

What are puberty blockers, and how do they work?

10 December 2020, by Faisal Ahmed and Angela Lucas-Herald



The doctor will take a child off puberty blockers when they're around 11-12 years. Credit: [Dmitriy Utlanov/Shutterstock](#)

The use of puberty blocking drugs to treat adolescents with gender dysphoria or incongruence has recently come under scrutiny following a [decision by the UK High Court](#). Three judges ruled that children under 16 were unlikely to be able to give informed consent to undergo such treatment.

The case has raised questions about the effects so-called [puberty blockers](#) have on adolescents, whether the drugs are safe and whether their effects are reversible. The difficulty in answering these questions is that the evidence for the use of these drugs on adolescents with gender incongruence is limited, and more research is needed.

But while treating gender incongruence with puberty blockers is a relatively recent application, these drugs have been used on [children](#) since the 1980s for slowing down puberty if it happens too early or too quickly. Currently, there's sufficient evidence to show the drugs are safe and well-tolerated in children with [early puberty](#).

Puberty starts when the [body's glands](#) begin producing the hormones needed to reach sexual maturity. Normally, puberty rarely occurs before the age of eight in girls, and nine in boys. But if it happens very early or very fast, physicians may consider the use of drugs to slow down or stop puberty.

This is done so the child can reach the physical milestones associated with puberty at a steady rate, and which are appropriate for their age. For instance, it's possible that if puberty happens too early and too fast, there won't be enough time for the adolescent to grow properly.

The most common form of early puberty in children is premature activation of gonadotrophin releasing [hormone](#) (GnRH). This hormone is essential for development as it causes the pituitary gland to begin producing the hormones that subsequently trigger the testes and ovaries to start making the sex hormones testosterone and oestradiol (estrogen).

But because GnRH is naturally released in pulses, sustained exposure to the hormone (or an artificial version of it) will actually stop the GnRH receptors (located in the [pituitary gland](#)) from producing sex hormones, effectively pausing puberty. The receptors will begin working again and puberty will restart once exposure is stopped.

The most common puberty blockers are GnRH analogs, a synthetic form of the hormone. These are usually administered as injections either monthly, or at three or six month intervals. Generally, these puberty blockers are continued until the child is around 11 to 12. Once stopped, children begin puberty again as normal. In such cases, menstrual periods in girls start on average about 18 months after stopping puberty blockers.

In children, most evidence supporting the use of puberty blockers for stopping early puberty has

looked at GnRH analogs. Research shows these drugs are very effective at temporarily pausing puberty, and don't effect a child's [overall height](#) development once stopped.

As for side effects, some studies have reported weight gain with the use of puberty blockers—but this has not been a [consistent finding](#). Other studies have looked at the effect of puberty blockers on bone health in children with early puberty and not found any [long-term problems](#).

Researchers have also investigated whether puberty blockers may lead to the development of polycystic ovaries in women. This condition affects the ovaries, and may cause irregular periods and difficulty getting pregnant. Again there are no [consistent findings](#) here either. In studies that have shown a link between puberty blockers and [polycystic ovary syndrome](#), it's unclear whether this is because of the underlying condition which caused early puberty or the effect of the [drug](#) itself.

No studies to date have shown any adverse effect of GnRH therapy on neurocognitive development. These drugs are [generally safe and well-tolerated](#) in children with early puberty. Once stopped, the child begins puberty and develops as expected.

Other uses

GnRH analogs have also been used in fertility medicine, to treat hormone-sensitive prostate and breast cancers, and in other [gynecological conditions](#), such as endometriosis.

But more recently, these drugs have been used in [children and adolescents with gender incongruence](#). In such cases, blocking puberty gives the adolescent more time to explore their options and to live in their preferred gender, and avoid developing any secondary sexual characteristics such as the growth of breasts or facial hair.

If they and their doctors decide it is suitable, the young person can then start taking gender-affirming hormones—such as testosterone in trans boys and estrogen in trans girls—which can have irreversible effects. But the use of GnRH analogs in these circumstances is temporary until a firm decision has

been made about the child's gender.

However, there's still limited evidence on the effects of puberty blockers in these adolescents in whom puberty had started normally. During the time that puberty is blocked, it's possible that growth and bone health may be affected. But further research is required in this area. There's also limited information on the long-term effects of the use of puberty blockers in children and adolescents with gender incongruence.

In general, while the evidence is clear that the use of puberty blockers in children with early puberty can be considered safe and well tolerated, the extended use of puberty blockers for other uses needs further research.

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