

## **WHAT IS PRECOCIOUS PUBERTY?**

Precocious Puberty refers to puberty that appears earlier than expected. Enlargement of the testicles in boys before the age of 9 years or breast enlargement in females before the age of 8 years is considered precocious, or early puberty.

## **HOW DOES PUBERTY OCCUR?**

Normal puberty involves the release of hormones (chemical messengers) in the bloodstream that carries information from one gland to another. These hormones work together to help your child's body mature and develop. This process starts with the release of the hormone, 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 brain). LH and FSH, in turn, cause the release of male and female sex hormones from the testicles or ovaries.

The testicles in boys make testosterone, the main, male sex hormone. Testosterone causes a boy's voice to deepen, the penis to enlarge, the muscles to develop, the body to grow pubic and axillary (under arm) hair, and increase the oiliness of the skin. Smaller amounts of androgens, including testosterone, are made in girls as they progress through puberty. These initial low levels of androgens are made in the adrenal glands. The adrenal glands sit in the back above the kidneys. The adrenal glands also make male hormones in boys, but the amount is usually so much less than that coming from the testis. Estrogen, the main female sex hormone, is made by the ovaries in girls but is also found in smaller amounts in boys. It causes breast development in girls and increases bone growth and maturation in boys and girls.

## **WHAT CAN CAUSE PRECOCIOUS PUBERTY?**

In most cases, the cause is unknown. Sometimes the pituitary begins signaling the ovaries and testicles to make sex hormones at an earlier age than would normally be expected. 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 cause certain signs of puberty to appear sooner than expected. Undesired environmental exposure to sex hormones such as those in some skin care creams or medicines, such as birth control pills, can also cause signs of puberty to appear.

## **HOW CAN THE CAUSE OF PRECOCIOUS PUBERTY BE DIAGNOSED?**

Since there are many cause of precocious puberty, your doctor will ask many questions and perform a complete physical examination to determine the possible causes of your child's early puberty. Blood test may be done in order to measure the hormones that increase during puberty. An X-ray of the left hand and wrist may also be taken to look at the aging of your child's bones. These tests are often called screening tests. These results will help your doctor determine the next step in the process. Often, a special test, called a GnRH stimulation test, may need to be done to determine whether the brain is sending signals to start puberty. The stimulation test is performed by first starting an IV, then giving a medication, and finally drawing hormone levels at specified times for 1-2 hours. In girls, a pelvis ultrasound is sometimes needed to check the adrenals, ovaries and uterus for abnormalities that may be

responsible for causing or be the result of the early puberty. A MRI (magnetic resonance imaging) or picture of the brain and pituitary gland may be done to look for abnormalities in these parts of the body.

### **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 early age and may remain short after the 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 the child is unable to meet these expectations they may feel inadequate of that they are a failure.

Unfortunately, their more mature physical appearance coupled with their age appropriate emotional development can increase the child’s risk of sexual abuse by older children or adults. It is important to treat your child according to the “birthday age” rather than the “height age”. It is also important to encourage your child to discuss any worries that he/she may be having about his/her physical appearance or the way others are treating him.

Your child may feel embarrassed by his/her changing physical appearance; therefore, it is important to reassure your child that they are normal and that all girls and boys go through these changes known as puberty. For them, however, puberty has begun earlier than usual. It may be helpful to buy clothing that is age appropriate and helps your child feel comfortable. For example, loose fitting clothing may minimize the visibility of breast development in a young girl experiencing precocious puberty. The hormones that allow puberty to begin can also cause emotion 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 your child’s test results. 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 progressive. If your doctor feels that treatment is necessary, your child may be given a medication to temporarily stop puberty. The medications (gonadotropin releasing hormone agonists) act by blocking the activation of the pituitary gland and therefore stop the release of the puberty hormones. During the first few weeks of treatment, it is not unusual to see girls have acne, a slight increase in breast size and, rarely, menses or spotting. Boys may have acne, as well as a slight increase in pubic hair and testicular development. Mood changes are often seen in both boys and girls during the early phase of treatment. After a few months of treatment, your child’s growth should slow to a more normal rate for his age. In boys, the testicular size should decrease, and there should be no progression of pubic hair or genital development. In girls, the breast tissue may regress and the pubic hair should not 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?**

Initially, visits to the pediatric endocrinologist will be frequent, to properly adjust the medication dosage. Once your physician determine that puberty has been stopped, visits can be spaced further apart. Even though you will be seeing the endocrinologist frequently, remember to follow up with your child’s primary care doctor for routine health care.