

## Klinefelter Syndrome

### What is Klinefelter syndrome?

Klinefelter syndrome, also known as the XXY condition, is a term used to describe males who have an extra X chromosome in most of their cells. Instead of having the usual XY chromosome pattern that most males have, these men have an XXY pattern.

Klinefelter syndrome is named after Dr. Henry Klinefelter, who first described a group of symptoms found in some men with the extra X chromosome. Even though all men with Klinefelter syndrome have the extra X chromosome, not every XXY male has all of those symptoms.

Because not every male with an XXY pattern has all the symptoms of Klinefelter syndrome, it is common to use the term **XXY male** to describe these men, or **XXY condition** to describe the symptoms.

Scientists believe the XXY condition is one of the most common chromosome abnormalities in humans. About one of every 500 males has an extra X chromosome, but many don't have any symptoms.

### What are the treatments for the XXY condition?

The XXY chromosome pattern can not be changed. But, there are a variety of ways to treat the symptoms of the XXY condition.

*Educational treatments* – As children, many XXY males qualify for special services to help them in school. Teachers can also help by using certain methods in the classroom, such as breaking bigger tasks into small steps.

*Therapeutic options* – A variety of therapists, such as physical, speech, occupational, behavioral, mental health, and family therapists, can often help reduce or eliminate some of the symptoms of the XXY condition, such as poor muscle tone, speech or language problems, or low self-confidence.

*Medical treatments* – Testosterone replacement therapy (TRT) can greatly help XXY males get their testosterone levels into normal range. Having a more normal testosterone level can help develop bigger muscles, deepen the voice, and grow facial and body hair. TRT often starts when a boy reaches puberty. Some XXY males can also benefit from fertility treatment to help them father children.

One of the most important factors for all types of treatment is starting it as early in life as possible.

### What are the symptoms of the XXY condition?

Not all males with the condition have the same symptoms or to the same degree. Symptoms depend on how many XXY cells a man has, how much testosterone is in his body, and his age when the condition is diagnosed.

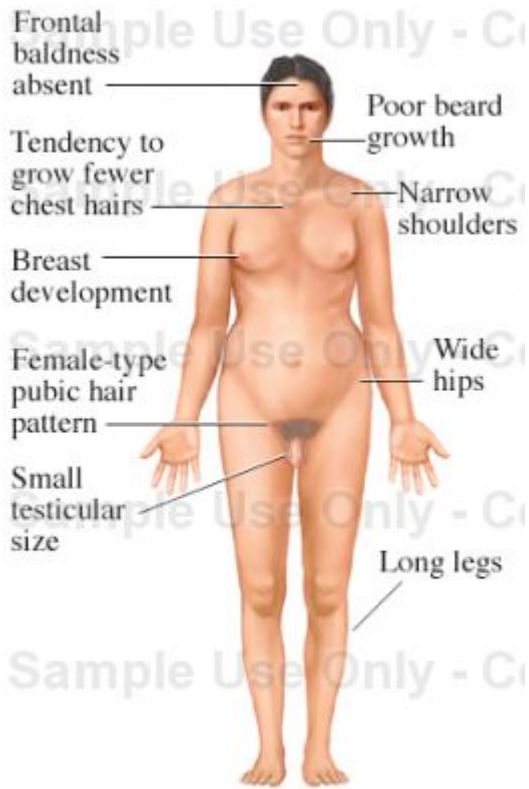
The XXY condition can affect three main areas of development:

**Physical development:** As babies, many XXY males have weak muscles and reduced strength. They may sit up, crawl, and walk later than other infants. After about age four, XXY males tend to be taller and may have less muscle control and coordination than other boys their age.

As XXY males enter puberty, they often don't make as much testosterone as other boys. This can lead to a taller, less muscular body, less facial and body hair, and broader hips than other boys. As teens, XXY males may have larger breasts, weaker bones, and a lower energy level than other boys.

### Klinefelter Syndrome continued

By adulthood, XXY males look similar to males without the condition, although they are often taller. They are also more likely than other men to have certain health problems, such as autoimmune disorders, breast cancer, vein diseases, osteoporosis, and tooth decay.



**Language development:** As boys, between 25 percent and 85 percent of XXY males have some kind of language problem, such as learning to talk late, trouble using language to express thoughts and needs, problems reading, and trouble processing what they hear.

As adults, XXY males may have a harder time doing work that involves reading and writing, but most hold jobs and have successful careers.

**Social development:** As babies, XXY males tend to be quiet and undemanding. As they get older, they are usually quieter, less self-confident, less active, and more helpful and obedient than other boys. As teens, XXY males tend to be quiet and shy. They may struggle in school and sports, meaning they may have more trouble “fitting in” with other kids. However, as adults, XXY males live lives similar to men without the condition; they have friends, families, and normal social relationships.