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When is being short a medical problem?

"Short stature" is not a medical diagnosis. It is a descriptive term for a person whose height is considered significantly below the normal range of measurements for that age, gender, racial group or family.

Short stature is also a statistical term, generally referring to people who are shorter than ninety-seven percent of their age and sex matched peers. Thus, in any population, nearly three out of each hundred persons will meet this statistical definition, most with no discernible medical abnormality.

Height is influenced by a wide variety of factors such as culture, gender, family background, and psychological state. Because our culture often equates height with social status or "stature," relatively short stature is often perceived to be a disability, especially in males. Severe short stature (below five feet, for example) can also represent a major physical disability in terms of the ability to drive, reach for objects, and perform ordinary daily tasks that the person of average height takes for granted.

What medical conditions cause short stature?

A variety of medical conditions can impair growth and result in pathological short stature. Chronic illness in children - especially illness affecting the heart, lungs, intestines, or kidneys - can slow growth. The recognition and proper treatment of the underlying condition is the most effective means to restore growth in these children. Inadequate nutrition also can impede the attainment of adequate height, especially when it occurs during infancy and puberty. Rarely, significant psycho-social stresses can impede the rapid growth usually seen in infancy.

A small subgroup of children may suffer from an insufficient production of hormones that are essential for growth. Two hormones often involved are thyroid hormone and growth hormone. Specific treatments are available for these children.

Short stature may occur as a result of genetic disorders that affect the growth of the skeleton. In girls, a cause of unexplained growth failure in approximately 1 of every

2,000 female births is the genetic condition called Turner's syndrome. In this syndrome, the absence of all or part of one sex chromosome is associated with impaired growth and ovarian failure and requires treatment through hormonal replacement.

What variations occur in normal growth?

Children whose parents are relatively short will probably find themselves in the lower portions of the growth charts throughout their lives. Many other children who are short for their age will be normal in height as adults and have no disorder other than some delay in the timing of their growth.

These "late bloomers" are frequently young men, often with a family history of "late bloomers." In most cases, treatment is unnecessary. Where the rate of growth is significantly slow and the child is experiencing psychosocial problems, hormonal therapy can safely accelerate natural growth and "jump start" adolescence.

What is the role of endocrinology?

Research in basic and clinical endocrinology focuses on defining the spectrum of normal and abnormal growth patterns, increasing understanding of the mechanisms underlying growth, and developing safe and effective treatments for people whose growth is severely impaired.

- Endocrine research has established that hormones produced by the pituitary gland control the rate of growth and the timing of adolescence. Further research has demonstrated that these hormones are released into the blood in an intricate fashion that normally changes with age and the time of day. The release of growth hormone in children often occurs at night, during sleep.
- Basic research in molecular endocrinology has developed methods for producing growth hormone in sufficient quantities to treat children with serious growth disorders. Previously limited in supply, growth hormone is now produced through biotechnology, in amounts adequate to treat all children with growth hormone deficiency.
- Basic and clinical research has defined the mechanisms responsible for growth acceleration during sexual development as well as the disturbances responsible for abnormally early (precocious) puberty. In children with precocious puberty, endocrine research has provided safe and effective treatment to stop the process and restore normal growth, thus permitting these children to achieve relatively normal adult height.
- Clinical research by endocrinologists has demonstrated that some children successfully treated for leukemia and brain tumors may acquire subtle abnormalities in hormone release by the pituitary gland, which result in reduced adult height. Modified treatments have been developed to preserve hormonal function while successfully treating the underlying malignancy. Even when the necessary treatment disturbs the control of hormone secretion, timely recognition and hormone therapy can lead to the achievement of expected adult height.

- Endocrinologists are carefully evaluating the potential of growth hormone therapy for children who are extremely short, but who do not have a demonstrable deficiency of growth hormone. This therapy remains experimental and should be conducted only under the supervision of a specialist in pediatric endocrinology.