

Graves' Disease
Division of Pediatric Endocrinology and Diabetes
Stanford University School of Medicine

Introduction

You (or your child) have been diagnosed with a condition called hyperthyroidism or Graves' disease. This is a condition in which your immune system produces antibodies that stimulate your thyroid gland to make too much thyroid hormone. The condition is diagnosed when the blood levels of thyroid hormones (called T4 and T3) are too high and the regulating hormone (called TSH) is suppressed. There are medical and surgical treatments for this condition.

Symptoms of Hyperthyroidism

You (or your child) may have some or all of the following symptoms and signs until the hyperthyroidism is controlled:

- Weight loss
- Rapid heart rate and palpitations (feeling like your heart is racing)
- Frequent bowel movements
- Increased appetite
- Nausea or abdominal pain
- Nervousness and mood swings
- Insomnia
- Difficulty with concentration and memory
- Decline in school performance
- Prominent eyes
- Goiter (enlargement of the thyroid gland)

These symptoms can be serious. Until the Graves' disease is controlled, it is not safe to participate in vigorous activities like p.e., running, soccer, or dance. Your doctor can provide you a note for school to excuse you from p.e. and to explain how the hyperthyroidism may interfere with school performance. These symptoms will improve if the medicine is taken on a regular basis.

Medical Treatment

The first line of treatment is to reduce the production of thyroid hormones in the body by use of medications called methimazole or propylthiouracil. These drugs must be taken as directed, usually three times a day (breakfast, afternoon and bedtime). The dose of the medicine is adjusted according to symptoms and lab tests. At the start of treatment, blood tests are done every month; later they are spaced out to every three months. Once the condition comes under control, we may lower the dose of the PTU or methimazole to avoid hypothyroidism (where thyroid levels are too low). Our usual course of treatment is two years.

If the symptoms of the fast heart, nervousness, or insomnia are severe at the start of the illness, a second drug called propranolol may be prescribed as well. Propranolol is used to help with the symptoms of hyperthyroidism and will be stopped in a few weeks once the thyroid hormone levels decrease.

Blood tests and doctor visits will be done at the following times:

- At diagnosis (when treatment is started)
- One month after starting the medicine
- Two months after start
- Three months after start
- Then every 3 months for 2 years
- More tests or visits may be needed if there are new symptoms or if the dose of the PTU or methimazole is changed.

Side Effects of Methimazole or PTU

Most patients will do fine on these medicines but there are some side effects you should know about:

- **Rash** – typically within a few days after beginning the medicine. It is usually small red bumps, often over much of the body, and may be itchy. **CALL** your doctor if this occurs and we will decide if we need to stop the medicine
- **A metallic taste in the mouth** – This is not serious and often improves with time.
- **Stomach upset** – mild abdominal pain or nausea can occur with the hyperthyroidism or the medicine used to treat it. Typically it gets better as you continue to use the medicine
- **Low white blood count** – Rarely these medicines can reduce the number of white blood cells needed to fight infection. This can happen at any time during treatment. **If you (or your child) develop a fever or sore throat while taking PTU or methimazole, contact your doctor immediately** and get a blood test to check the white blood cells (a test called a CBC)
- **Jaundice and liver disease** – Rarely these medicines cause liver problems which can cause yellowing of the skin or the whites of the eyes as well as abdominal pain. We will check liver function routinely during treatment but you should see your doctor if you notice new symptoms.
- **Arthritis** – Rarely these medicines can cause joint pains and a skin rash on the face. Contact your doctor if you are concerned about these symptoms.

The Overall Treatment Plan

- **A full course of medical treatment with methimazole or PTU is usually 2 years.** If things are then under good control, the medicine will be stopped to see if relapse occurs. However, alternative treatments with radioactive iodine (¹³¹I) or surgery can be a reasonable alternative at any time once the symptoms of hyperthyroidism are under control.
- **Hyperthyroidism returns in about 70% of children** within 2 years after stopping PTU or methimazole. Relapse is most common in the first six months post treatment. The risk of a relapse is higher in young children, in those with higher thyroid hormone levels or more symptoms pretreatment, in those with higher levels of thyroid antibodies, in non-Caucasians, and in those who do not remain well controlled on the thyroid medicine.
- Some families will choose **surgery** or **radioactive iodine** instead of finishing two years of methimazole. Others make this choice if a relapse occurs after two years of medicine. Surgery or RAI must be performed if there are side effects that prevent use of methimazole or PTU.
- **Radioactive iodine (RAI)** is a type of medical treatment where radioactive medicine is given (as a drink) which will destroy the thyroid gland. This is considered a safe type of treatment in children and teens. After RAI, thyroid replacement (thyroxine) is needed to treat hypothyroidism. This is a once a day pill with no side effects. Thyroid levels are checked every 6 – 12 months.
- **Thyroid surgery** removes the thyroid gland. Surgery is associated with risks from anesthesia and the surgery itself. Surgery also causes hypothyroidism (requiring thyroid hormone replacement for life).

Contact Information:

- Pediatric Endocrinology Office Phone (650) 721-1811.
- Emergency After Hours (650) 497-8000 – Page the Pediatric Endocrinologist on Call.