RANDALL CHILDREN'S HOSPITAL
LEGACY EMANUEL

Gender Care Center
Suppression of Puberty

Puberty Overview

Let's start by describing what happens during puberty.

When the brain determines that it is time to start puberty (usually around age 11 in assigned males at birth and 10 in assigned females at birth) the pituitary gland releases 2 hormones called LH (luteinizing hormone) and FSH (follicle stimulating hormone). As these two hormones rise, they both effect the sex gland (either the testes or ovary) by stimulating production of sex hormones: testes produce testosterone, and ovaries produce estrogen. It is these hormones that cause the changes we see with puberty:

In assigned males at birth: First, the LH and FSH cause increase in testicular size, which then results in an increase in testosterone production. Testosterone causes increase in pubic hair and phallic size, acne, underarm hair and facial hair. Eventually a growth spurt occurs, and voice deepens. At around 17-18 years of age, puberty is complete, and adult height is reached.

In assigned females at birth: estrogen causes chest development first. This progresses, and fat deposits occur resulting in a curvy body type. About 2 years after the start of breast development, menstrual cycles typically start. A person assigned female at birth does get pubic hair, underarm hair and acne, but not from estrogen. These changes come from hormones that are produced from the adrenal glands, and happen independently of LH, FSH and estrogen.

What are puberty suppressors and how do they work?

Puberty suppressors are medications that suppress the release of LH and FSH from the pituitary gland. This then stops testosterone from being released from the testes, and estrogen from being released from the ovaries making them SUPPRESS PUBERTY. Without exposure to testosterone or estrogen, the body does not undergo the changes associated with puberty. Puberty suppression is reversible meaning, once the medication is stopped, the person will continue the puberty of assigned sex at birth after a period of time (approximately 6 months).

<u>These medications come in different forms:</u>

- Leuprolide or Depot Lupron; Fensolvi; Eligard: These forms of the medicine are an injection that is given every 3-6 months and is injected subcutaneously or into the muscle. Patients come to a medical office to receive this medication.

- Supprelin or Histrelin: This form is an implant, which is a very small device that goes under the skin of one's upper arm, and it slowly releases the medicine over a period of one to two years. It must be replaced every other two years by a surgeon either with sedation or general anesthesia.

Why are they used and when are they prescribed?

Pubertal suppression is used for a variety of reasons. In children, they are used to treat precocious puberty, when puberty happens too early. They are given to a child until the child is old and mature enough to enter puberty, and once this medicine is stopped, the child will go through puberty on their own.

In adults, these medicines are used for treatment of certain cancers, like prostate cancer, to prevent the patient from being exposed to hormones that can increase cancer growth.

In transgender youth, puberty suppression is used to suppress the pubertal changes of their assigned sex at birth. For many patients, gender affirming hormone treatment can be used during puberty suppression as part of someone's gender transition.

What about the safety of puberty suppression?

We can safely and legally recommend puberty suppressors based on our medical expertise and judgement. Furthermore, The Endocrine Society and World Professional Association for Transgender Health (WPATH) support the use of these medications. The Food and Drug Administration (FDA) approves puberty suppressors for children who start puberty at a very early age, however the FDA has not approved puberty suppressors for use in transgender children yet as this is a new indication for the use of these medications.

What do they cost and are they covered by insurance?

These agents are expensive. The injection can be anything from $6,000-$22,000. Typically, depot-Lupron costs approximately $10,000 dollars for the 12 week preparation. The Fensolvi injection is $22,000 and Eligard, it's generic form is around $7,000 per 6 month dosing The Histrelin implant is approximately $45,000 for the device, plus the cost of implanting it.

Labs need to be monitored while on this medication, meaning we do bloodwork 2-3 times a year. A pre-treatment LH, FSH and Testosterone or Estradiol level is checked, as well as a post treatment level to assess level of suppression.

As of January 2015, Oregon Health Plan covers puberty suppression, and now most major health care plans do as well. If insurance initially denies treatment, we will appeal.

Some insurances cover one form of puberty suppression and not another. For example, some may cover the injections but not the implant. We will inform you of your insurance benefits in order to help you make the best decision for you and your family. The final cost to the patient will be determined by their individual coverage.

What if the child has already begun puberty?

A young person must start puberty to demonstrate that there is puberty to suppress. LH and FSH need to be elevated to prescribe this medicine. The LH and FSH levels are checked again after treatment to make sure they have decreased.

Being on this medication will cause some breast reduction in those assigned female at birth. In those assigned male at birth, testicular size will decrease and phallic growth will stop, but not regress. The frequency of spontaneous erections and wet dreams decreases. Pubertal suppression will not reduce or stop the growth of pubic hair, axillary hair or acne in anyone.

In adolescents further along in puberty, the decision to start pubertal suppression is individual. People with ovaries who menstruate may experience menopausal symptoms with an abrupt decrease in estrogen levels. Breast development, if advanced, will not regress. In people with testes, the size of the testicle does not decrease if it is further along in puberty. However, if there is not a lot of other effects of testosterone such as facial hair or voice change, it may be beneficial for that person not to be exposed to more testosterone. Our providers will discuss these aspects and how they pertain to all patients and families in order for us to make the best decisions with you.

How does the Provider know I am in Puberty?

First the medical provider will perform a physical exam looking for the first signs of puberty (testicular enlargement or breast development). If these signs are present, labs (blood draw) will be obtained for levels of LH, FSH, and Testosterone or Estrogen. We may obtain a bone age X Ray to determine how old the bones are to help guide the decision making. The labs can take up to 14 days to return as they are sent to an outside lab in California.

If the labs do not show puberty, but the provider thinks puberty has started after physical exam, we may elect to perform what is called a stimulation test. This procedure takes place in our day treatment unit where a nurse will place an IV. Baseline labs will be drawn and then a medication will be given. This medication will stimulate the pituitary to release LH and FSH, but only if a person is in puberty. Labs are then obtained at 1 hour and at 24 hours to look for pubertal rises in these hormones, as well as with testosterone or estrogen.

What are the Risks of Puberty Suppressors?

A. Short Term

- Pain at the injection or insertion site. We work to find ways to minimize the experience of pain at these sites. With injections, acetaminophen, ibuprofen, heat or ice, and most importantly, keeping the muscle that the injection went in moving can help with pain. If an implant is used, the surgeons use local anesthesia to numb the site, and may recommend acetaminophen or Ibuprofen for soreness after the procedure.
- Sterile abscesses rarely occur with Lupron injections. Occasionally we can see a painful abscess at the site of the injection that is not bacterial. This presents with intense pain, heat, and swelling up to two weeks after the shot is given. To evaluate, an ultrasound would be ordered, and the abscess may need to be drained by a

surgeon. If this happens, shots can not be continued, and an implant would be recommended.

B. Long Term

- Bone Health: Suppressing puberty can make bones weaker (lower bone density). This may get better when stopping the puberty blockers or start gender affirming hormone care. While on suppressors, we recommend taking Vitamin D and getting ample amounts of calcium as well as engaging in weight bearing exercise.
- Fertility: Infertility is a concern for people who stay on puberty suppressors and then go on gender affirming hormones as their reproductive organs do not mature. We recommend our patients talking about this with their provider to understand the potential impact on fertility before starting any medications. We can also arrange a consult with a fertility specialist.

Are Puberty Suppressors Right for Me?

We work hard to answer all questions about the benefits and risks of puberty suppressors. We want all our patients to have a good understanding of what to expect before starting. These medications can prevent some of the masculine or feminine specific changes that occur in puberty. In some, the use of these medications may decrease the need for future surgeries, such as gender affirming top surgery or hair removal.

How long before they start working?

It can take several months for puberty suppressors to start working. Everyone is different and people respond at different rates. Typically, by 3-6 months, all puberty hormones are suppressed. Some see an increase in the signs of puberty in the first month after starting and possibly a one-time menstrual bleed in those assigned female at birth and spontaneous erections in those assigned male at birth.

How long are people on Puberty Suppressors?

This is also an individualized plan. Typically, someone one can stay on puberty suppressors until they are on adult doses of gender affirming hormones. This means they can be on a suppressor as gender affirming hormones are started and increased incrementally over time. If someone has started suppressors before gender affirming hormones, the body needs exposure to a sex hormone (either estrogen or testosterone) by the age of 16 years at the latest. This is important for bone strength and building peak bone mass.