

**Hormone Replacement Therapy in Adolescent Girls**

**Hormone Replacement Therapy** is often needed to treat hypogonadism in girls.

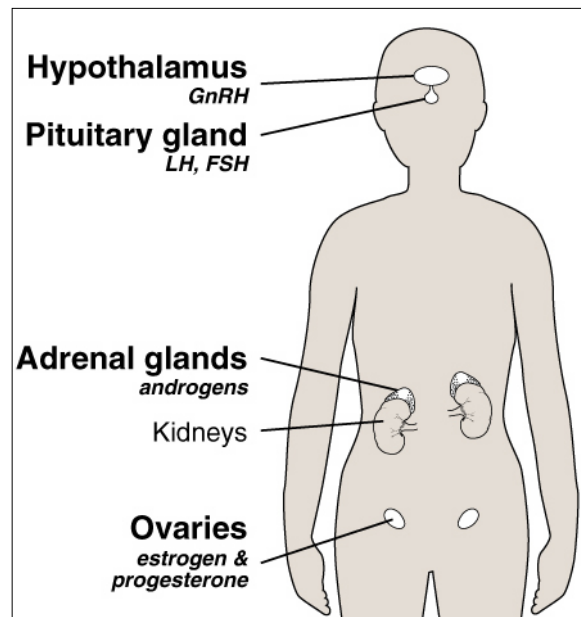
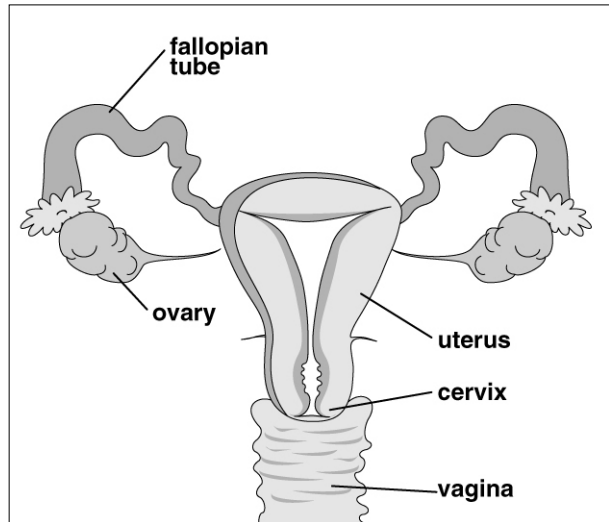
**Hypogonadism** happens when your body is not making enough sex hormones. This can happen if the pituitary gland, hypothalamus, or ovary doesn't work, or is missing.

**What organs in my body are involved in puberty?**

The **ovaries** are organs that make eggs and the sex hormones estrogen and progesterone. Estrogen helps breasts develop. Along with progesterone, it also helps to start and maintain monthly periods. It also helps girls to grow.

The **hypothalamus** and **pituitary gland** are parts of your brain. The hypothalamus releases gonadotropin releasing hormone GnRH, which tells the pituitary gland to send luteinizing hormone LH and follicle stimulating hormone FSH to the ovaries. The ovaries then make estrogen and progesterone.

The **adrenal glands** release androgens, which are hormones needed for pubic and armpit hair growth and body odor. If your adrenal glands are working you may have hair growth and body odor even if you have hypogonadism.



## What are the causes of hypogonadism?

- **Primary Hypogonadism:** Doctors use these words when the ovaries are not working. This happens with conditions like **Turner Syndrome, gonadal dysgenesis, and galactosemia.** This can also happen if the ovaries are damaged by treatments for cancers like radiation treatment, or if the immune system isn't working as it should.
- **Secondary Hypogonadism:** Doctors use these words when there is a problem with the hypothalamus or pituitary gland. This can happen if these parts of the brain did not form as they should have before you were born, or formed, but do not work as they should. This can also happen if the brain is damaged by treatment for cancers like removal of a tumor or radiation treatment.

## How will your doctor know if you are in puberty?

Doctors look for the normal signs of puberty to decide if your ovaries are working as they should. Puberty is the process that changes a girl into a woman. The normal age for the start of puberty in girls is between 8 and 14 years old. The signs caused by estrogen include:

- Breast changes
- Increase in growth rate
- Advances in bone age

If these signs do not happen as expected, your doctor may then wonder if you have hypogonadism.

## Bone Age

We can tell your bone age through a simple X-ray of your hand and wrist. By looking at this X-ray, your doctor can tell how mature your bones are and your potential growth. If your bone age is significantly delayed (less

than your age) and you have not started puberty, your doctor may begin to think about hypogonadism.

## Blood Tests

Your doctor will use blood tests to see how your ovaries, hypothalamus and pituitary gland are working. The main things your doctor checks are:

1. Estrogen
2. FSH
3. LH

Often the first test your doctor does is a single blood test to check the levels of these hormones in your blood. If the levels of FSH and LH are very high while the estrogen level is low, this tells your doctor that your ovaries are not making estrogen as well as they should. If the LH, FSH, and estradiol levels are low, then your doctor may want to do a second longer test. For the longer test, you will first get a small injection of luteinizing hormone releasing hormone (LHRH) followed by blood tests after that and maybe even the next day. A small needle or catheter may be left in the vein to collect the blood. If in that time you don't start making FSH and LH, this tells your doctor that your pituitary gland or hypothalamus is not working.

Sometimes, the cause of hypogonadism is genetic. Your doctor may look for genetic causes by doing a blood test to look at the chromosomes. Your chromosomes have all the important messages to tell the cells in your body how to develop. Chromosomes have messages that make your eyes a certain color, make all the organs including the ovaries develop, and control many other things about how you developed before you were born.

## **Other Tests**

If problems are found in your hypothalamus or pituitary gland, the doctor may ask you to have an MRI or a CT scan done. Both of these tests take a picture of your brain to better look at the pituitary gland where LH and FSH are made.

## **Why does hypogonadism need to be treated?**

The purpose of treatment is to replace the hormones that your body is not making enough of. This helps your body to:

- Start and maintain puberty
- Finish growing
- Have strong bones and prevent osteoporosis
- Prevent uterine cancer and heart disease
- Have sexual function such as sexual thoughts, feelings, and responses

## **How is hypogonadism treated?**

This is treated by taking hormones to try to copy what happens in normal puberty. As you get older, you take hormones to copy the way adult ovaries work.

You will probably start treatment when your bone age is 10 to 12 years old, but you may be older. Once you and your doctor decide that you should begin treatment, you will receive a very small amount of estrogen daily either by a pill or a patch on your skin. You may stay on this dose for the first 6-12 months. This dose is so low that often little or no signs of puberty are seen.

Your doctor will watch for signs of changes in your body and your bone age to decide when to increase your dose. You may see changes in your breasts and an increase in the rate of your growth. Some girls may also see pubic hair, armpit hair, and acne. It

may be different for each person. Ask your doctor if you have any concerns.

After about 1-2 years of estrogen treatment, progesterone is added. This helps to start monthly periods and keep them cycling.

There are two ways to take these hormones. The first is by daily pills. These are made as two separate pills, or as a combined pill. It is the same type of pill called a “birth control pill”.

The second way is a patch which is worn on your hip or buttock, and releases estrogen and sometimes progesterone through your skin. Skin patches are a good option for girls with galactosemia because the patches do not contain lactose.

**It is important to take your medicine as prescribed.** To help you remember, you may want to use a calendar or a day of the week pillbox. If you are having trouble, ask your nurse or doctor for help.

## **How long will I need treatment?**

Even after you complete puberty, you need to take hormones to maintain strong bones, prevent uterine cancer, and reduce the risk of heart disease. Treatment tries to copy the hormone patterns of the normal menstrual cycle.

## **Are there any side effects?**

As with any drugs, there are side effects to taking hormones. Some nausea, breast soreness, and unexpected bleeding can occur. For girls with Turner Syndrome, the hands and feet may be more swollen.

Hormone replacement in girls with hypogonadism is not the same as that in postmenopausal women. The treatment for hypogonadism provides hormones at a time when they should be present in the body. As a result, there are fewer and less serious side effects.

However, you should stop taking your hormones and call your doctor if you have problems breathing or severe pain in one leg.

### **Are there other concerns I should know about?**

#### **Height**

Estrogen does two things in with growth. First, it gives a boost to your growth rate, making you grow faster. It also helps to eventually close the growth plates in your bones, and shortens the time you have to grow. Higher dose estrogen treatment may be delayed to give you more time to grow before your growth plates close. Talk with your doctor or nurse about the best time to start treatment. Your feelings are important in this decision.

#### **Fertility**

There are many causes of hypogonadism. Each cause has different effects on fertility. You may need to talk with your doctors as you get older. They can talk with you about your options, as they are different for each person.

#### **Sexual Function**

With treatment, you should be able to have normal sexual function. If you decide to become sexually active, be sure to talk about the use of condoms with your doctor or nurse to protect yourself against pregnancy and sexually transmitted diseases.

#### **Breast Growth**

The breast size you develop depends much more on your genetics than on the dose of estrogen you take. Your doctor will decide on the dose of estrogen that is best for you. Changing this dose will not change the amount of final breast growth you get.

#### **Final thoughts**

While there is no cure for hypogonadism, taking hormones can help you to grow and develop. Be sure to ask your doctors or nurses about the best treatment options for you.

#### References

Guidelines for Girls and Women with Turner Syndrome, 2007. Journal of Clinical Endocrinology and Metabolism.

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 1/2018 University of Wisconsin Hospitals and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#5686