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**Aging Well -- Part VI**
**Growth Hormone (HGH)**
**by James L. Holly, MD**
**Your Life Your Health**
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About one-third of the elderly population is deficient in Growth Hormone (HGH) and would benefit from replacement therapy. Thus far, when restoring HGH to normal physiological levels for a twenty-year-old person, no significant side effects have been identified. This is particularly true when the dosing is low and when the frequency of that dosing is high; a pattern referred to as “low dose/high frequency.” This generally means taking a small dose, six-days a week by subcutaneous injection, which presently is the only method with predictable results. When high doses are used several complications can occur such as carpal tunnel syndrome, gynecomastia and enlargement of the breast.

**HGH Secretion**

HGH release is at its peak when the body goes through the rapid growth phrase during adolescence. Most HGH secretion takes place in brief bursts, called "pulses," that occur during the early hours of the deepest sleep. Also, HGH is released as a result of vigorous aerobic and anaerobic exercise. The timing of HGH injections is such that it does not interfere with any potential physiological HGH release.

In humans, the amount of HGH after the ages of 21 to 31 falls about 14 percent per decade, so that the total twenty-four-hour HGH production rate is reduced by half by the age of 60. Humans produce about 500 micrograms of HGH daily at the age of 20, 200 micrograms at 40 and about 25 micrograms at eighty years of age. After the age of 60, 30% of apparently healthy men have this low amount. And, after age 65, 50% of the population is partially, or wholly deficient in HGH.

**HGH: How does it Work?**

Dr. Blackman at Johns Hopkins says of HGH's benefit in aging well, "We don't believe that any intervention is going o change the intrinsic maximum life span of people, but rather push people in a healthier fashion towards that maximum life span, which is somewhere between 110 and 120." HGH appears to be able to help people increase their individual life spans by decreasing their vulnerability to disease.

The body's immune defense system -- that is, the ability to fight viruses, bacteria, and cancer cells -- declines with age starting in adolescence. And, the processes required for the proper maintenance of tissue function, such as the ability to metabolize sugar, handle cholesterol

and clear the kidneys of toxins become progressively less efficient. All of this results in the chronic, degenerative, disabling and ultimately deadly diseases of aging.

**HGH and the Immune System**

HGH strengthens the body against disease by acting on both of these factors. One of the functions of HGH is to stimulate immune cells which destroy pre-cancerous cells before they can develop into a malignancy. Many observations have supported the thesis that HGH sustains and restores the effectiveness of the immune system.

The thymus gland, which is located behind the top of the breast bone, is a primary organ of the immune system. At about age 12, the thymus gland begins to shrink until by the age of 40, it is almost gone. The thymus is fundamental to the maturation of the T-cell lymphocytes, which are “foot soldiers” in the fight against disease. It is the loss of T-cells that makes AIDS patients vulnerable to the devastating diseases that finally kill them. With the shrinking of the thymus comes a rise in the diseases associated with aging, including cancer, autoimmune disease and infectious diseases.

In rats treated with growth hormone, the aging thymus began to regenerate. In addition, the T-cell count went up and the immune factors produced by those T-cells went up. No one is suggesting at this time that AIDS patients will benefit from HGH Hormone injections (although some studies are now on-going about treating AIDS in children with HGH), but the immune capacities of the human body which are diminished by aging can be restored with HGH.

**HGH and Malnutrition in the Elderly**

Growth hormone also reverses a kind of wasting due to malnutrition in the elderly. For unknown reasons, the appetite of old people often fades away to nothing, which has been called the "anorexia" of aging. Other elderly people may eat well but fail to thrive. As many as 65% of the elderly who are hospitalized and between 30% and 60% of those in nursing homes may be malnourished, not because of the withholding of food, but because of their bodies inability to use the food they eat, or because of their lack of appetite. Recent studies suggest that age-related reductions in the natural production of HGH contribute to malnutrition and frailty in the elderly.

**HGH and Cardiac Disease**

The central role of growth hormone in cardiac disease is seen by observing those with two little or too much -- both are dangerous. HGH deficiency contributes to an:

1. Increased abdominal obesity,
2. Increased cholesterol,
3. Increased risk of blood clots,
4. Increased blood pressure,
5. Increased insulin resistance.

All of these contribute to heart disease and all of them are benefited by the replacement of deficient Growth Hormone.

**HGH and the Water Composition of the Body**

The benefits of Growth Hormone in diabetes mellitus, osteoporosis, atherosclerosis, decreased mental function, body composition, skin thickness and many others are beyond the scope of this review. However one last area should be addressed and that is body water. The softness, smoothness and plumpness of a baby's skin are because about 90% of their body weight is water. By adulthood, the body water is down to 60%, and by the time we reach old age, it is a mere 40% of our total body mass.

Aging, in a very real way, is a drying-out process. However, growth hormone turns the "prune" back into a "plum" by restoring the body water. When assessing your body composition, one of the measurements SETMA providers will make is your total body water. We will recommend drinking more water, avoiding caffeinated drinks, coffee, and chocolate, etc, all of which contribute to osteoporosis. And, if you are deficient, we will recommend growth hormone injections. One of the benefits of restoring your body's growth hormone levels will be when your body water re-approaches 60%; your skin will become more youthful without cosmetic surgery.

**Taking the HGH Test**

To determine if you should consider yourself a candidate for HGH replacement therapy, take the following test: (the number following the question is the value you add if your answer is yes to that particular question)

| | | |
|---|---|---|
| 1. | Do you often feel tired? | -1 |
| 2. | Do you feel happy most of the time? | -2 |
| 3. | Do you often go through mood swings? | +2 |
| 4. | Do you anger easily? | +2 |
| 5. | Are you depressed often? | +1 |
| 6. | Do you often feel anxious or stressed? | +1 |
| 7. | Do you feel you work too hard? | +2 |
| 8. | Do you look forward to retirement? | +2 |
| 9. | Do you keep in touch with friends? | -1 |
| 10. | Do you maintain an interest in sex? | -1 |
| 11. | Is your sex life declining? | -1 |
| 12. | Do you have trouble falling or staying asleep? | +2 |
| 13. | Do you feel well rested after sleep? | -1 |
| 14. | Do you find yourself forgetting things? | +2 |
| 15. | Do you find it harder to think clearly? | +2 |
| 16. | Do you use memory aids (e.g. lists)? | +2 |
| 17. | Do you have problems concentrating? | +2 |
| 18. | Are you in poor physical shape? | +2 |
| 19. | Are you more than 20% over weight? | +2 |
| 20. | Is it very difficult for you to lose weight? | +1 |
| 21. | Have you developed a spare tire or love handles? | +1 |
| 22. | Does your musculature look youthful? | -2 |
| 23. | Do you feel your over all health is good? | -2 |

| | | |
|---|---|---|
| 24. | Do you often get colds or feel sick? | +2 |
| 25. | Do you commonly feel aches or pains? | +1 |
| 26. | Is your blood cholesterol over 200? | +1 |
| 27. | Is your blood cholesterol over 240? | +2 |
| 28. | Men -- is your HDL less than 45?<br>Women -- is your HDL less than 55? | +2 |
| 29. | Is your blood pressure normal? | -2 |
| 30 | Has your vision noticeably deteriorated? | +1 |
| 31. | Do you have frequent urination? | +1 |
| 32. | Do you have digestive problems? | +1 |
| 33. | Does the skin on your face, neck, upper arms and abdomen appear to hang? | +2 |
| 34. | Do you think you look older than your age? | +1 |
| 35. | Do you have cellulite on your thighs? | +1 |
| 36. | Do you need haircuts less frequently? | +1 |
| 37. | Does it seem to take a long time for cuts and bruises to heal or for wounds to close? | +1 |
| 38. | Is it getting harder to exercise? | +2 |
| 39. | Do you seem to have less strength for gripping or lifting? | +2 |
| 40. | Is your endurance less? | +2 |
| 41. | Is your breathing more labored when you exercise hard? | +3 |
| 42. | Do you find the longer you live, the better you feel about life? | -2 |
| | Ages 45-54 | +1 |
| | Ages 55-64 | +2 |
| | Ages 65 and above | +3 |
| Total | | ___ |

**Evaluating Your Score**

- **1-4 and below**: You are doing well and your complaints are well within normal range of daily living.
- **15-22**: HGH therapy may forestall some of the problems of aging.
- **23-30**: HGH replacement may reverse the problems of aging. Get your Growth Hormone levels checked.
- **31 and above**: Chances are that your levels of growth hormone are severely deficient. HGH replacement may be of great benefit.

As SETMA opens its, Lifetime Health and Wellness Program, it will be possible for you to find out if you are growth hormone deficient and if HGH replacement will help you achieve your health goals. Aging well, in fact, aging as well as you possibly can, will require you knowing if you are HGH deficient or not.

Remember, it is your life and it is your health.