

Growth Hormone Deficiency in Adults

A PATIENT'S GUIDE

Growth hormone deficiency (GHD) occurs when the pituitary gland does not make enough growth hormone. This important hormone is responsible for the body's growth and development. In children, GHD slows the growth rate and can result in short height. In adults, GHD can affect the way they look, feel, and function.

Most often, doctors diagnose this problem during childhood and can treat it with success. After growth hormone treatment in childhood, some people still have GHD as adults. GHD can also start in adulthood.

Not all adults with GHD need treatment. Therefore, experts in adult GHD have advised when treatment is best. This guide for adult patients is based on The Endocrine Society's practice guidelines for physicians about testing for and treating GHD in adults.

The guidelines do not apply to people who want to take growth hormone to slow aging or to improve their strength or athletic performance. Claims about using growth hormone to slow the aging process or build muscle in athletes have not been proven, and such use may cause harm. Do *not* take growth hormone unless you have a diagnosis of GHD and your doctor recommends it.

What are the causes of adult GHD?

Adults with GHD fall into two categories:

- 1) Childhood onset: GHD began during childhood and has continued.
- 2) Adult onset: GHD developed after reaching adulthood.

The causes of GHD include problems that are present at birth (congenital). The pituitary gland may be abnormal or there may be a genetic syndrome, such as defects in the gene in charge of making growth hormone.

Causes of GHD that can take place at any age, even in adults, involve damage to the pituitary gland or the part of the brain that controls the pituitary, called the hypothalamus. This damage may be caused by a tumor, surgery, radiation treatment, or a head injury. Rarely, the cause of GHD is *idiopathic*, meaning it is not known.

When should adults be tested for GHD?

Most adults whose GHD started in childhood should be retested for GHD after they have reached their final height to see if they still have the condition. Childhood GHD does not always continue into adult years. If you had a tumor or surgery in the pituitary region, have several other pituitary hormone deficiencies, or if you have proven genetic causes of GHD, you may need only to have a simple blood test to confirm that you are still affected by GHD. This test is done after you have stopped GH treatment for at least a month. If the results are unclear, you will need another blood test called a stimulation test.



Adults who did not have childhood GHD should have a stimulation test for GHD if they have any of these:

- a disease of the pituitary or the hypothalamus
- surgery or radiation treatment to the pituitary or brain
- a lack of other pituitary hormones
- a head injury

Adults who do not have any of these conditions in their history, or another known cause of GH deficiency, should have two tests for GHD. The less certain it is that someone has GHD based on pre-existing conditions, the more tests they need to confirm a diagnosis

Stimulation tests that help detect GHD are performed after fasting overnight. These tests involve giving patients a substance that typically stimulates the pituitary to release GH, and checking the response several times over a few hours. People with GHD do not release as much growth hormone, or have no rise at all, in response to these stimulators.

Two of the most accurate tests in adults are the *insulin tolerance test* and the *growth hormone-releasing hormone (GHRH) plus-arginine test*. Insulin lowers blood

sugar, which in turn stimulates the release of growth hormone. The insulin tolerance test causes side effects and may not be safe in some patients. GHRH directly stimulates the pituitary to release GH, and is safe, but is not available in all countries. In such cases, your doctor may suggest you have a test with another growth hormone stimulant, such as *glucagon*. Your doctor will work with you to pick the right test for you.

What are GHD symptoms in adults?

In adults, even though they are not growing taller, GHD affects health in many ways. Symptoms of GHD in adults include:

- Increased fat, especially around the waist
- Lower muscle mass and strength
- Mild bone loss
- Thinning skin
- Sleep problems
- Decreased exercise performance
- Decreased energy
- Decreased well-being, mild depression, or moodiness

What are the benefits of growth hormone therapy?

Growth hormone treatment involves injections (shots) of growth hormone made in a laboratory. The goal is to replace the natural growth hormone you are lacking and to reverse the symptoms of GHD.

Treatment may have these benefits:

- **Build muscle and decrease fat in your body**
- **Increase exercise capacity**
- **Build stronger bones:** Growth hormone spurs bone formation and bone resorption (the breakdown of old bone, essential to bone health). Patients should have a DXA bone scan to measure bone density before treatment with growth hormone. If it is abnormal, a DXA should be done about every two years after starting treatment. Because young adults in their 20s are often still growing bone mass, those with persistent childhood-onset GHD should not stop growth hormone treatment so they can reach their full bone mass potential.
- **Improve heart function:** Replacing growth hormone sometimes helps to improve heart function and reduce the markers of inflammation that show increased risk of heart and blood vessel damage.
- **Increase energy:** Energy and quality of life improve in some people who get growth hormone treatment.

Not everyone will see all these improvements with treatment.

EDITORS

George R. Merriam, MD, University of Washington Department of Medicine • Mark E. Molitch, MD, Northwestern University Feinberg School of Medicine

Note to health care professionals: This patient guide is based on, and is intended to be used in conjunction with, the Endocrine Society's clinical practice guidelines (available at www.endocrine.org/guidelines/index.cfm).

How will your doctor help you reach your treatment goals?

Your endocrinologist, a specialist in growth hormone treatment, will carefully evaluate you and decide if you need growth hormone. You should not receive growth hormone if you have cancer. If you have diabetes mellitus, your diabetes medications may need adjustment because growth hormone can raise blood sugar.

For growth hormone treatment, your doctor will decide the dose based on your sex and age and on other medicines you might be taking. Doctors most often start by giving a low dose of growth hormone. The dose may change over time. Doctors adjust the growth hormone dose based on how you respond to treatment, blood tests, and on any side effects you may have.

Most doctors who provide growth hormone treatment want to see their patient every one to two months at first to check for progress and any side effects. Once the right dose is found and tests show that the growth hormone is helping you as much as possible, you may need to visit your doctor only twice a year.

Your doctor will also make sure that all of your medications work together as well as possible. Tell your endocrinologist and primary care doctor about all of the medications you take. After you start a drug, call your doctor if you feel different or worse. Your new symptoms may be a side effect of the drug or an interaction from taking more than one drug. Your doctor can best explain all the risks and benefits of growth hormone replacement and other treatments you may need.

What can you do to help your treatment process?

Treatment for GHD often must continue for many years and possibly for life. One of the most important things you can do as a patient is to keep taking your prescribed dose of growth hormone and any other medicines you take. Another is to report any side effects you may have to your doctor.

In the United States, health insurance policies differ widely on covering growth hormone for adult patients. Be sure to check with your insurer about any special information they may require, and notify your doctor if your insurance coverage changes.

You and your doctor should be partners in your care. Keep appointments with your endocrinologist, ask questions, and take part in your care to ensure the success of your treatment.