

## Short Stature: A Guide for Families

### What is short stature?

*Short stature* refers to any child who has a height well below what is typical for that child's 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 third or fifth percentile.

### What is a growth chart?

A *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 who would be that particular height at a particular age. If a boy's height is plotted on the 25th percentile line, for example, this indicates that approximately 25 out of 100 boys his age are shorter than him. Children often do not follow these lines exactly, but most often, their growth over time is roughly parallel to these lines. A child who has a height plotted below the third percentile line is considered to have short stature compared with the general population. The growth charts can be found on the Centers for Disease Control and Prevention Web site at <https://www.cdc.gov/growthcharts/data/set1clinical/set1bw.pdf>.

### What kind of growth pattern is atypical?

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 have 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. A child who is not growing at the same rate as that child's friends will slowly drop further down on the growth curve as the child ages, such as crossing from the 25th percentile line to the fifth 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 short stature?

Although growth that is slower than a child's friends may be a sign of a significant health problem, most children who have short stature have no medical condition and are healthy. 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* (A child is short during most of childhood but will have late onset of puberty and end up in the typical height range as an adult because the child will have more time to grow.)

- *Idiopathic short stature* (There is 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 can include:

- Chronic medical conditions affecting nearly any major organ, including heart disease, asthma, celiac disease, inflammatory bowel disease, kidney disease, anemia, and bone disorders, as well as patients of a pediatric oncologist and those with growth issues as a result of chemotherapy
- Hormone deficiencies, including hypothyroidism, growth hormone deficiency, diabetes
- Cushing disease, in which the body makes too much *cortisol*, the body's stress hormone or prolonged high dose steroid treatment
- Genetic conditions, including Down syndrome, Turner syndrome, Silver-Russell syndrome, and Noonan syndrome
- Poor nutrition
- Babies with a history of being born small for gestational age or with a history of fetal or intrauterine growth restriction
- Medications, such as those used to treat attention-deficit/hyperactivity disorder and inhaled steroids used for asthma

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

The best "test" is to monitor your child's growth over time using the growth chart. Six months is a typical time frame for older children; if your child's growth rate is clearly normal, no additional testing may be needed. In addition, your child's doctor may check your child's bone age (radiograph of left hand and wrist) to help predict how tall your child will be as an adult. Blood tests are rarely helpful in a mildly short but healthy child who is growing at a normal growth rate, such as a child growing along the fifth percentile line. However, if your child is below the third percentile line or is growing more slowly than normal, your child's doctor will usually perform some blood tests to look for signs of one or more of the medical conditions described previously.

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