

Hormone Disorders

Growth Hormone Deficiency

Patient's Guide



Average readability

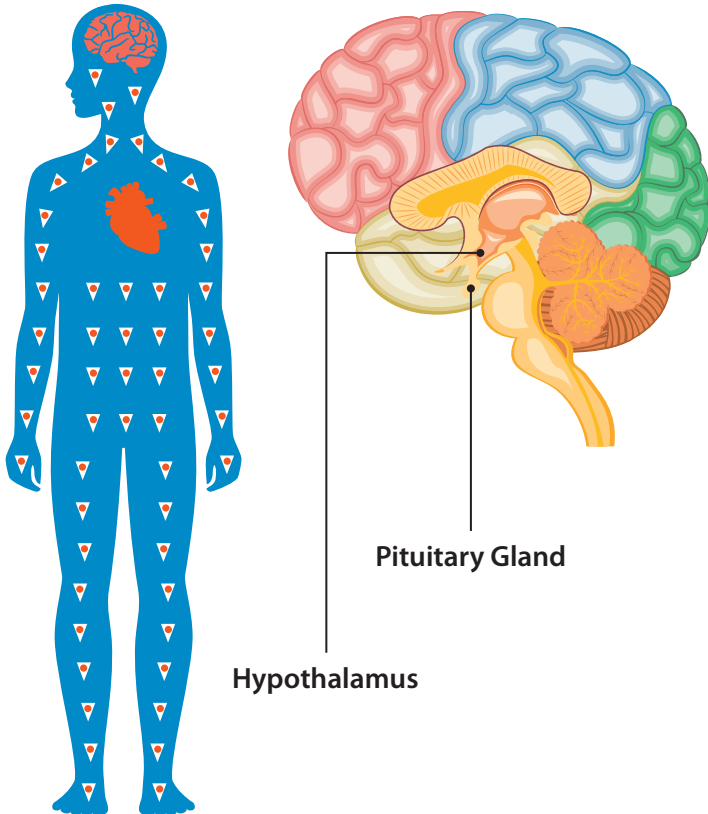
Introduction

This leaflet is intended to provide a better understanding of some aspects associated with Growth Hormone Deficiency. It has been written in general terms and not all of the information provided will apply to you. Hopefully, this leaflet will help you to understand this condition and give you a basis for discussions with your GP and specialist team.



What is Growth Hormone Deficiency (GHD)?

Hormones are messengers used around the body to produce an effect. The role of growth hormone is to control the growth of bones, muscles and organs. This hormone is produced in the brain and released in the blood.



Growth hormone deficiency (GHD) occurs when the brain fails to produce adequate levels of growth hormone. This is usually due to problems in either the **hypothalamus** or the **pituitary gland**, which are parts of the brain responsible for hormone production.

When a child's growth hormone level is very low or not present, the child is said to be **Growth Hormone Deficient**. When the level of growth hormone production is inadequate, the child is said to be **Growth Hormone Insufficient**.

Treatment for children whose growth hormone levels are deficient or insufficient is widely available.

What are the causes of GHD?

There are many causes of GHD but most remain unknown. There are many causes of GHD but most remain unknown. Commonly, GHD arises from damage to the pituitary gland at birth. This damage could also result from severe head injury. GHD may be hereditary in some cases.

How is GHD diagnosed?

Normal levels of growth hormone fluctuate from hour to hour in the blood. As a result, measuring these levels is a difficult task. Growth hormone is released in a series of 'spurts' throughout the day and night especially during sleep. To measure this hormone, blood must be taken when a surge of growth hormone has been provoked, or blood must be frequently taken at various times. Two main tests are used:

- **Provocation tests:** Growth hormone is stimulated and then measured in the blood.
- **IGF-1 test:** Blood is taken to measure the hormone IGF-1. This is a marker of how much growth hormone the body makes.

These tests give an idea of hormone concentration, which is compared against normal ranges. Normal hormone levels can vary from test to test. Further examination using other tests such as brain scans are often required.



What is the treatment for GHD?

The primary treatment for GHD is hormone replacement with a synthetic form of growth hormone. This synthetic form is similar to the natural human growth hormone.

What is the dosage, frequency and timing of GH?

The dosage of growth hormone varies according to the weight/size of your child. This means that the dose given to your child will increase, as he/she gets older and larger.

Growth hormone is usually prescribed to be taken daily, by subcutaneous injection. It is recommended to be injected in the evening, just before bedtime.



What is the Injection dosage?

The amount of growth hormone you need each day will be calculated specifically for your child and as the injection devices vary in how they work, you will be shown how to give exactly the right amount.

It is important that your doctor has quoted the dosage in **terms you understand** in mg. If you are unclear about this, do ask your doctor.

How is growth hormone stored?

Growth hormone should be kept cool, usually in a refrigerator (but not too near the freezer compartment). The drug is more affected by heat after having been mixed with the diluent. This information varies from product to product as some injection pens can be kept at room temperature when they are in use. Read the advice given in the leaflet that comes with your growth hormone.



What are the different forms of growth hormone injection?

The following devices are used to deliver growth hormone injections:

- **Pen Injector Systems:** Their appearance resembles a large writing pen which contains a cartridge of growth hormone. They offer the convenience of pre-measured doses.
- **Auto-injection devices:** Auto-injection devices completely enclose the needle and syringe so they cannot be seen. At the touch of a button the needle is inserted through the skin and the growth hormone is automatically injected.
- **Needle free injector:** In this device, the growth hormone is squirted through the skin using a high-pressure air injector. No needle is used. Some children may find this a little uncomfortable especially if they are very slim, but some children and families prefer it as the injection takes less time than with a device that has a needle.

What about injections during illness? (and missed injections)

Growth hormone should be continued during illness. However, if your child is too ill to inject without considerable upset, check with your doctor or nurse. Only consistent missed injections will effect growth. It is extremely important that no injections are missed if your child has low blood sugar associated with GHD.

If your child has **multiple pituitary hormone deficiencies (MPHD)**, treatment during illness is more complex. Nevertheless, continuation of some growth hormone treatment will be helpful.

What about treatment in puberty and adulthood?

Children who have growth hormone deficiency can also have other hormone deficiencies affecting sexual development. This will require additional treatment to initiate puberty.

In adulthood, growth hormone treatment may still be given. This is because growth hormone may help to prevent osteoporosis (brittle bones) and boost general well being.





What are the side effects of growth hormone therapy?

A few patients report a localised skin reaction or lumpiness at the site of injection. This can usually be treated by varying the injection site.

Occasionally headaches can happen when treatment starts, and you should inform your doctor if the headaches are persistent. Stopping for a bit and restarting more gradually usually helps this. A very rare but serious side effect is a slipped growth plate of the hip. When limping occurs, you should inform your doctor.

What are other sources of useful information?

The goal of this leaflet is to provide a basic overview of GHD.

Educational material can also be found by contacting the following organisations:

- **European Society for Paediatric Endocrinology**
Starling House
1600 Bristol Parkway North
Bristol
BS34 8YU
espe@eurospe.org
Telephone +44 (0) 1454 642246
www.eurospe.org
- **British Society of Paediatric Endocrinology and Diabetes**
bsped@endocrinology.org
<https://www.bsped.org.uk/>
- **Child Growth Foundation**
info@childgrowthfoundation.org
Telephone +44 (0) 208 995 0257
www.childgrowthfoundation.org
- **The Endocrine Society**
www.endo-society.org

You can also consult your specialist team for additional information in your local area.



Growth Hormone Deficiency

(Revised November 2019)

This leaflet is part of the **Hormone Disorders Series**

The following are also available:

Puberty and the Growth Hormone Deficient Child
Precocious Puberty

Emergency Information for Children with Cortisol and
GH Deficiencies and those Experiencing Recurrent
Hypoglycaemia

Congenital Adrenal Hyperplasia

Growth Hormone Deficiency in Young Adults

Constitutional Delay of Growth and Puberty

Multiple Pituitary Hormone Deficiency

Diabetes Insipidus

Craniopharyngioma

Intrauterine Growth Retardation or Small for Gestational Age

Hyperthyroidism

Hypothyroidism

Type 2 Diabetes and Obesity

The development of these leaflets was funded (as a service to medicine) by Merck. They are based on the original booklets series devised by the UK Child Growth Foundation and the BSPED, and the previous adaptations for easy and average readability levels by ESPE.



MERCK