



## GRAVES' DISEASE & THYROID FOUNDATION

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## Beta Blockers in Graves' Disease

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Inderal® (propranolol), a beta ( $\beta$ )-adrenergic blocking agent, is often used in patients with Graves' disease. Such therapy is thought to result in more rapid relief of some of the signs and symptoms, but it has no effect on the fundamental disease. Presented below is an overview of  $\beta$ -adrenergic blocking agents, more commonly called  $\beta$ -blockers, in relation to the patient with Graves' disease.

### Mechanism

These medicines belong to a class of drugs called " $\beta$ -blockers" because they block specific components of tissues called  $\beta$ -receptors and prevent adrenaline and other similar compounds from having an effect on different parts of the body. Graves' disease patients have increased sensitivity to adrenaline, and along with increased thyroid hormone in their blood, this results in rapid heart beat, sweating,

shakiness, anxiety, increased appetite, loss of weight, and intolerance to heat.  $\beta$ -blockers help to alleviate these symptoms when given along with antithyroid drugs or radioactive iodine in an effort to make the patient more comfortable while awaiting return to normal thyroid function. It should be pointed out that propranolol and other  $\beta$ -blockers do not have important antithyroid effects. However, they can cause a slight decrease in the conversion of the major thyroid hormone, thyroxine (T4) to its biologically active form triiodothyronine (T3).

### Use or Indication

1. Thyroid storm.
2. Additive to treatment with radioactive iodine;  $\beta$ -blockers can be used to control symptoms for the 4-8 weeks between the administration of radioactive iodine and its subsequent effects.
3. Preparation of patients for surgical removal of the thyroid gland when

antithyroid drugs cannot be used (allergies to the antithyroid drugs).

4. To slow rapid heartbeat.

### Contraindications

Propranolol and other  $\beta$ -blockers should be used with great caution in patients with the following conditions:

1. Lung diseases such as emphysema and asthma, because these agents cause bronchioconstriction (narrowing of air passages in the lung).
2. Heart failure, unless secondary to hyperthyroidism.

### Side Effects

Most people experience few or no side effects from this class of medications. However, any drug can sometimes cause unwanted effects. It is important to call your doctor if you develop a skin rash, shortness of breath, fever, wheezing, unusual bleeding or bruising, swelling of legs or ankles, sudden weight gain,

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impotence or decreased sexual ability, changes in vision, cold hands or feet, and numbness or tingling of the fingers or toes. Also, call your doctor if you develop nightmares, symptoms of depression, insomnia, unusual tiredness, headaches, or if you become confused.

### **Interactions**

Patients with Graves' disease are usually taking a variety of medications along with a  $\beta$ -blocker. Many of these medications can interact with each other producing unwanted side effects. It is very important in the course of developing a patient's therapeutic drug regimen, that all additional drugs be thoroughly discussed with their doctor or pharmacist to provide the best treatment results. Outlined below is a short list of drugs which may interact adversely with  $\beta$ -blockers (this is not inclusive of all interactions that exist with  $\beta$ -blockers): oral anti-diabetics (e.g. Glucotrol® or Diabeta®) and insulin,  $\beta$ -agonists (e.g. Ventolin®), all narcotics, non-steroidal antiinflammatory drugs (e.g. Motrin®), anti-convulsants (e.g. Dilantin®), theophylline, antiarrhythmic agents such as quinidine (e.g. Quinora® or Quinaglute®), and antihypertensive agents.

**Dosage Regimen** An oral dose of 40-160 mg as a single or divided dose of propranolol (Inderal®) given daily for a period of several weeks to months helps to achieve symptomatic relief in most patients. Newer and longer acting  $\beta$ -blockers are equally effective in equivalent doses including atenolol (Tenormin®), nadolol (Corgard®), or metoprolol (Lopressor®).

**Summary** As the activity of the thyroid declines from specific thyroid drug therapy, the dose of the  $\beta$ -blocker may be reduced and finally stopped. It is important to note that  $\beta$ -blockers do not alter all the effects of excess thyroid activity, and in some patients may have no beneficial effects when given simultaneously with antithyroid drugs. Also,  $\beta$ -blockers can have some adverse effects, particularly in hyperthyroid patients with cardiac disease. Therefore,  $\beta$ -blockers are valuable in patients with Graves' disease, but their main role is to enhance or support ongoing drug therapy of the disease.

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