

# Growth Disorders

BIRTH DEFECT RESEARCH FOR CHILDREN



## What are Growth Disorders?

Growth disorders are problems in infants, children, and teenagers that prevent them from attaining realistically expected growth. These disorders include failure to gain height and/or weight in children and delayed sexual development in teenagers.



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How many children have Growth Disorders?

It is estimated that 10,000-15,000 children in the United States have growth failure due to Growth Hormone Deficiency. Hypothyroidism, which affects bone growth, occurs in one in 4,000 births. Estimates of the occurrence of some types of Dwarfism include one in 14,000-20,000 births for Achondroplasia, one in 95,000 births for Spondylo-Epiphyseal Dysplasia, and one in 110,000 births for Diastrophic Dysplasia.

How do you know if your child has a Growth Disorder?

Some growth disorders can be recognized at birth. Others may be noticed when you compare your child to other children of the same age. You may also notice that your child is not outgrowing his clothes or is growing less than two inches per year. If you suspect a problem, you should talk to your child's doctor. He may suggest a thorough medical examination by a pediatric endocrinologist or other specialist. When evaluating your child, a doctor may consider your child's and your family's growth history, details of your pregnancy, your child's general health, your child's development (in walking, talking, etc), and your child's habits. Testing may include blood and urine tests, bone-age X-rays, scans of your child's pituitary gland or other organs, and growth hormone stimulation testing.

What causes Growth Disorders?

Short stature and growth disorders may be due to heredity, delayed growth, nutritional problems, illness and systemic (affecting the whole body) disease, endocrine disease (hormone deficiency or excess), and/or congenital (present at birth) factors.

What are the most common Growth Failures/Disorders?

Variations in the normal pattern of growth include:

**Familial Short Stature:** These children are small for their age, growing at a normal rate, show no signs or symptoms of disease that affect growth, and have parents and other family members who are short. Due to heredity, these children will reach an adult height similar to their parents.

**Constitutional Growth Delay:** These children are small for their age, are growing at a normal rate, are late entering puberty, have a delayed bone age compared to their chronological age, and show no signs or symptoms of disease that affect growth. These children reach puberty later than their peers but reach normal sexual development and height by adulthood. Constitutional Growth Delay often runs in families with one or both parents or other relatives termed "late-bloomers."

Abnormal patterns of growth include:

**Nutritional Problems:** Malnutrition is the most common cause of growth failure worldwide. Gastrointestinal diseases can cause food to be improperly absorbed leading to lack of nutrients and energy from food. Symptoms can include weakness, frailty, nausea, vomiting, diarrhea or constipation, and muscle or bone tissue wasting. These diseases can be treated by special diets. Children usually grow normally after proper diagnosis and treatment.

**Systemic Diseases:** Diseases of the heart, lungs, and kidneys may lead to growth failure due to inadequate nutrients or buildup of waste and other undesirable substances in the body. Any disease that is untreated, severe, or poorly controlled can adversely affect growth.

**Endocrine diseases:** Growth Hormone Deficiency involves the



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pituitary gland. A deficiency of growth hormone can occur any time during infancy or childhood when the pituitary gland doesn't produce enough hormones for normal growth. Deficiencies are usually due to damage or malfunction of the pituitary gland. This disease may be genetic in some families. It can be treated with injections of growth hormone.

Hypothyroidism occurs when the thyroid gland doesn't produce enough thyroid hormone for normal bone growth. It can retard growth and brain development. It can occur at any time and could completely stop a child's growth. A child can return to normal growth development when taking medication for this disease. Cushing's Syndrome, which is very rare, is caused by too much cortisol, a stress hormone. A child's weight will often increase while his height stays the same. It can also cause muscle wasting and weakness. Treatment varies depending on the cause. Early diagnosis is important to increase the likeliness of the child returning to normal growth development.

**Congenital Conditions:** Intrauterine Growth Retardation (IUGR) means slow growth within the uterus. These full-term babies are unusually small in terms of weight and length. They likely will remain small throughout their lives since there is no effective treatment for increasing their height. Russell Silver Syndrome is a type of IUGR characterized by asymmetry of the extremities, large head with triangular-shaped face, and possible webbing of the toes. Usually the triangular-shaped facial features will lessen with the passage of time. Also surgery can correct the webbing so these children can typically live normal lives.

Skeletal Dysplasia or Chondrodystrophy, caused by an abnormal formation and growth of bone and cartilage, results in short and abnormal body proportions. This disorder is also referred to as Dwarfism. Children with this disorder have normal intelligence. The most common form of this bone disorder, evident at birth, is Achondroplasia, which results in disproportionately short arms and legs with a normal size trunk. There are over 100 types of

Skeletal Dysplasias. These conditions are generally untreatable although some people have undergone limb-lengthening surgery.

There are many genetic syndromes associated with short stature and growth disorders. One of the most common, Turner's Syndrome, occurs in girls as a result of a missing or abnormal X-chromosome. Characteristics include short stature, underdeveloped ovaries, and failure to mature sexually. Available treatment includes human growth hormone injections to improve growth and estrogen replacement therapy to promote development of sexual characteristics.

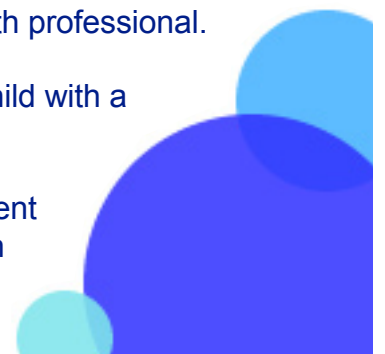
How can you help a child with a Growth Disorder?

Early diagnosis and treatment of some conditions may help children achieve a more normal growth. Growth hormone injections can be used to treat some growth deficiencies associated with kidney diseases, Turner's Syndrome, and Growth Hormone Deficiency. Thyroid hormone replacement therapy can be used for Hypothyroidism. Estrogen replacement therapy can be used in Turner's Syndrome treatment. Surgery can correct webbing in children with Russell Silver Syndrome and limb-lengthening surgery has been successful for some children with Skeletal Dysplasia.

Your child's doctor will be able to discuss the available treatment for your child's condition. Family and adults can help a child's social and emotional adjustment by using positive reinforcement to increase his self-esteem, appreciating his talents, personality, and intelligence, and de-emphasizing appearance as a measure of social acceptance. Some children may benefit from evaluation and treatment by a mental health professional.

What's in the future for a child with a Growth Disorder?

Early diagnosis and treatment is important to help children achieve a more normal growth. Research is being



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done to better understand the causes of growth disorders and to develop more accurate ways of diagnosing them. Advances in technology may provide additional and improved treatments for growth disorders. Children with growth disorders will face challenges not generally encountered by average-sized individuals. Yet, as a result of past and ongoing research, advances in technology, and social and emotional support, most children with growth disorders can expect to lead healthy and productive lives.

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