Your doctor has referred you to Nuclear Medicine for treatment of your overactive thyroid gland. This handout will address the questions asked most often or concerns that patients have about this procedure. We hope that this will be helpful.

As always, if you are a UW Health patient and have any questions discuss them with your doctor or one of our Nuclear Medicine doctors. We will be happy to discuss any concerns you may have.

What Is the Thyroid?

The thyroid is a small, butterfly-shaped gland found just below the Adam's apple. Its main function is to control the body’s metabolism. It also makes thyroid hormones which travel throughout the body.

What Is Thyrotoxicosis?

Thyrotoxicosis occurs when too much thyroid hormone is released by the thyroid gland. This can cause a number of symptoms, such as weight loss, nervousness, trouble sleeping, tremor of the hands, trouble coping with heat, increase in number of bowel movements, and fast heart rate (pulse).

What Can Cause Thyrotoxicosis?

There can be many causes. The most common cause is Graves’ disease (an autoimmune disease). Other causes include: overactive thyroid nodule(s) and thyroiditis (inflamed thyroid). There are lab and Nuclear Medicine tests that can help your doctor decide what caused your thyrotoxicosis.

What Blood Tests Will My Doctor Use?

The most common blood tests are those that measure the levels of certain thyroid hormones in your blood. These include the thyroid hormones (T4, a thyroid hormone with four iodines attached, and T3, three iodines attached) and thyroid stimulating hormone (TSH). TSH is made in the pituitary gland in the brain. It is released into the blood. Its job is to cause the thyroid to make thyroid hormone. If there is too much thyroid hormone in the blood, then the pituitary will release less TSH. If there is too little thyroid hormone in your blood, the TSH will rise.

What Is the Radioactive Iodine Uptake Test?

The radioactive iodine uptake test is a method of finding out how your thyroid gland is working. Iodine is a crucial building block for thyroid hormone and the thyroid
gland will take it up from the blood. In the uptake test, a small test amount of radioactive iodine is given by mouth, and the amount which is taken up by the thyroid is measured 24 hours later. Radioactive iodine is concentrated inside thyroid cells exactly as normal iodine, and can be used to diagnose and treat thyroid problems. This will confirm thyroid function, and establish if your thyroid gland is overactive (hyperthyroid) and needs treatment.

**How Can Hyperthyroidism Be Treated?**

The method of treatment may depend on the cause of the hyperthyroidism. There are two common forms of treatment. These are medicines (antithyroid medicine with or without beta-blockers) and definitive treatment (radioiodine therapy or surgery).

**What Medicines Are Used?**

Antithyroid medicines prevent thyroid hormone from being produced, but do not treat the real cause for the overproduction of the hormone. There are two such medicines, propylthiouracil (PTU) and methimazole (Tapazole®).

Beta-blocker medicines "block" the effect of the thyroid hormones on the body, which in turn will reduce the symptoms of having too much thyroid hormone. They do not affect the thyroid gland itself or reduce the levels of thyroid hormone in the blood.

**What Is Definitive Treatment?**

Definitive treatment for hyperthyroidism will remove or destroy part of the thyroid gland, so that the total amount of thyroid hormone released will decrease. This can be done by giving radioiodine or by surgery. In most cases, radioiodine treatment is easier and preferred over surgery.

**How Does Radioactive Iodine Work?**

Iodine is taken up by the thyroid gland. One form of iodine, iodine-131, is radioactive and can be used to treat hyperthyroidism. The radioactive iodine enters the thyroid gland and while being made into thyroid hormone, it destroys some of the cells. This will reduce the size of the gland as well as its action to produce too much thyroid hormone. An attempt is made to give an amount of radioiodine which will reduce the amount of thyroid hormone produced to normal levels, and cure the hyperthyroidism. Radioactive iodine that is not taken up by the thyroid gland exits the body through the urine, sweat, saliva, and bowel movements.

**How Long Does It Take to Feel Better After Radioiodine?**

Your symptoms should begin to improve by one month after treatment and the full effect is often complete by six (6) months. Sometimes, the treatment will need to be repeated. This happens in about 10-20% of patients. Sometimes too much radioiodine is given and a low thyroid state (hypothyroidism) can occur. This also occurs in 10-20% of patients in the first year and many more patients will become hypothyroid within the next 10 years after treatment. This is easy and safe to treat.

**Is Radioiodine Treatment Safe?**

This treatment has been used for over 60 years and is a safe and effective method of treating patients with hyperthyroidism. You may have concerns about treatment with radioactivity and the chances of getting leukemia or thyroid cancer. All studies which have been done to date show no increased risk of these cancers with this treatment.
A very rare effect of radioiodine or surgical therapy, called thyroid storm, may occur within the first week after treatment. This can happen if there is a sudden release of a large amount of hormone from the thyroid gland. This will produce a very high heart rate (above 130 beats per minute) and a high fever (above 103°). If this happens to you, you should contact your doctor or an emergency room at once. This is a very rare side effect of radioiodine treatment, but is easy to treat.

What about Hypothyroidism?

Hypothyroidism, the reverse of hyperthyroidism, occurs when not enough thyroid hormone is produced. When this happens, T3 and T4 are low in the blood while TSH is higher than normal. This is common after treatment with radioactive iodine or surgery, and can even occur without these treatments in Graves’ disease. For adults, the chance of hypothyroidism is at least 10-20% within the first year. In Graves’ disease, there is a 1-2% chance of hypothyroidism each year after.

The symptoms of hypothyroidism are vague. You may feel a little bit tired, a little weak or a little depressed. Therefore, you must see your doctor each year and be tested (with a blood TSH test) to see if you have become hypothyroid.

A simple and useful treatment for hypothyroidism is to replace the thyroid hormone by taking a pill each day. Thyroid pills are not costly and are made in many strengths. Your doctor will order the exact amount of replacement hormone you need to treat the problem.

What Safety Measures Should I Take After Treatment?

Most of the radioiodine that is not taken up in your thyroid gland will leave your body within two days. It is mostly removed in your urine, but some is also removed in saliva, sweat and through the bowel.

- No food or drink for one hour after the treatment.
- Drink lots of fluid after this hour, and for the next 24 hours, trying to pass urine each 1-2 hours.
- Try to have at least one bowel movement per day.
- If accidents happen and you soil your clothing or bedding with urine, then wash these items (in washing machine) alone without any other clothes.

Radiation Safety Measures for Others

The dose of radioiodine used to treat hyperthyroidism is small and people around you are at very low risk from the radiation. Pregnant women and small children are more sensitive to radiation. There are a few things that you can do in the first three to four days to lessen any needless radiation exposure to others. The three basic guidelines to avoid radiation exposure to others are increase your distance from them, reduce the time you spend near people, and practice good hygiene, mainly washing hands after using the toilet.

- Do not return to work until ______ days time.
- Limit your time in public places.
- Do not travel by airplane or long car trips for two days.
- Maintain an arm’s length distance from other people if you will be with them for a long time. We will show this to you; radiation exposure drops
off quickly with distance. Even an arm’s length distance can reduce doses that other people receive by 10-30 fold. Follow these guidelines for 3-4 days.

- Do not carry baby using the shoulder carry for 5-6 days.
- Flush the toilet twice after using it. Rinse under the rim of the toilet with a brush, and then refill. Use a different toilet from others at home if you can.
- Avoid sharing eating utensils, above all with children. After use, you can wash utensils as usual.
- Sleep alone in bed for 2 days. Sleeping in a separate room is best
- Avoid close contact with children and pregnant women.
- If you think you are pregnant, tell your doctor because radioiodine should not be given to pregnant women.
- Radioiodine will show up in breast milk. Tell your doctor if you are breast-feeding.
- Avoid becoming pregnant or fathering a child for at least 6 months after therapy.

The above guidelines are of a general nature. We will discuss your own case with you at the time of treatment. You will most likely see your doctor in 6-8 weeks, then at 3-4 monthly intervals from the time of treatment for a year, and then you should have yearly TSH blood tests.

**Frequently Asked Radiation Questions**

**Can I keep breast feeding?**

Absolutely not! The radioiodine absorbed by a breast feeding infant can lead to permanent thyroid gland problems. External exposure that results from being close to the mother’s thyroid gland during breast feeding is also a problem. Therefore, breast feeding must be stopped at the time of the mother’s radioiodine treatment. Nursing may resume after the birth of your next child.

**I am still lactating. Is that a problem?**

Yes, a big one! The radiation dose to the lactating breast can be large - as much as 10 times the dose to the nonlactating breast. Lactation must be fully ended prior to treatment. If you abstain from nursing for 2-3 months prior to treatment, we can be sure that lactation (and the ability of the breast to concentrate large amounts of iodine) doesn’t increase your radiation exposure.

**I have children at home? What should I do?**

Plan to limit contact with them for 48 hours, and sometimes longer when large doses are used, or the children need a lot of cuddling. Always keep in mind the “arm’s length rule”. To resist the temptation of children coming close to you during this time, it is best to make plans for the children to spend most of this time with other family members.

**I am planning on staying at a hotel for a few days just to play it safe. What do you think?**

We strongly advise you not to do this. Although reassuring to your loved ones, this will expose the public (housekeeping staff and other hotel patrons) to radiation. We know that the toilet you use will expose others to radiation since the most of the radioiodine is passed through the urine. This is why we advise you to use your own bathroom for a few days and avoid using public bathrooms.
How long should I wait to get pregnant after having radioiodine treatment?

We advise you to wait at least 6 months.

Do I need any tests prior to treatment?

Hospital policy mandates a pregnancy test on the day before or the day of treatment for all women of childbearing age.

I don’t need a pregnancy test because my husband had a vasectomy, right?

Wrong! Please refer to the answer above.

How do all these radiation safety measures apply to pets?

Treat them as people or, better yet, children. Their thyroid glands are much more sensitive than adult human thyroid glands, so besides the “arm’s length rule,” we also advise you to limit holding your pets for 48 hours.

I heard that radiation can set off airport security alarms. Does this concern me?

Yes! In this time of heightened terrorism alert, you should know that I-131 can set off airport alarms for a few weeks after treatment. If you intend to travel, ask us to provide a letter to take with you just in case you set off an alarm.

Any Further Questions?

We have tried to answer many of the common questions which patients have about hyperthyroidism and radioiodine treatment. If you are a UW Health patient and have any other questions or concerns, we will gladly help you with them. You can reach us at (608) 263-1462.

If you are a UW Health patient and live out of the area, call 1-800-323-8942. Ask for the Nuclear Medicine Clinic.