by Jeffry S. Life, M.D., Ph.D. and Alan P. Mintz, M.D.

Human growth hormone, also called somatotropin, is the most abundant hormone produced by the pituitary gland. Growth hormone is clearly our master hormone because of its ability to affect all other hormones, organs and the cells of our body. It has truly amazing reparative and restorative powers that can reverse cellular and tissue damage and even help re-grow failing organs—something that no other hormone can do. Growth hormone is responsible for growth and healing, immune function, increasing muscle mass and strength, minimizing body fat, controlling cholesterol levels and maintaining high energy levels including sexual energy and sexual performance. It also increases bone strength and prevents osteoporosis. Growth hormone is released from the pituitary in pulses mostly at night when we sleep and to a lesser degree during the day. Many factors can affect growth hormone levels including exercise, stress, emotional excitement, diet and aging.

Growth hormone can influence many different types of cells in our bodies, but its main target is the liver. Growth hormone’s action on the liver causes it to produce another hormone called insulin-like growth factor-1 or IGF-1. This hormone is very similar to the chemical structure of insulin and actually competes with insulin for the same sites on all of our cells. IGF-1 is an extremely important hormone and does most of the work we attribute to growth hormone. Blood tests to measure GH levels are best performed by measuring IGF-1 concentrations since GH levels remain steady in our circulation, whereas GH has peaks and valleys throughout the day and night.

After age 30 GH levels begin falling at the rate of 15 percent per decade for reasons that remain poorly understood. By age 60 most of us produce only 25 percent of the growth hormone we produced at age 21. We now know that this age-related decline in growth hormone we all experience brings about many undesirable changes, including an increase in body fat—especially abdominal and chest fat, a loss of muscle tissue, a decline in cardiac function and exercise performance, declines in mood and our sense of well-being, loss of bone strength and poor wound healing.

Aging, however, is not the only cause of declining growth hormone levels. Excess body fat also lowers growth hormone levels, creating a vicious cycle because low growth hormone levels make it easier to gain even more body fat—especially the fat in and around our belly. This abdominal fat is called central obesity and it has become very common in America—nearly 40 percent of us fall into this category. Central obesity is a very dangerous kind of fat that is associated with insulin resistance, type II diabetes, high cholesterol, heart disease, syndrome X and strokes.

The medical use of growth hormone has been, until recently, almost exclusively limited to pediatricians and pediatric endocrinologists for the treatment of growth-stunted children deficient in growth hormone. Today, declines in growth hormone in the adult population and the problems that accompany these declines no longer have to be an inevitable part of the aging process. In 1981, a synthetic form of human growth hormone was developed through genetic engineering that made it possible to grow bio-identical molecules from cell cultures using recombinant DNA. Subsequently, the FDA approved synthetic growth hormone for human use in the late 1980s. In August of 1996 growth hormone was approved by the FDA for use in the treatment of growth hormone deficiency in adults. As a result, growth hormone supplementation is now recognized as a treatment option for people of all ages who have deficiencies. More and more progressive physicians are advocating human growth hormone supplementation in older individuals to treat the age-related declines of this crucial hormone. The goal of treatment is to restore hGH levels to those of a 30- to 40-year-old and this can be achieved by giving very low doses of the hormone.

The supplementation of hGH is also greatly enhanced by following a low glycemic diet with plenty of high-quality protein and a good aerobic and resistance exercise program—all essential key ingredients to any hormonal supplementation program.

The signs and symptoms of growth hormone deficiency are the same as those of aging. Body composition shifts by increasing fat and body weight and decreasing muscle mass and energy levels. There is a decrease in bone mineralization, vitality wanes and there is increased cardiovascular disease and mortality. There are psychosocial deficits, impaired physical performance, poor sleep and a decrease in social interaction. In middle and late adulthood all people experience these problems. Until now, these changes in body composition and physiology have been considered unavoidable results of aging. Growth hormone supplementation can dramatically slow, prevent or even reverse all of this by working at the cellular level where it instructs cells to repair, heal and rejuvenate. Improvements in the muscle/fat ratio are achieved by decreasing body fat to 20 percent and increasing muscle tissue by 10 percent. Bone strength, brain function, enzyme production and the integrity of hair, nails and skin are also under the control of growth hormone and all dramatically improve with supplementation.

Additional benefits of hGH therapy include a resolution of depression and mood disorders, improvements in the quality of sleep, improved sense of well-being, improved self esteem, increased drive and initiative, improved memory, improved sex life and improved overall mental and physical health. Growth hormone also increases lipolysis or the breakdown of body fat and this decreases cholesterol and triglycerides levels, both serious risk factors for heart disease and diabetes. Exercise capacity, bone density, strength and cardiac output also improve. Skin rejuvenation occurs as a result of increased collagen and elastin. There is also a significant improvement.
in immunity, which is thought by many scientists to help prevent cancer and increase longevity.

Hormone optimization programs offered by Age Management Medicine physicians have rapidly moved into the forefront of preventive medical care and have greatly contributed to the enhancement of quality of life as men and women age. Daniel Rudman, M.D., is the individual who is credited with discovering the benefits of hGH in growth hormone deficient adults. His groundbreaking study was published in the July 1990 issue of the New England Journal of Medicine and it truly rocked the scientific and medical communities. He, and many others since, have shown that daily supplementation of growth hormone can reverse the signs and symptoms of the aging process and restore one to a more youthful physiology and body composition. The benefits and safety of GH replacement in GH-deficient adults have now been unequivocally demonstrated in studies lasting up to 10 years. Long-term studies are currently underway to determine whether these benefits will be sustained over a lifetime.

There are some downsides to taking hGH that everybody should know about before they consider a supplementation program. For one thing, much care needs to be taken to avoid excesses of hGH. Excess hGH levels can cause a number of problems including insulin resistance, diabetes, high blood pressure, carpal tunnel syndrome, fluid retention, heart disease and joint pain. Blood levels of IGF-1 must be monitored at regular intervals to make sure this doesn’t happen. A physician certified in Age Management Medicine should ideally be the one to manage hormonal augmentation programs. Growth hormone should be injected daily, usually six mornings a week, just under the skin (subcutaneous) with a very small needle, in the same fashion that a diabetic gives himself or herself insulin. All oral or topical forms of growth hormone and growth hormone secreting agents simply do not work. Another significant down side to hGH therapy is its cost. Synthetic human growth hormone is very expensive. Monthly costs can range from $350 to $1,000 and this doesn’t include lab costs and physician fees. Most insurance plans do not cover these costs even though studies have clearly demonstrated a 50 percent reduction in hospitalization rates for individuals who maintain optimal hGH levels and the fact that there is increasing evidence which demonstrates growth hormone deficiency in adults increases risks of death from cardiovascular disease. One final word of caution, before you consider an hGH supplementation program for yourself, you need to realize that any substance that causes cells to grow has the potential of causing cancer. Thus far, however, hGH therapy has not been linked to cancer and in fact, there are many investigators that believe optimal hGH levels play a significant role in actually preventing cancer.

Growth hormone supplementation is clearly a powerful tool in the fight against aging, especially when it is used in combination with a low glycemic nutrition program and an exercise program that includes both aerobic and resistance training. We must remember, however, that hGH is just one of several key hormones that all work together synergistically to improve quality of life, vitality, body composition and the health of individuals as they age. Hormonal balance is absolutely essential in the overall health and well-being of both men and women.

Today, age-related hormone deficiencies and imbalances are correctable. Optimal hormone balances that place individuals in the upper percentiles of their normal hormone ranges can be safely achieved when performed by a competent physician specifically trained and certified in Age Management Medicine. ■

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About Cenegenics
Cenegenics Medical Institute is the largest and most experienced Age Management Medicine Practice in the world with patients from every state in the United States and several countries, 25 percent of whom are physicians and their families. Cenegenics consistently receives regional, national and international media exposure and has been the featured expert in the media, including USA Today, Wall Street Journal, ABC’s “20/20,” and CBS’s “48 Hours.”

Cenegenics Physician Training Programs
Through the joint sponsorship of The Cenegenics Medical Institute and the Foundation for Care Management, Cenegenics provides American Medical Association PRA Level 4 Classification Tutorial Training in Age Management Medicine for physicians with a maximum of 50 Category 1 Continuing Medical Education (CME) Credits. Cenegenics also sponsors an Institutional Review Board (IRB) Research Protocol for Age Management Medicine with university affiliation. In addition, Cenegenics has the highest rating for a privately held entity with Dun & Bradstreet, Inc. because of their business ethics. For further background information, including biographies of their physicians, management team and medical advisory board, please visit www.Cenegenics.com.

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