



# Encyclopedia of Obesity

## Growth Hormone

Contributors: Evan Berk

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Growth hormone is a hormone that is produced in the pituitary glands and has anabolic (promoting growth) effects on the body. Growth hormone is critical for normal growth and development of cells. Growth hormone's primary functions include stimulating protein synthesis, increasing blood sugar, maintaining calcium levels, promoting muscle growth, helping fat utilization, and stimulating the immune system.

Growth hormone has long-term effects from promoting the regulation of growth. Levels of this hormone are elevated in children and progressively decrease as a person gets older. One pathway that growth hormone works through uses two compounds known as insulin-like growth factors I and II (IGF-1 and IGF-II). These compounds play a role in enhancing the message of growth hormone in the pathway for protein synthesis. When fasting blood glucose (sugar) levels are low, growth hormone will play a role in helping to increase the glucose levels, but is not responsible for the immediately rise. Growth hormone can also stimulate the levels of a certain enzyme, 1-alpha-hydroxylase, in the kidney, which leads to an increase in vitamin D levels. This in turn will increase calcium absorption and lead to growth of cartilage and bone in the body.

Elevated levels of growth hormone are associated with two conditions: acromegaly, and pituitary gigantism. Several of the clinical symptoms associated with acromegaly include thickening of bones (noticeable in fingers, toes, and the jaw), visual problems and disorders within the cardiovascular (high blood pressure and cardiac myopathy), pulmonary (sleep apnea or narcolepsy), renal (elevated sodium retention), endocrine, and metabolic (low thyroid activity, lower sex hormones, diabetes mellitus, high triglycerides) systems. Pituitary gland tumors are the cause of acromegaly. This disease develops in adulthood. When a pituitary gland tumor is present in children, it will lead to excessive growth, known as pituitary gigantism. Treatment of these disorders involved removing the pituitary gland. Children who have their pituitary gland removed are given synthetic growth hormone at normal levels. Adults who have their pituitary gland removed have traditionally not been given growth hormone. Recent research has shown that supplementation with growth hormone in adults is associated with increased muscle growth, decreased body fat, and an improved general overall feeling.

Growth hormone deficiency is a lack of growth hormone. In children, this condition is associated with decreased growth. Adults may also suffer from a growth hormone deficiency, although it is not completely understood what the consequences from a lack of growth hormone are. It is believed that it may be associated with problems associated with the heart, bone strength, and general energy. To treat growth hormone deficiency, patients are given injections of a synthetic growth hormone. Prader-Willi syndrome is a genetic disorder in which children eat excessively and are short. Growth hormone is the recommended therapy for patients with Prader-Willi syndrome. Some children who used growth hormone therapy to treat their Prader-Willi syndrome have died while on the therapy. This might have been related to growth hormone's effect on respiratory functions. Some researchers recommend testing for respiratory function prior to beginning growth hormone therapy.

- growth hormone
- hormones
- pituitary gland
- Prader-Willi syndrome

- hormone therapy
- pituitary tumor
- synthetic hormones

Evan Berk, Ph.D. New York Obesity Research Center, St. Luke's Hospital, Columbia University

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See Also:

- [Metabolic Disorders and Childhood Obesity](#)
- [Prader-Willi Syndrome](#)

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