

A small number of people who take thionamides have a serious side-effect called agranulocytosis. This means that the white blood cells that fight infection decrease in number, making it easy to get infections. This could be **life-threatening**. If your child has a sore throat and/or fever, it is important that he or she gets a throat swab and blood test done to check the white blood cell level. If the white blood cell count is very low, then your doctor may tell you to stop the medicine. Another treatment for hyperthyroidism may have to be used (see numbers 2 and 3).

## 2. Radioactive iodine ablation (destruction) of the thyroid gland

Iodine in our diet is normally used by the thyroid gland to make thyroid hormones. With the ablation procedure your child drinks a certain amount of radioactive iodine. Like iodine, the radioactive form is also trapped in the thyroid gland, but the radioactivity destroys the thyroid cells. Most of the radioactive iodine leaves the body in the urine several days after the treatment.

Measures are taken during this time to limit the exposure of others (especially young children and pregnant women) to radiation.

Levels of thyroid hormones decrease over weeks or months after the treatment. Your child may become hypothyroid after this treatment. This is a life-long condition and can be easily treated with a pill, taken a day for life to replace the thyroid hormones.

## 3. Thyroid surgery

Hyperthyroidism can be treated by an operation to remove part of the thyroid gland. Anti-thyroid drugs are usually given for a few weeks before surgery to decrease the activity of the thyroid gland.

There is a risk after surgery of:

- paralyzed vocal cord
- bleeding
- infection
- the body having trouble regulating calcium (because of damage to the parathyroid glands)

Like the ablation procedure, your child will become hypothyroid after surgery. This means your child would need to take a thyroid hormone replacement pill once a day for life.

### Important Safety Information

However the hyperthyroidism is treated, your child will need to be careful while in the hyperthyroid state. Because your child's heart rate and blood pressure may already be quite high, anything that would make it even higher should be avoided. This includes strenuous physical activity, including physical education classes at school. Sometimes, a medicine to decrease the fast heart rate and high blood pressure is prescribed.

Take these precautions until the doctor says it is safe for your child to return to his or her usual level of activity (when the levels of thyroid hormones are closer to normal).

If you would like to learn more, ask the clinic for websites.

health information

# Hyperthyroidism in Children

## What is hyperthyroidism?

Hyperthyroidism is when there is too much thyroid hormone in the body. Thyroid hormones are made by the thyroid gland, which is in the neck. It makes two hormones:

- thyroxine (T4)
- triiodothyronine (T3)

T3 and T4 control the rate of the body's metabolism (they are like the body's motor).

The brain controls the amount of T3 and T4 made by the thyroid gland. The **pituitary gland** in the brain releases thyroid stimulating hormone (TSH), which tells the thyroid gland to release T3 and T4.

If the body makes enough thyroid hormones, a chemical message is sent to the brain and less TSH is made. If the level of thyroid hormones is low, then the pituitary will release more TSH, causing the thyroid to release more T3 and T4. When this system works well, the levels of thyroid hormones in the blood stay normal.

## What causes hyperthyroidism?

1. **Graves' disease:** It is the most common cause of hyperthyroidism in children. It affects girls 3 to 6 times more often than boys. Graves' is an autoimmune disease. The body makes an antibody called thyroid stimulating immunoglobulin. This antibody causes the thyroid gland to always stay on. This means too much T3 or T4 is made.
2. **Inflammation of the thyroid gland (thyroiditis):** It can cause periods of hyperthyroidism. Over time, affected children often develop a shortage of thyroid hormone (hypothyroidism).
3. **Thyroid lump/nodule:** These rarely cause problems.

Hyperthyroidism often runs in families. There is nothing you could have done differently to prevent hyperthyroidism in your child.

## What changes are seen in children with hyperthyroidism?

Hyperthyroidism often happens slowly over time. Parents may look back once the diagnosis is made and remember that their child:

- had trouble with schoolwork or that school marks dropped in the last few months
- had trouble concentrating (sometimes mistaken for Attention Deficit/Hyperactivity Disorder)
- was irritable
- was more hungry (with or without weight loss)
- had more bowel movements
- was shaky or had tremors
- was sensitive to heat (sweat more than usual)
- had trouble sleeping (Daytime naps may have been needed because of poor sleep at night.)
- had a change in menstrual periods (if a girl)
- was weaker or didn't tolerate exercise as well

## How is hyperthyroidism diagnosed?

The doctor may suspect hyperthyroidism after asking you some questions about your child. When examining your child, the doctor may notice your child has:

- shaky hands or tremors
- a fast heartbeat
- an abnormal blood pressure
- very smooth and warm skin
- fine hair
- eyes that stick out
- an enlarged thyroid gland (goiter)

A blood test will tell the doctor if your child is hyperthyroid. The thyroid hormones are measured along with TSH. Thyroid antibody levels may also be tested. A special x-ray may be done to give more information about the thyroid gland.

## How is hyperthyroidism treated?

There are three ways to treat hyperthyroidism.

### 1. Thionamides (anti-thyroid drugs)

PTU (propylthiouracil) and methimazole belong to a group of drugs called thionamides. Thionamides stop T3 and T4 from being made. These pills are taken 1 to 3 times per day. They should lower the level of thyroid hormones within 2 to 3 weeks.

Most people can expect to take thionamides for at least 18 to 24 months. Up to 1/3 of these people may be cured and can stop taking anti-thyroid drugs after a period of time. The others will stay on thionamides long-term or until they choose another treatment.

Sometimes, the doctor will choose to give a high enough dose of thionamides to cause low levels of the thyroid hormone (hypothyroidism) and then replace the missing thyroid hormone with thyroxin (a drug used to replace thyroid hormone). This is usually done for people whose hyperthyroidism is very hard to control.

If your child has a **rash, joint pain, fever, or itchy skin**, it might mean that he or she is allergic to the anti-thyroid drug. If this happens, another anti-thyroid drug or treatment is used. Some children may develop liver problems.