

# Short Stature: A Guide for Families

## What is short stature?

The term short stature refers to any child who has a height well below the average for age and sex. The term is most commonly applied to children whose height, when plotted on a growth curve in the pediatrician's office, is below the line marking the 3rd or the 5th percentile.

## What is a growth chart?

The growth chart uses lines to display an average growth path for a child of a certain age, sex, and height. Each line indicates a certain percentage of the population that would be that particular height at a particular age. A boy with a height that is plotted on the 25<sup>th</sup> percentile line, for example, indicates that approximately 25 out of 100 boys his age are shorter than him. Children often do not follow these lines exactly, but most of the time their growth over time is roughly parallel to these lines. A child that has a height plot that is below the 3% line is considered to have short stature compared with the general population.

## What kind of growth pattern is abnormal?

Growth specialists take many things into account when assessing your child's growth. For example, the heights of a child's parents are an important indicator of how tall a child is likely to be when fully grown. A child born to parents who are below average height will most likely grow to have an adult height below average as well. The rate of growth, referred to as the growth velocity, is also important. Children who are not growing at the same rate as their friends will slowly drop further down on the growth curve as they age; for example, crossing from the 25<sup>th</sup> to the 5<sup>th</sup> percentile line. Such crossing of percentile lines on the growth curve is often a warning sign of an underlying medical problem affecting growth.

## What causes poor growth or short stature?

Although slower than normal growth may be a sign of a significant health problem, most children who have short stature have no medical condition, are healthy, and grow at a normal rate. Causes of short stature not associated with recognized diseases include:

- Familial short stature (one or both parents are short, but the child's rate of growth is normal)
- Constitutional delay in growth and puberty (the child is short during most of childhood but will have late puberty and end up in the normal height range as an adult).
- Idiopathic short stature (no identifiable cause, but the child is healthy)

Short stature may occasionally be a sign that a child does have a serious health problem, but there are usually clear

symptoms suggesting something is not right. Medical conditions affecting growth may include:

- Chronic medical conditions affecting nearly any major organ, including heart disease, asthma, celiac disease, inflammatory bowel disease, kidney disease, anemia, and bone disorders
- Hormone deficiencies, including hypothyroidism, growth hormone deficiency, diabetes, and Cushing disease, in which the body makes too much hydrocortisone.
- Genetic conditions including Down syndrome, Turner syndrome, Russell-Silver syndrome, Noonan syndrome and rare bone problems, such as achondroplasia. There are standardized growth charts available for some syndromes such as Down syndrome, Noonan syndrome, Turner syndrome, Russell-Silver syndrome and others (<http://onlinelibrary.wiley.com/doi/10.1002/9780470696286.app1/pdf>).
- Poor nutrition.
- Babies with a history of being born small (small for gestational age or with a history of intrauterine growth retardation).
- Medications, such as those used to treat attention-deficit/hyperactivity disorder and inhaled steroids used for asthma.

## What tests might be used to assess my child?

The best "test" is to monitor the child's growth over time using the growth chart. Six months is a typical time frame for older children, and if the rate of growth is clearly normal, no additional testing may be needed. In addition, your doctor may check your child's bone age (x-ray of left hand/wrist), which may help in a child older than 7 years predict how tall the child will be as an adult. Blood tests are rarely helpful in a mildly short but healthy child who has is growing at a normal growth rate; a child growing along the 5th percentile, for example. However, if the child is below the 3rd percentile or is growing more slowly than normal, doctors will usually do some tests to look for signs of one or more of the medical conditions described above.

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