Hyperthyroidism

(Graves' Disease; Overactive Thyroid)

by Editorial Staff And Contributors

En Español (Spanish Version)
More InDepth Information on This Condition

Definition

Hyperthyroidism develops when the thyroid gland becomes overactive and produces too much thyroid hormone. The thyroid gland is a butterfly-shaped gland in the front of the neck. It produces hormones called T3 and T4. They control the body's metabolism.

The Thyroid Gland

Causes

Hyperthyroidism may be caused by:

- Graves' disease—Immune system produces antibodies that cause the thyroid gland to overproduce thyroid hormone
- Thyroid nodules:
  - Toxic uninodular goiter—a single area/nodule in the thyroid gland is overactive
  - Toxic multinodular goiter—multiple nodules in the thyroid gland which overproduce thyroid hormone
- Thyroiditis:
  - Autoimmune thyroiditis—inflammation of the thyroid gland which leads to spillage of thyroid hormone into the bloodstream (may later leads to hypothyroidism)
  - Subacute thyroiditis—inflammation of the thyroid gland (often later leads to hypothyroidism)
- Taking too much thyroid hormone—very rarely from meat sources contaminated by animal thyroid glands

Risk Factors
These factors increase your chance of developing hyperthyroidism:

- Sex: female (eight times more common in women than in men)
- Age: between 20-40 years old
- Pregnancy: postpartum thyroiditis (hyperthyroidism followed by hypothyroidism)
- Family history of Graves' disease
- Certain viral infections
- Smoking

Tell your doctor if you have these risk factors.

**Symptoms**

Symptoms come on slowly. They may be mistaken for stress. As the thyroid becomes more overactive, symptoms may include:

- Unexplained weight loss despite an increased appetite
- Heart palpitations
- Increased number of bowel movements/diarrhea
- Restlessness
- Tremors
- Fatigue
- Changes in libido
- Muscle weakness and wasting, especially in the elderly
- Heat intolerance
- Enlarged thyroid gland (goiter)
- Increased sweating
- Nervousness
- Irritability
- Lumpy, red thickening of the skin in front of the shins
- Shortness of breath
- Irregular or no menstrual period
- Heart failure or atrial fibrillation, especially in the elderly

**Diagnosis**

The doctor will ask about your symptoms and medical and family history. A physical exam will be done. The exam often reveals:

- Enlarged thyroid gland, also known as a goiter
- Rapid pulse rate
- Warm, moist skin
- Enlarged red prominent eyes (opthalmopathy)
- Prominent reflexes
- Muscle weakness (arms and legs)
- Rash on front of shins

Your doctor may order the following tests:

- **Blood tests**
  - Thyroid stimulating hormone (TSH), currently the best screening test
  - Free T4 and free T3—a pattern of a low TSH with high T3 and T4 levels confirms the diagnosis
Thyroid autoantibodies (TSH receptor antibody)
Thyroid scan—may be needed to differentiate between Graves' disease and other causes
Radioactive iodine uptake test—measures how active thyroid is in taking up the iodine

Treatment

Treatment will depend on:

- Cause of hyperthyroidism
- Pregnancy status

Treatment options include:

Antithyroid Drugs

Antithyroid drugs work best for Graves' disease. Examples include:

- Carbimazole—Smoking can interfere with how your body uses this medication. If you smoke, talk to your doctor about how to quit. (not commercially available in the United States)
- Methimazole—one daily
- Propylthiouracil—three times daily (Note: There is a small risk of serious liver damage with this medication.)

All these medications can cause a rash, fever and painful joints. Serious adverse reactions include lack of infection fighting cells and PTU specifically has been associated with liver failure.

If the disease goes into remission, you may no longer need medication.

Beta-Blockers

You may need to take beta-blockers. These drugs relieve rapid heart rate and jitters. Examples include:

- Propranolol
- Atenolol
- Metoprolol

Radioactive Iodine

Radioactive iodine is taken orally. It is then absorbed by the thyroid gland. Once there, it damages most of the thyroid cells. These cells can no longer produce thyroid hormones. Within days, the excess iodine passes out of the body in the urine or changes into a nonradioactive state. You may need to take a daily thyroid hormone replacement supplement.

Surgery

Surgery is rare for the treatment of hyperthyroidism. It may be an option when medical therapy fails.

After surgery, you will need to take a daily thyroid supplement.

Eye Protection

If there are eye symptoms like dry red eyes or double vision, your doctor may prescribe:

- Eye protection before sleep
- Artificial tears
If you are diagnosed with hyperthyroidism, follow your doctor's instructions. You may be referred to an eye specialist.

**Prevention**

There are no specific preventative steps. Get regular screening if you have a family history of hyperthyroidism.

**RESOURCES:**

The American Thyroid Association
http://www.thyroid.org/

National Graves' Disease Foundation
http://www.ngdf.org/

**CANADIAN RESOURCES:**

Health Canada
http://www.hc-sc.gc.ca/index_e.html/

Thyroid Foundation of Canada
http://www.thyroid.ca/

**REFERENCES:**


Last reviewed December 2011 by Lawrence Frisch, MD, MPH
Last Updated: 12/30/2011