Graves' disease, you will likely be treated with PTU as a first choice for therapy. For some women Graves' disease gets better during pregnancy. Graves' may get worse after delivery.
- If you are breast-feeding, you should talk with your doctor about the options for therapy.
- If you have been treated with radioiodine and later become pregnant, you should make sure your doctors know about your diagnosis of Graves' disease. Even though you may no longer be hyperthyroid, the antibodies in your blood can still potentially affect the baby. It is important that your baby have appropriate monitoring. Fortunately, any effects on the baby are usually mild, are easily treated, and go away quickly.