



# British Society for Paediatric Endocrinology and Diabetes

## **GRAVES' DISEASE (hyperthyroidism, thyrotoxicosis) IN CHILDHOOD**

### **Cause**

Overactivity of the thyroid gland is rare in childhood but increases in frequency into young adult life, affecting girls more than boys. It is nearly always due to Graves' disease, now recognised to be an "autoimmune" condition, in which antibodies (proteins circulating in the blood whose usual function is to protect against infection) react with the body's own organs causing damage or, in this condition, stimulation. The cause is not known but it is clear that some people are genetically more susceptible than others. Similar antibodies may cause underactivity of the thyroid (sometimes called Hashimoto's disease) and both conditions can occur in the same family.

### **Symptoms**

The overstimulated thyroid gland produces too much of the hormone thyroxine (a circulating chemical compound that affects cells elsewhere in the body) which in turn has the effect of accelerating chemical processes in most of the cells of the body. The affected child may become anxious, nervous, restless with disturbed sleep and have difficulty concentrating at school. The pulse may race with an increased appetite, weight loss, excessive sweating, tremor and diarrhoea. Because the onset of the symptoms is gradual and the pattern is variable, some form of psychological disturbance may be suspected before the true problem is identified. The thyroid gland in the front of the neck becomes enlarged in some people and the eyes may become more prominent.

### **Diagnosis**

Once suspected, hyperthyroidism is easily confirmed by checking the thyroxine and the thyroid stimulating hormone level (TSH) in the blood.

### **Treatment**

There are three methods of treatment available:

#### **1. Drugs**

The major drug prescribed to reduce the secretion of thyroxine is Carbimazole although very occasionally the drug Propylthiouracil is used. Carbimazole is generally well tolerated but can produce side effects in about 5% of children; these are usually just skin rashes but severe effects on blood cells have occurred. For this reason if any acute infection or fever occurs in a child on treatment, then the blood count should be checked the same day and the Carbimazole or Propylthiouracil only started again when a low white blood cell count has been excluded.

#### **2. Surgery**



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The thyroid gland can also be removed by an operation. This is best undertaken by surgeons who do this operation regularly and hence who are very good at it. Thyroid hormone replacement (a daily tablet) will then be needed in the long term to replace what the thyroid gland is no longer making.

The operation leaves a visible scar in the neck although this tends to fade with time. Potential complications of the operation include damage to the nerves controlling the larynx (voicebox) or to the parathyroid glands which lie just behind the thyroid. Damage to the parathyroid glands may require treatment with calcium and /or vitamin D in the short or longer term.

### 3. Radioiodine

A radioactive isotope of iodine ( $^{131}\text{I}$ ) can be given by mouth as a tablet or in a watery solution. This is then concentrated by the thyroid gland and gradually destroys the secreting cells. This form of treatment is simple and has an excellent safety record (after many years use) but it does inevitably destroy the function of the gland so thyroid underactivity (hypothyroidism) develops and lifelong thyroxine replacement is again needed.

### Outlook

For children and adolescents we generally recommend a course of treatment with carbimazole at first to control the thyroid overactivity. Carbimazole is either given alone or in combination with thyroxine. If it is well tolerated then the medication is usually continued for two to three years because there is a chance (about 20%) that the disease may recover spontaneously within that time. If hyperthyroidism recurs when the treatment is stopped then drug treatment can be resumed for a further period although some people will choose to have surgery or radioiodine at that stage.