

Puberty

Puberty refers to the series of physical changes by which a child's body becomes an adult body capable of reproduction.

Puberty is started by hormone signals from the brain to the gonads (testes in men, ovaries in women). In response, the gonads produce a variety of hormones that stimulate the growth, function, or transformation of brain, bone, muscle, blood, skin, hair, breasts, and sex organs.

Before puberty, differences between boys and girls are almost entirely restricted to the genitalia. During puberty, major differences of size, shape, composition, and function develop in many body structures. The most obvious of these changes are called the **secondary sexual characteristics**.

Differences Between Male and Female Puberty

Two of the most important differences between puberty in girls and puberty in boys are the age at which it begins, and the major hormones involved.

Although there is a wide range of normal ages, girls typically begin puberty at age 10 or 11, while boys begin at age 12 or 13. Girls complete puberty by age 15-17, while boys usually complete puberty by age 16-18.

The major hormone responsible for puberty in boys is **testosterone**. The major hormone responsible for puberty in girls is **estrogen**.

Physical Changes in Boys

The male body undergoes a number of changes during puberty, including:

- testicular size increases throughout puberty, reaching "adult size" about 6 years after the start of puberty
- the testicles begin to produce sperm about 1 year after the start of puberty
 - on average, boys become "potentially" fertile at age 13
 - full fertility is reached at around 14-16 years of age
- the scrotum enlarges and begins to hang below the body (this is to lower the temperature of the testicles to encourage sperm production)
- pubic hair appears on the genitalia
- body hair begins to form in various areas: underarm, upper lip, sideburn, chest, beard
- the voice deepens (approximately one octave)
- muscle mass increases (nearly twice as much by the end of puberty)
- skeletal development leads to a characteristic male build: wide shoulders, narrowing to roughly equal hips and waist
- the chemical composition of sweat changes, resulting in a more "adult" body odor
- increased oil production from the skin often results in acne

Physical Changes in Girls

The female body undergoes a number of changes during puberty, including:

- breasts develop (this is usually the first physical sign of puberty in girls)
- pubic hair appears on the genitalia
- body hair begins to form, mostly in the underarms, but may also appear in other areas
- the uterus and ovaries increase in size
- menstruation begins at around 12 years old (average)
- skeletal development leads to a characteristic female build: wider at chest and hips, narrower at waist
- girls generally develop less lean muscle mass (about 33% less), and more body fat (about 50% more) than boys
- the chemical composition of sweat changes, resulting in a more “adult” body odor
- increased oil production from the skin often results in acne