CONDITION

Short stature

Short stature means being noticeably shorter than most people of the same age and sex.

WHAT IT IS
Height well below the expected range for age

BODY SYSTEM
Bones and growth

MAIN SYMPTOMS
Short height, slow growth, delayed puberty, reduced growth spurts

WHAT CAUSES IT
Inherited traits, growth timing, illness, hormone or genetic conditions

HOW IT IS DIAGNOSED
Repeated height measurements plotted on growth charts

MAIN TREATMENT
Monitoring and treatment of any underlying cause

CAN IT BE CURED?
Sometimes - treatable causes may improve growth

IS IT AN EMERGENCY?
No - assessment is usually routine

LONG-TERM OUTLOOK
Most remain healthy; adult height reflects the cause

Overview

Short stature means that a person is much shorter than most people of the same age and sex. In children, it is often defined as a height below the third percentile or more than two standard deviations below average on an appropriate growth chart. A percentile compares a child with other children of the same age and sex.

Short stature is a condition or physical characteristic, not a disease by itself. Many short children are healthy. They may have inherited shorter height from their parents or may grow later than their peers.

In some cases, slow growth is the first sign of a health, hormone, nutritional, or genetic condition. This is why the pattern of growth matters as much as a single height measurement. A child who stays on a low percentile may be growing normally, while a child who drops across percentiles may need further assessment.

For adults, short stature usually reflects childhood growth and cannot be changed through medicines once the growth plates in the bones have closed.

Symptoms

Short stature itself usually does not cause physical symptoms. The main sign is being shorter than expected for age, sex, family pattern, and stage of puberty.

Possible signs in a child include:

Other symptoms may point to an underlying cause. These can include ongoing abdominal pain or diarrhoea, poor appetite, tiredness, headaches, excessive thirst, frequent urination, joint symptoms, or repeated infections.

Body proportions can also provide clues. Some conditions affect the arms, legs, spine, or head differently, while others cause proportionate short stature, where the whole body is smaller but normally shaped.

- Growing more slowly than expected over several months or years
- Wearing the same clothing or shoe size for longer than peers
- Falling to lower percentiles on a growth chart
- Starting puberty later than most peers

Causes and risk factors

A common cause is familial short stature . This means a child has inherited genes linked with shorter height. Growth usually continues at a normal rate, but along a lower percentile. Puberty generally occurs at the expected time.

Another common pattern is constitutional delay of growth and puberty . Children with this pattern are often shorter than their peers during childhood and begin puberty later. Their bone development is delayed, so they may continue growing after many peers have stopped. Some catch up partly or fully, but their final height cannot be predicted with certainty.

Other possible causes include:

Emotional or social stress combined with inadequate nutrition or care can also affect growth in some children. Most short children, however, do not have a serious medical condition.

Risk is influenced by parental height, birth size, pregnancy history, nutrition, chronic illness, puberty timing, and certain medicines. Short parents are more likely to have short children,

although family height does not rule out a separate medical cause.

- Being born small for the length of pregnancy and not showing expected catch-up growth
- Not getting enough energy, protein, vitamins, or minerals
- Conditions that affect nutrient absorption, such as coeliac disease
- Long-term heart, lung, kidney, blood, or inflammatory disease
- An underactive thyroid gland
- Growth hormone deficiency or other pituitary gland problems
- Genetic or chromosome conditions, including Turner syndrome
- Conditions affecting bone or cartilage development
- Medicines that can slow growth, including prolonged systemic corticosteroid treatment

Diagnosis

Short stature is confirmed by accurate height measurements plotted on a suitable growth chart. One measurement cannot show how quickly a child is growing, so measurements taken over time are important.

For children under 2, length is usually measured while lying down. Older children are measured standing without shoes using a fixed measuring device. Weight, head size in younger children, body proportions, and stage of puberty may also be recorded.

The assessment may cover:

A clinician may estimate the height expected from parental heights. This is only a broad guide, not a guarantee of adult height.

A bone-age X-ray , usually of the left hand and wrist, can show how mature the bones are compared with the child's age. Delayed bone age may suggest that more growing time remains. It cannot predict final height exactly.

Blood or urine tests are selected according to the growth pattern and other findings. They may check blood counts, kidney and liver function, inflammation, thyroid function, coeliac disease, or substances linked with growth hormone activity. Genetic testing may be considered when there are unusual body features, developmental differences, a strong family pattern, or unexplained marked short stature.

Growth hormone deficiency cannot be diagnosed from a random growth hormone blood level. Specialist assessment may include stimulation testing and, in selected cases, an MRI scan of the pituitary gland and nearby brain structures.

- Birth weight, length, and pregnancy history
- Previous height and weight records
- The heights and puberty timing of close family members
- Eating patterns and digestive symptoms
- Long-term health conditions and medicines
- Signs of puberty and general development

Treatment and management

Treatment depends on why growth is limited. A healthy child growing steadily within the family pattern may only need periodic measurements and reassurance.

If nutrition is inadequate, support focuses on providing enough balanced food and treating feeding or absorption problems. Vitamins or supplements help only when a deficiency or specific nutritional need is present. They do not make a well-nourished child taller than their biological potential.

Treating an underlying condition can improve growth. Examples include treatment for coeliac disease, an underactive thyroid, inflammatory disease, or another long-term illness. Growth may not fully catch up, especially if the condition was present for a long time.

Recombinant human growth hormone is a laboratory-made version of natural growth hormone. It is used for certain diagnosed conditions and, in some countries, selected cases of otherwise unexplained short stature. It is given by injection over a long period and requires specialist monitoring.

Response to growth hormone differs between people. It may increase growth rate and final height, but it does not guarantee an average adult height. Possible burdens and adverse effects, the likely benefit, and the person's preferences need to be considered.

Some young people with substantially delayed puberty may receive specialist hormone treatment to help start puberty. This is not suitable for every child with late growth.

Emotional support can be as important as height-focused treatment. Parents, schools, and sports groups can help by using age-appropriate expectations and addressing teasing without treating short stature as a personal failing.

Limb-lengthening surgery is a major procedure with significant risks and a long recovery. It is not routine treatment for otherwise healthy short stature.

Complications

Healthy short stature does not usually cause medical complications. Physical ability, intelligence, fertility, and lifespan are generally determined by the underlying health condition rather than height alone.

Short children and adults may experience teasing, unwanted attention, or practical problems with clothing, furniture, driving, or reaching objects. These experiences can affect confidence, but emotional difficulties are not inevitable.

The main medical concern is missing an underlying condition that also needs treatment. Some causes can affect puberty, bone strength, metabolism, vision, fertility, or other organs.

Treatments can also have risks. Children receiving growth hormone or puberty-related hormone treatment need planned follow-up to monitor growth, general health, and possible adverse effects.

Prevention

Inherited short stature and constitutional delay cannot be prevented. Genetic conditions affecting growth are also not caused by anything a child or parent did.

Not every case related to illness can be prevented. Good management of long-term conditions, adequate nutrition, and review of medicines that may affect growth can help support a child's growth potential.

Regular growth measurements help identify slowing growth early. They do not prevent short stature, but they can lead to earlier recognition of a treatable cause.

Living with it and what to expect

A child's future growth depends on the cause, current growth rate, bone maturity, puberty timing, and family height pattern. Predictions are estimates rather than promises.

Children with familial short stature usually continue growing along a lower percentile and remain shorter as adults. Those with constitutional delay often grow for longer and may narrow some of the height difference during late adolescence.

If a medical condition is found and treated, growth may speed up. The amount of catch-up growth is different for each child. Once growth plates close near the end of puberty, medicines cannot make the long bones grow taller.

Follow-up may involve measurements every few months rather than frequent testing. A stable growth rate can be reassuring even when height remains below average. New symptoms, a slowing growth rate, or delayed puberty may lead to further assessment.

Most people with short stature attend school, work, exercise, have relationships, and live independently. Practical adaptations, such as step stools or adjusted workspaces, may help. Support should focus on health and participation, not only the number on a height chart.

When to get medical help

Arrange a routine appointment if a child appears much shorter than peers, is below the lowest lines on a growth chart, or has not had height measured accurately over time.

Assessment is also appropriate if the child:

Seek prompt medical advice for short stature accompanied by persistent headaches, changes in vision, repeated vomiting, marked thirst and urination, or new weakness. These symptoms do not usually result from short stature, but they may point to an underlying condition.

Seek emergency care for a severe sudden headache, loss of vision, confusion, fainting, trouble breathing, a seizure, or severe weakness. Short stature alone is not an emergency.

- Is dropping across height percentiles
- Is growing much more slowly than before
- Has poor weight gain or unexpected weight loss
- Has ongoing digestive, breathing, kidney, joint, or fatigue symptoms
- Shows no signs of puberty by the expected age range
- Has body proportions or physical features that seem unusual
- Was born small and has not shown expected catch-up growth

Common questions

What height counts as short stature?

In children, short stature often means height below the third percentile or more than two standard deviations below average for age and sex. Growth pattern, family height, and puberty stage are also important, so a percentile alone does not identify the cause.

Will my child catch up in height?

Some children catch up, especially those with delayed growth and puberty or a treatable cause. Others continue along a lower percentile and remain short as adults. Bone age and growth records can help estimate future growth, but no method predicts adult height exactly.

Can vitamins or special foods make a child taller?

They can support normal growth when a child has poor nutrition or a diagnosed deficiency. Extra vitamins, protein products, or "height growth" supplements do not increase height beyond biological potential in a well-nourished child. Some products sold for height have not been shown to work.

Does every short child need growth hormone?

No. Most short children do not have growth hormone deficiency, and many need only monitoring. Growth hormone is used for specific conditions after specialist assessment. Its benefit differs between people, and treatment involves regular injections and follow-up.

Is growth hormone treatment safe?

It has an established role for approved conditions, but it can cause adverse effects and is not suitable for everyone. Monitoring may include growth, puberty, blood tests, and checks for symptoms such as persistent headache or hip and knee pain. A specialist can explain the expected benefit and treatment burden for the diagnosed condition.

Is short stature a disability?

Short stature alone is not always considered a disability. Some people have no important limits, while others face practical barriers or have an underlying condition that affects daily activities. Legal definitions and eligibility for support differ by location and by the effect on everyday life.

Sources

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