CONDITION

Delayed puberty in girls

Delayed puberty in girls means expected breast development or periods have not begun by the usual age.

WHAT IT IS
Puberty starting later than the expected age

BODY SYSTEM
Hormones and reproductive development

MAIN SYMPTOMS
No breast development, no periods, delayed growth spurt

WHAT CAUSES IT
Family timing, low hormone signals, or ovarian problems

HOW IT IS DIAGNOSED
Growth assessment, hormone tests, and bone-age X-ray

MAIN TREATMENT
Monitoring, cause-specific care, and hormone therapy

CAN IT BE CURED?
Sometimes - treatable causes may restore puberty

IS IT AN EMERGENCY?
Sometimes - severe headache or sudden vision changes

LONG-TERM OUTLOOK
Usually good with timely, cause-based care

Overview

Puberty is when a child's body develops into an adult body. In girls, the first clear sign is usually breast development. A growth spurt follows, and menstrual periods commonly begin about two to three years later.

Delayed puberty means these changes have not started at the expected age or have started but are not progressing. Assessment is generally recommended if there is no breast development by age 13, or if periods have not begun by age 15 or within about three years of breast development.

These age points guide assessment but do not diagnose a cause. Puberty timing varies between people and families. Pubic or underarm hair does not necessarily mean breast and ovarian development has begun because different hormones control these changes.

Some girls are healthy "late bloomers." Others have delayed puberty because of low energy intake, chronic illness, hormone problems, or ovaries that do not work as expected. Identifying the cause supports growth, bone strength, emotional wellbeing, and reproductive health.

Here, "girls" refers to young people being assessed for female-pattern puberty. Individual bodies, gender identities, and care needs differ.

Symptoms

The main sign is little or no breast development by age 13. Other signs include:

Weight loss, restricted eating, intense exercise, stomach problems, tiredness, or chronic illness may suggest that hormone signals are being suppressed. A poor sense of smell can occur with certain inherited hormone conditions.

Headaches, vision changes, excessive thirst, or unusual nipple discharge may indicate a pituitary gland problem. The pituitary, located beneath the brain, helps control puberty.

Some girls with Turner syndrome are shorter than expected or have subtle physical features. Normal breast development without periods may instead be related to pregnancy, a hormone condition, or a difference in the development of the uterus, cervix, or vagina.

- No menstrual period by age 15
- No period within about three years of breast development
- Puberty beginning but then making little or no progress
- A later or smaller growth spurt than expected

Causes and risk factors

A common cause is constitutional delay of growth and puberty. Puberty starts late but may then progress normally. Close relatives may also have had late puberty, growth spurts, or periods.

Puberty begins when the brain signals the pituitary gland to release LH and FSH. These hormones stimulate the ovaries to produce estrogen. Delays can occur anywhere along this pathway.

Low hormone signals from the brain may be associated with:

Sometimes the brain sends appropriate signals but the ovaries cannot respond normally. This is called primary ovarian insufficiency. Causes include Turner syndrome, autoimmune or

genetic conditions, and damage from some cancer treatments. Sometimes no cause is identified.

Body size, health, medicines, family development patterns, and previous chemotherapy or radiation can affect puberty. Delayed puberty is not the young person's fault.

- Not eating enough to meet energy needs
- Significant weight loss or an eating disorder
- Intensive exercise without enough nutrition and recovery
- Coeliac disease, inflammatory bowel disease, or other chronic illness
- Thyroid, kidney, hypothalamic, or pituitary conditions
- Certain inherited conditions

Diagnosis

Diagnosis combines growth history, signs of puberty, blood tests, and sometimes imaging or genetic testing.

A healthcare professional will ask about growth and breast development, whether puberty has progressed, and family puberty timing. They may also ask about eating, exercise, chronic symptoms, medicines, sense of smell, headaches, vision, and previous treatment.

Height and weight are plotted on a growth chart. A physical examination may assess breast development and other signs of puberty. It should be explained beforehand and performed with consent, privacy, and an appropriate chaperone.

Blood tests commonly measure LH, FSH, and estradiol. Results can indicate whether brain hormone signals are low or the ovaries are not responding. Other tests may check thyroid function, prolactin, anaemia, inflammation, or coeliac disease. A pregnancy test may be offered confidentially when pregnancy is possible.

An X-ray of the left hand and wrist estimates bone age, or bone maturity. Delayed bone age is common in constitutional delay but does not prove the cause.

A pelvic ultrasound may examine the uterus and ovaries. Chromosome testing may be considered if Turner syndrome or ovarian insufficiency is suspected. Brain imaging is usually reserved for abnormal pituitary results, severe headaches, vision changes, or other neurological symptoms.

Treatment and management

Treatment depends on the cause, age, growth pattern, bone health, and effect on daily life.

If constitutional delay is likely and the young person is otherwise well, regular monitoring may be enough. Growth and pubertal progress are reviewed over time.

A specialist may offer estrogen to start or support breast development and protect bones. Treatment usually begins at a low dose and increases gradually to imitate natural puberty. A progesterone-type hormone may be added later to support menstrual cycles and protect the uterine lining.

If the ovaries cannot produce enough estrogen, long-term hormone replacement may be needed to support bones, the uterus, sexual development, and general health. It replaces missing hormones but does not repair ovarian function.

When low energy availability, weight loss, or an eating disorder is suppressing puberty, treatment focuses on adequate nutrition and a safer balance of food, activity, and recovery. A dietitian and mental health professional may be involved. Treating coeliac disease, thyroid problems, or another underlying illness may allow puberty to progress.

Fertility care is separate from starting puberty. If ovarian function is reduced, a specialist can discuss fertility preservation or family-building options at an appropriate time.

Complications

Estrogen helps build bone during adolescence. A long delay can reduce bone mineral density, especially with poor nutrition or chronic illness. Treating the cause and restoring hormone levels can protect bone health.

Delayed puberty may affect confidence, body image, relationships, sport, and school participation. Clear information and emotional support are important.

Effects on adult height and fertility depend on the cause. Constitutional delay usually does not prevent fertility. Permanent ovarian or hormone-signal problems may make pregnancy more difficult, although fertility treatment or other family-building options may be available.

Prevention

Constitutional delay, Turner syndrome, and other inherited causes cannot usually be prevented.

Meeting nutrition and recovery needs may reduce some acquired causes, but delayed puberty

is not a matter of willpower. Eating disorders and chronic illnesses require appropriate medical care.

Before chemotherapy or radiation that could affect the ovaries, families can ask about effects on puberty and fertility. Fertility-preservation options are not suitable or available in every case, but discussing them before treatment may preserve choices.

Living with it and what to expect

In constitutional delay, puberty may begin later and then follow the usual stages. Follow-up remains important to confirm that development continues.

Hormone treatment produces gradual rather than immediate changes. Breast development, changes in body shape, and periods may emerge over several years. Early periods can be irregular.

Girls with permanent ovarian insufficiency may need long-term hormone replacement and ongoing reviews of bone and reproductive health. Puberty related to chronic illness may improve as the illness and nutrition come under better control.

Most young people can continue school, exercise, friendships, and daily activities during assessment and treatment. Adjustments may help with changing rooms, sport, or conversations about periods. Counselling or peer support may help if body differences cause distress.

Regular follow-up checks growth, pubertal progress, treatment effects, and emotional wellbeing. The plan may change as development continues or the cause becomes clearer.

When to get medical help

Arrange a routine medical appointment if:

Seek prompt medical advice for persistent headaches, vision changes, excessive thirst, frequent urination, or nipple discharge when not breastfeeding.

Get emergency help for a sudden severe headache with loss of vision, confusion, weakness, repeated vomiting, or collapse. Emergency care is also appropriate for fainting, chest pain, severe dehydration, or immediate safety concerns related to an eating disorder. Delayed puberty alone is not usually an emergency.

- Breast development has not started by age 13

- Periods have not begun by age 15
- Periods have not started within about three years of breast development
- Puberty began but has stopped progressing
- Growth has slowed or there has been significant weight loss
- Concerns are affecting eating, mood, school, or daily life

Common questions

What age counts as delayed puberty in girls?

Assessment is usually recommended if breast development has not started by 13. No period by 15, or within about three years of breast development, also needs assessment. These age points do not identify the cause.

Can stress delay puberty?

Severe or ongoing physical or emotional stress may affect hormone signals, especially if it changes eating, weight, sleep, or exercise. Other possible causes should still be assessed.

Will I still grow taller?

Many girls with delayed puberty grow for longer because their bones mature later. Final height depends on family height, bone age, nutrition, the cause, and treatment. Growth charts and bone-age X-rays provide guidance but cannot guarantee final height.

Does delayed puberty mean I cannot have children?

No. Constitutional delay usually does not prevent future fertility. Fertility may be affected if the ovaries or lifelong hormone signals do not work normally, and it cannot always be predicted during early adolescence.

Is hormone treatment safe?

Estrogen and later progesterone are established treatments when medically indicated. Treatment is introduced gradually and monitored for benefits and side effects. The safest form and timing depend on the young person's health, growth, uterus, and diagnosis.

Can periods be absent even if puberty is normal?

Yes. Normal breast development without a first period is called primary amenorrhoea. Causes include pregnancy, hormone conditions, and differences in the uterus or outflow tract. Medical assessment is still needed.

Sources

- Pediatric Endocrine Society. Delayed Puberty - Girls: A Guide for Families .
- Klein DA, Emerick JE, Sylvester JE, Vogt KS. Disorders of Puberty: An Approach to Diagnosis and Management . American Family Physician. 2017;96(9):590-599.
- Palmert MR, Dunkel L. Delayed Puberty . New England Journal of Medicine. 2012;366:443-453.
- Howard SR, Dunkel L. Delayed Puberty-Phenotypic Diversity, Molecular Genetic Mechanisms, and Recent Discoveries . Endocrine Reviews. 2019;40(5):1285-1317.
- Gordon CM, Ackerman KE, Berga SL, et al. Functional Hypothalamic Amenorrhea: An Endocrine Society Clinical Practice Guideline . Journal of Clinical Endocrinology and Metabolism. 2017;102(5):1413-1439.
- American College of Obstetricians and Gynecologists. Menstruation in Girls and Adolescents: Using the Menstrual Cycle as a Vital Sign . Committee Opinion No. 651.