

Precocious Puberty

What is precocious puberty?

Precocious puberty refers to puberty that appears earlier than expected (in boys if it occurs before the age of 9 years, in girls before the age of 8 years).

How does puberty occur?

Normal puberty involves the release of **hormones** (chemical messengers) in the blood. These hormones work together to help your child's body to mature and develop. This process starts with the release of a hormone called **GnRH** (gonadotropin releasing hormone), from the **hypothalamus** in the brain. This hormone causes the release of other hormones, **LH** and **FSH** from the **pituitary gland** (located at the base of the brain). LH and FSH, in turn, cause the release of **male and female sex hormones** from the **testicles** or **ovaries**. In boys the testicles make testosterone, the main male sex hormone. Testosterone causes a boy's voice to deepen, the penis to enlarge, pubic hair to grow, and the muscles to develop. In girls, the ovaries make estrogen, the main female sex hormone. The ovaries also make progesterone and small amounts of male hormones. Progesterone and estrogen are involved on the regulation of the menstrual cycle.

What causes precocious puberty?

In the majority of cases the cause is unknown. The hypothalamus and the pituitary begin signaling the ovaries and testicles to make female or male hormones at an earlier than usual time. This is referred to as "**central**" **precocious puberty**, because the message originates in the brain. Central precocious puberty must be distinguished from abnormalities in the ovaries, testicles, or adrenal glands that can also cause certain signs of sexual maturation to appear sooner than expected. Undesired environmental exposure to Estrogen or Testosterone such as those in some personal care products, skin gels, or medicines (for example birth control pills, testosterone gel, lavender oil, or tea tree oil) can also cause signs of sexual maturation to appear.

How can precocious puberty be diagnosed?

Since there are many causes of precocious puberty, your doctor will ask many questions and perform a complete **physical examination**. **Blood tests** may be done to measure hormone levels that are increased in puberty. An **X-ray** of the left hand and wrist may also be taken to determine the **bone age** or the maturation of your child's bones. Often a **GnRH stimulation test** may need to be done to determine whether the cause is central (the brain is signaling to start puberty). The test is 3 hours long. A medication is given, and then blood is drawn at hourly intervals. In girls a **pelvic ultrasound** is sometimes needed to check the adrenal glands, ovaries and uterus for abnormalities that may be responsible for causing early puberty. A **MRI** (magnetic resonance imaging) scan of the brain and pituitary gland may be done to look for abnormalities.

What are the possible effects of precocious puberty?

Although children with this problem are usually tall, their bones may mature so rapidly that they will **stop growing** at an earlier age and may remain short after completion of puberty. The degree of short stature is variable, but generally the earlier the onset of puberty and the more rapid its progression, the shorter the final adult height.

Children who experience precocious puberty will start to grow and physically mature more rapidly than their peers. This may **psychologically** affect the child. It may be hard for him/her at this young age to accept the body changes associated with precocious puberty. These children often appear older than their **chronological** or "**birthday**" **age**; therefore, people may treat them as older and have expectations that exceed their age and level of maturity. When a child is unable to meet these expectations he/she may feel inadequate or that he/she is a failure. It is important to treat your child according to the "**birthday age**" rather than the "**height age**". Parents should remind teachers, relatives, and friends about treating the child according to his/her actual age. You should also encourage your child to discuss any worries that he/she may be having about his/her appearance or the way others are treating him/her.

All children want to look and act like their friends. It is helpful to emphasize to your child that all girls and boys normally experience puberty, but in his

or her case it has occurred sooner than usual. It is important to tell your child that the changes in her/his body are normal.

The hormones that allow puberty to begin can also cause emotional changes, including tantrums, moodiness or irritability. Parents should discuss these changes with their physician to determine the best approach for treatment.

What is the treatment for precocious puberty?

The treatment will vary depending on the cause. The need for treatment varies with the age and emotional development of the child, the stage of puberty, bone age, and whether the puberty is rapidly progressing. If your doctor feels treatment is necessary, your child may be given a medication to **temporarily stop puberty**. It is a **gonadotropin releasing hormone agonist**, known as **Lupron**. The goal of treatment with this drug is to decrease the rate of bone maturation. Rapid bone maturation will cause your child's adult height to be significantly shorter than his/her potential height. It may also be helpful to stop sexual maturation until your child is psychologically ready for the bodily changes that come with puberty.

The medication is administered as an intramuscular injection that needs to be given **every 28 days** at our office by the nurse.

In the first month of treatment, it is not unusual to see girls have a slight increase in breast size and rarely, a menstrual period or spotting. After the first couple of month of treatment, your child's growth should slow to a more normal rate for his/her age. The pubertal stage (breast size or testicular size) will remain the same or possibly regress. Acne, pubic hair, axillary hair, and body odor may persist or continue to progress. Treatment usually continues until the child reaches the appropriate age for puberty to occur.

When will my child need to be seen by the doctor?

It will be important for your child to be seen by the pediatric endocrinologist in our office every 3 months. This will allow the doctor to measure the height and determine the growth rate; a physical exam will be done to evaluate development, and lastly the dose of medication (if therapy was initiated) may need to be adjusted to ensure that your child is receiving the appropriate amount. If treatment with GnRH agonist is initiated, the GnRH stimulation test will need to be repeated on the day the second dose is due to ensure that puberty is adequately suppressed. It is important that

your child receives the shot every 28 days. A delay of more than 1-2 days may "restart" puberty.

Even though you will be seen in our office frequently, remember to follow up with your child's primary care physician for routine medical care.

Resources for children with precocious puberty and their families:

The Human Growth Foundation:

1-800-451-6434

www.hgfound.org

The Magic Foundation:

1-800-3MAGIC-3

www.magicfoundation.org