Restoring Youth

The New Science of Human Growth Hormone Therapy

Dr. Richard Gaines

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Preface

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CHAPTER 1

Introduction to Human Growth Hormone Replacement Therapy

History of Growth Hormone Use

Benefits For Adults Were Not Discovered Until 1990.

Medical science knew about growth hormone in the 1920s, and isolated it in 1956, but it was not studied for 30 years. From 1956 to 1985, growth hormone was used only to treat childhood growth disorders. Doctors knew growth hormone was essential for children, but thought its benefits stopped after puberty.

Early Discoveries Related To HGH

The pituitary produces growth hormone to stimulate the release of insulin-like growth factor (IGF-1), also called somatomedin C. IGF-1 is responsible for most of the HGH benefits in children. Doctors now know IGF-1 is also directly involved in the benefits of growth hormone for adults.

The use of HGH was limited because it was not easily available. For 30 years, the only source was human cadavers. Growth hormone was extracted from the pituitary glands. The extraction process was difficult and expensive. This meant the benefits of pit-HGH (human derived HGH) could only be used for a small number of children with severe growth disorders.

In 1985, pit-HGH was taken off the market because it was thought to cause Creutzefeldt-Jakob disease, a brain disorder similar to mad cow disease. It turned out the problem was not HGH – it was that pit-HGH was contaminated by pathogens.

Landmark 1990 Study Shows Adults Benefits

In 1990, a study was published in the New England Journal of Medicine by Daniel Rudman, MD, with the Medical College of Wisconsin, on the use of growth hormone in a small group of elderly men. The study clearly showed HGH benefits — including increased muscle tone, loss of fat, and regenerated skin quality. This study has generated so many hits about the anti-aging benefits of HGH, it has been pulled from the New England Journal of Medicine website.

HGH benefits have also been validated by extensive clinical use in the treatment of AIDS patients. Many of the benefits of HGH in healthy adults are also seen in AIDS patients. HGH benefits include significant increases in muscle mass and energy, a higher quality of life and even prolonged longevity.

Early Adopters of HGH Therapy

In 2004, about 30,000 Americans (mostly celebrities and high-profile executives) used HGH the legal way -- with a

prescription. Another 100,000 (mostly bodybuilders) used it illegally from black market sources. This was the beginning of a broader movement to take advantage of the many benefits of growth hormone: more energy, more muscles, more hair, and of course more sex. Men quickly discovered the benefits of growth hormone.

Use Is Now Widespread

A study published in 2012 by Brian Brennan, M.D. of McLean Hospital and Harvard Medical School found that more than 1 and 10 men who go to the gym on a regular basis use growth hormone. So if the guy next to you in the locker room seems to be getting more out of his routines, growth hormone could be the reason.

SECTION 2

HGH and Hollywood

Growth hormone use in Hollywood is widespread, but celebrities are unwilling to publicly admit using HGH therapy because it might stigmatize them as too old to get work.

Have you ever wondered why some Hollywood actors seem to be ageless? The secret might be growth hormone. Although stars are notoriously secretive about their use of growth hormone, a few have admitted to using it. Sylvester Stallone and Nick Nolte have come forward to praise it. But what about female actresses? They are even more secretive than the men.

Actress Jane Seymour, who was voted the world's sexiest woman in her 50s by Zimbio (an online magazine), has said she used hormone replacement therapy to deal with menopause. She told the Daily Mail, "I decided to take it, but on my terms."

Gorgeous Kim Catrall, who played Samantha Jones in the Sex and the City TV series and movies, announced, "I am leading my way through the menopause maze with my vitamins, my

melatonin sleep patches, my bioidentical estrogen cream, progesterone cream, and a touch of testosterone." Maybe a touch of growth hormone too, given her flawless skin and figure at age 55+.

"Designing Women" star Dixie Carter, age 65, has openly admitted taking HGH. "I feel better," she told an interviewer. "My body seems firmer and in better shape. My complexion looks better, with hair that is thick and looks great... I believe this is all because of the hormones."

Alana Stewart, age 66, the ex-wife of Rod Stewart, said she uses it to get rid of her gray hairs to Vanity Fair magazine. Ms. Stewart was the only person who agreed to go on the record in the Vanity Fair report on HGH use in Hollywood.

The National Enquirer, a great source of gossip, published an article on February 1, 2005 that named a number of stars as HGH users. Among the female celebrities listed were Pam Anderson, Janet Jackson, Jessica Simpson, Madonna, Demi Moore, Jenny McCarthy, Marla Maples, Britney Spears, Jennifer Anniston, and Courtney Cox.

Playboy pinup twins, Shane and Sia Barbi, said "HGH has raised the bar on body perfection in Hollywood... a woman who goes quickly from ordinary to extraordinary – washboard abs, a lean figure with no fat around her hips, knees, or upper arms, well-defined, muscular legs, and a chiseled jaw with moist, firm and youthful looking skin – is guaranteed to be on HGH."

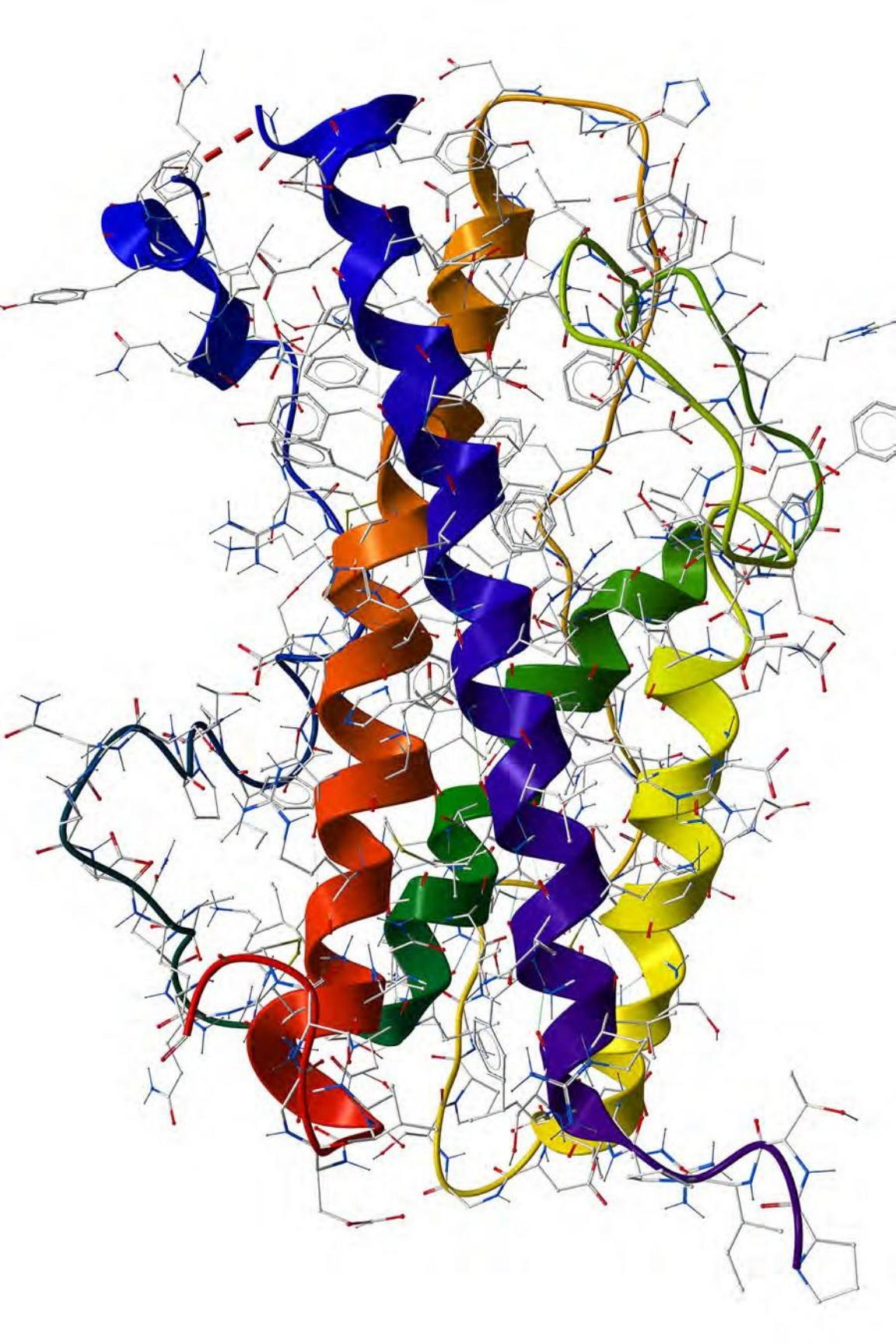
Erika Janes, a skin care specialist for many celebrities, recommends HGH to her clients, although she refuses to discuss who uses it. "Many of my clients take HGH. They are some of the most beautiful women in the world."

Celebrity image consultant DiCrisco said, "To me, Madonna's body looks like an advertisement for HGH use." Madonna's chiropractor, Dr. Michele Borsten, says on website, "The potential of HGH is to turn back the clock 10 or 20 years."

Rock icon Deborah Harry, age 66, is a fan of HGH. Photographers mistook her for Lindsey Lohan, age 25.

Reps for Jennifer Aniston, Demi Moore, and Pam Anderson say their clients don't use HGH.

Among male actors, you can probably assume that everyone in “Expendables” movies are avid fans of HGH. Men are just as secretive about their HGH use, hoping that audiences believe their great abs are due solely to good genetics and hard work at the gym.



SECTION 3

The Benefits of Growth Hormone

News about the benefits of HGH first began appearing in the media in 2008. By 2012, most people were aware stars were getting sculpted abs through the use of growth hormone.

CNN, Vanity Fair, the New York Post, the New York Times, the UK Mail are among dozens of media outlets that have reported on growth hormone used by actors such as Sylvester Stallone to fight age. At the same time, the news was (and is) filled with reports about illegal HGH use in professional sports, suggesting that HGH enhances performance and endurance. In fact, reports about HGH were widespread during the 2006 Olympics. So the media, more than medicine, has made Americans aware that growth hormone has obvious benefits for the people who use it.

Symptoms of Growth Hormone Deficiency

The symptomatology can be discussed under neuropsychiatric-cognitive, cardiac, metabolic, muscular, and bone symptoms, such as:

- Changes in memory, processing speed and attention
- Lack of well-being
- Depression
- Anxiety
- Social isolation
- Fatigue
- Lack of strength
- Central adiposity
- Decreased muscle mass
- Decreased bone density
- Impaired cardiac function
- Decreased insulin sensitivity
- Increased low-density lipoprotein
- Pro-thrombotic state
- Decreased sweating and thermoregulation

Source: Vishal Gupta, Dept. Of Endocrinology, Jaslok Hospital and Research Centre, Mumbai, India

Summary of Growth Hormone (HGH) Benefits

Growth hormone has been called "the fountain of youth" by those who swear by it. HGH has been around since the 1950s, but didn't get studied in adults until 1990, long after synthetic HGH became available. Growth hormone is a protein hormone produced by pituitary. Some of the benefits of HGH are direct and some occur indirectly through mediation with other hormones, like insulin growth factor (IGF-1). But overall, the benefits of HGH can be summed up as follows:

- HGH benefits the metabolism of fat and its conversion to energy, resulting in a leaner body and increased energy levels.
- HGH benefits new protein synthesis, resulting in increased muscle mass, improved tissue and skin repair, renewal of skin cells.
- HGH benefits sleep patterns by improving deep REM-sleep, resulting in improved brain functioning, decreased risk of obesity, and better mood.
- HGH benefits libido and sexual performance by interacting with hormones such as testosterone.
- HGH benefits the cardiovascular system, cholesterol profiles, and immune system.
- Synthetic growth hormone mimics human-produced HGH so closely, it has been extremely difficult to detect in sport doping. In clinical practice, this benefit of HGH translates into minimal side-effects and little to no interference with other important "feel and look good hormones," like testosterone (in men) and estrogen (in women).

THE BENEFITS OF GROWTH
HORMONE (HGH) IN MORE DETAIL

General Health Benefits of HGH

- Lowers Blood Pressure - Several studies have shown HGH therapy improves cardiovascular function and lung capacity, resulting in a reduction in diastolic blood pressure by about 10%.
- Lowers LDL Cholesterol - Dr. Daniel Rudman's landmark clinical study with 12 elderly men demonstrated a link between human growth hormone replacement therapy and improvements in cholesterol, including increased HDL (good cholesterol) and lowered LDL (bad cholesterol) levels. Dr. Rudman's study, which was published in one of the world's most highly respected medical journals, was the first to study growth hormone replacement therapy in adults, and it opened the door to an entire field devoted to HRT.
- Enhances The Action of Insulin - A study conducted at John Hopkins Institute demonstrated that HGH regulates glucose levels. HGH enhances the action of insulin and reduces the absorption of glucose by fat cells.
- Increases Bone Density - The loss of bone density found in osteoporosis makes bones lighter and more brittle, leading to increased risk of fractures. A prominent study in the Journal of Endocrinology and Metabolism found that out of 500 women in a three-year trial, those who received growth hormone therapy demonstrated less loss of bone mineral density than women who received a placebo. Other studies have found that HGH is also effective in treating bone less in

men. Confirming these results, bone loss occurred when growth hormone therapy was discontinued.

- Metabolic Benefits of HGH: Builds Muscle Mass. Severe muscle wasting (cachexia) is found in anorexics, cancer patients receiving chemotherapy, and AIDS patients. The body transforms carbohydrates into energy needed to survive, and when enough carbohydrates are not consumed and digested, the body begins to first burn fat reserves and, as fat reserves are emptied, burns muscle. HGH has been so successful in reversing the muscle wasting and loss of immune system functioning occurring with AIDS, human growth hormone is approved by the FDA for the on-label use in AIDS patients.
- Increases Lean Muscle Human growth hormone not only speeds the repair of tissue, it is androgenic. It improves the ratio of muscle to fat, with the result that the body becomes leaner and more sculpted. Burns Fat Human growth hormone speeds the metabolism and increases the rate at which the body uses fat for energy.

Increases Metabolism and Energy

Growth hormone affects protein, lipid and carbohydrate metabolism. Growth hormone therapy has both direct effects and indirect effects upon metabolism, with IGF1 playing the role of a mediator. Growth hormone stimulates protein anabolism, resulting increased protein synthesis and decreased protein oxidation (loss), which has a beneficial impact upon both the metabolism and the immune system. These benefits are in addition to the "fat burning" benefits of

HGH in the body.

Improves Sleep and Weight Loss

The connection between growth hormone, obesity and insomnia is well known. Obesity and insomnia often occur together, interrupting the production of growth hormone during nighttime REM sleep, which in turn creates a vicious cycle of greater obesity and insomnia. The use of growth hormone to assist with measures to reduce obesity also improves sleep, and help patients get on track to normal growth hormone levels and a healthy weight.

Sexual Benefits of HGH

Sexual performance and function are at their peak in puberty and decrease in vitality as we age. Human growth hormone levels and sexual libido and performance are correlated. HGH therapy has been shown to restore libido and even sexual performance, if vascular insufficiency is not the cause of the malfunction.

Anti-Aging Benefits of HGH

In a study conducted at Wisconsin Medical College between 1994 and 1996, more than one-third of the 300 study participants receiving growth hormone therapy had observable improvements in hair texture and color, including decreased graying, and many had regrowth of new hair as well

as halted hair loss.

Insulin growth factor 1 (IGF1), which is triggered by HGH, is known to be responsible for the development of vision and for playing a role in preventing retinopathy in infants. Clinical evidence related to these benefits in adults is limited, but there is anecdotal information suggesting that growth hormone is also important in adult eye health, and that growth hormone deficiencies are related to the development of cataracts, glaucoma, and loss of visual acuity.

Human growth hormone is the big player in the regeneration and repair of skin tissue and as the expediter of wound healing. Numerous studies have demonstrated the wound healing and tissue repair properties of HGH. Professional athletes and bodybuilders use HGH for many purposes, but one of the primary ones is that human growth hormone speeds recovery time, allowing the body to endure greater levels of punishment. The same effects of human growth hormone are seen cosmetically in the appearance of younger, more elastic skin. One of the first benefits of HGH noticed by older adults is smoother skin with better tone and reduced pigmentation (age spots).

When Most People See Results

Month 1: Improved wellbeing, stamina, sense of youthful energy. Month 2: Noticeable fat loss, leaner muscle mass, improved muscle definition.
Month 3: Improved mental outlook, memory, sharper mental acuity, Increased HDL (good cholesterol), improved cardiovascular functioning.

Month 4: Enhanced cellular regeneration, rejuvenation of aging tissues, Improved recovery time after exercise, greater physical stamina, Cardiovascular and circulatory system show improved test scores, Gastrointestinal system repairs, better digestion, Improved hair growth, texture and color Faster nail growth, greater nail strength.
Month 5: Improved corneal and retina health, possible improvement in vision, Repair of cartilage damage, increased cartilage growth, Decrease in symptoms of arthritis, pain on standing, greater mobility, Loss of abdominal fat ("belly fat"), conversion of fat into muscle, Return of libido and sexual function in men and women.
Month 6: Sense of "clock being turned back 20 years," Dramatic rise in IGF1 levels in deficient adults, Noticeable changes in skin and hair appearance, disappearance of wrinkles, Less bruising, faster healing, cell regeneration, HGH levels rise above 300, higher IGF1 levels, Full benefits of growth hormone are now evident and sustained.

If You Are On HGH and Are Not Seeing These Results

First and foremost, if you are on HGH, you should expect to feel better in a matter of weeks, not months. If you do not feel better, then you were either prescribed the wrong dosages or the wrong products. This is more common than you might think. In my practice, I have seen dozens of patients who went to Mexico, came back with scripts, and eight months later had very little to show for their efforts. They were not benefiting from HGH because they had not been put on the right HGH

replacement program. Within a matter of weeks we got them on track with a complete hormone replacement program – not just HGH, but testosterone and supplements – and their levels shot through the roof.

Many people don't realize that growth hormone is only one of about 80 powerful hormones in the human body. You can't fiddle with HGH, ignore related hormones, and expect optimum results from HGH therapy. HGH deficiency indicates you suffer from a general endocrine imbalance affecting other hormones as well. As a matter of fact, just about any chronic disease usually results in low HGH/IGF1 levels.

Factors such as your blood levels of insulin and cortisol have a huge impact on growth hormone production and secretion, and on the production of IGF1 by the liver. IGF1 is directly responsible for many of the same benefits of HGH, and insulin and HGH often work at cross purposes, so you can see why a script for growth hormone alone won't give you the same benefits as a bona fide hormone replacement program.

SECTION 4

How HGH Levels Are Tested

Growth hormone can be legally prescribed only to treat a growth hormone deficiency. This means your doctor must identify a clinical deficiency. This is accomplished only through a physical exam and blood tests.

Multiple tests are available and there is no "ideal test" for all patients. The growth hormone test use may vary depending on your age, obesity, and other factors. The quickest way to test for HGH deficiency is to measure the amount of IGF1 circulating in the blood. A value below 200 is generally considered to be deficient. The quickest way to increase HGH and IGF1 is through daily injections of HGH.

The following blood tests are used to help diagnose growth

hormone deficiency:

- GH blood serum test
- GH and IGF-1 blood serum test
- Arginine Only Test
- GNRH-Arginine stimulation test
- Insulin tolerance test (ITT)
- Tests to measure levels of other hormones made by the pituitary gland

GH Blood Serum Test

This test simply measures the amount of free (available) growth hormone circulating in the blood. It is not a reliable test because many commercial immunoassay test kits measure irrelevant growth hormone isotopes, giving a false normal result. Even the 24-hour GH secretion test, which measures samples throughout a 24-hour period, is unreliable for diagnosing growth hormone deficiency in adults. In adults over 40 years of age, the reliability was about 80% but for those over 60, reliability dropped to 36%. The reason has less to do with the test itself, as performed in a clinical situation, but with the fact that there aren't enough control subjects to create an idea of what normal is.

GH And IGF-1 Blood Serum Test

This is the most common blood test for adult growth hormone deficiency. It is actually two blood tests. The Serum GH test measures growth hormone, which is produced by the pituitary. The IGF-1 measures the insulin growth factor1, which is produced by the liver in response to growth hormone. Even if your pituitary is producing normal amounts of growth

hormone, you could be resistant to growth hormone or have a lack of growth hormone receptors.

There are a number of commercial kits available for testing serum GH and IGF-1. Some tests, in our opinion, are better than others. If a clinic sends you a "test yourself at home" kit, this is a bad idea for a number of reasons. First, there is a good chance of error when you draw your own blood, mix it in the tube with antibodies, and mail it back. More important, the clinic is ignoring other hormones, which could be causing more problems than any growth hormone deficiency.

Disadvantages of the GH and IGF-1 Test

The level of growth hormone (GH) and IGF-1 circulating in your blood will vary depending on the time of day. They will also vary depending on your stress level, whether you are obese or not, if you have just eaten or exercised, and of course, your age. For example, fasting (dieting) will reduce IGF-1 quickly and dramatically. If you are overweight, your growth hormone production will be less than other people. Since it is typical that overweight people diet intermittently, their growth hormone levels will be way off. This is one many reasons it is important to meet and be evaluated by a doctor – he will notice factors you may not think of that influence GH production.

There is currently no standard growth hormone/IGF-1 blood test. Newer tests make use of a highly sensitive chemiluminescent method of identifying GH, but there is a great amount of discrepancy between the results obtained by different labs, because they calibrate their equipment differently and adhere to different standards.

Arginine Test

This test is often used to assess GH secretion. However, it is not as reliable as when it is used in combination with a stimulator or precursor like GHRH. Sometimes it is combined with the secretagogues L-dopa and clonidine, but both of these are have a weak influence and the test results are not very reliable.

GHRH and Arginine Stimulation Test

Next to the insulin tolerance test and the glucagon stimulation test, this the most reliable test of growth hormone deficiency in adults. The amino acid arginine and growth-hormone releasing hormone (GHRH) are administered together to stimulate GH production. This test avoids the problems involved in varying levels throughout the day. Arginine (produced by the hypothalamus) blocks somatostatin hormones that interfere with growth hormone release. GHRH stimulates the pituitary to release growth hormone, and blood samples are taken every 15 to 30 minutes for 2 hours.

Disadvantages of the GHRH and Arginine Stimulation Test

Aside from the time involved in administering the test, the biggest problem is that no one agrees what exactly is the threshold for being deficient. The other disadvantage is the test will give a false normal result in people who have a damaged hypothalamus. These people do not produce arginine naturally, so they do not block somatostatins. In reality, their growth hormone levels would be much lower than the test results. Estrogen also affects stimulation tests, so women on birth control are in the estrogen phase of their menstrual cycle will have invalid results. For example, oral

estrogen reduces IGF-1 levels and results in high GH readings.

Glucagon Stimulation Test

This test is on par with the GHRH-arginine stimulation test for reliability. Glucagon is administered and blood GH levels are taken after 90 to 240 minutes. Glucagon stimulated GH release, but the mechanism is not well understood. The Glucagon Stimulation Test can often disagree with the results of a similar test, the insulin tolerance test (ITT).

Disadvantages of the Glucagon Stimulation Test

There is also no agreement on normal thresholds. The GST can cause nausea and vomiting in 20% of patients, with glucagon acting on the body for 3 to 4 hours.

Insulin Tolerance Test (ITT)

Hypoglycemia stimulates growth hormone and cortisol. Inducing hypoglycemia with insulin is the gold standard of growth hormone tests, but must be administered in a healthcare facility (sometimes a hospital). This test also measures secretion of adrenocorticotropic hormone (ACTH) by the pituitary along with glucose levels. So, not only does this test provide the most accurate benchmark of growth hormone levels, it is important for assessing ACTH production and for assessing possible adrenal problems.

Disadvantages of ITT Test

It is unpleasant to go into a hypoglycemic state and the test is difficult to administer, so it is not used in most people. In addition, it is difficult to push some people into hypoglycemia. It should not be used in people with heart disease, adrenal disease, or epilepsy – and it can trigger adrenal exhaustion. In

addition, the response to the insulin tolerance test (ITT) can vary, depending on whether an individual is hyperthyroid or not (has low thyroid hormones).

Other Important Pituitary Function Tests

The hypothalamus-pituitary-adrenal (HPA) axis refers to the interaction between the hypothalamus (produces growth hormone releasing hormone), pituitary (produces growth hormone and hormones that stimulate cortisol production) and the adrenals (produce cortisol). A complete test of pituitary function would include:

Measuring secretion of ACTH (adrenocorticotropic hormone), which triggers production of cortisol by the adrenal glands (this is accomplished by the insulin tolerance test)

Measuring secretion of LHRH (luteinizing-hormone-releasing hormone), also known as gonadotropin-releasing hormone, or GNRH which triggers the production of testosterone in men and estrogens/ estradiol for women. Measuring thyrotropin-releasing hormone (TRH) secretion, which triggers the release of thyroid hormone by the thyroid, is also useful.

SECTION 5

Using Growth Hormone

Prescribed, FDA-approved growth hormone is used as an injectable solution. This is the only real form of growth hormone and the only way to take HGH is by subcutaneous or intramuscular injection.

Prescription HGH is administered by injection. The FDA-approved injectable formulations are available as liquid preparations and as powder with a diluent for reconstitution, but both are fragile and require care with storage and use. Growth hormone is typically sold in vials of powdered, lyophilized (freeze-dried) HGH. The vials are sold with a liquid (bacteria-free water) which you then mix together and inject. A few people (mainly bodybuilders) use liquid vitamin B12 instead of water to reconstitute HGH.

Prescription HGH is commonly referred to as a "kit," and different kits come with different amounts of lyophilized HGH powder and bacteriostatic water. The package directions will indicate how much powder should be mixed with water to create the needed dose. Doses are usually prescribed in milligrams but are sold and used as injectable units.

Convenient, pre-filled pens are also available, which make growth hormone easier to measure and to inject.

Types of Prescription HGH

Using recombinant DNA technology, two forms of synthetic HGH have been created: somatropin and somatrem. Somatropin is identical to the endogenous pituitary-derived HGH, whereas somatrem has an extra amino acid. Both synthetic forms have identical biological actions and potencies as naturally produced HGH. Synthetic HGH is chemically indistinguishable from the naturally occurring hormone in blood and urine tests.

Adult Dosages of HGH

Adult dosages are from 0. 9 - 25 microgram/kilogram/day, dependent on the level of deficiency and the product. Frequent and long-term injection cycles are required, because the circulating half-life of HGH is short (20-30 minutes) while its influence upon other hormones and cells in the body (biological half-life) is between 9 and 17 hours. For most people, a daily dose of .5 IUs up to 3 IUs is needed to maintain the health benefits of growth hormone, including fat metabolism. A dose of 1.0 IUs per day is sufficient for most people. In contrast, bodybuilders use between 4 IUs and 8 IUs per day, which causes unwanted side effects.

Titrating To the Right Dose

Growth hormone use is titrated, meaning you start with a low dose and gradually increase it so that your body has time to

adjust. This titration schedule is commonly called "ramping" and it helps you avoid the minimal side effects of HGH, such as bloating and joint pain.

In order to reach 1.5 IUs per day, you might start at .5 IUs and increase it by .5 IUs per week. So, within a month, you should be at the required dosage. This schedule will vary depending on your age, general health status, and other consideration.

Sometimes we recommend that patients split their injections into 2X daily. If at any point you begin to feel some side effects, such as bloating and muscle or joint pain, drop your dose back by 25% for a couple of weeks and then resume your dose.

What If You Also Use Other Hormones?

The effects of growth hormone are enhanced by other hormones. DHEA, melatonin, and testosterone (men) or estrogens and progesterone (women) are sometimes used together with growth hormone.

- DHEA increases muscle mass and burns fat
- Melatonin improves sleep quality, and sleep is required for natural HGH production
- Testosterone builds muscle and is usually required by men in andropause
- Estrogen and progesterone are usually required by women in menopause
- Some people also require IGF1, insulin, and thyroid hormones (T3 or T4). IGF1 is produced by the liver in response to growth hormone; it provides most of the benefits of growth hormone
- Thyroid hormone (T3) has growth and metabolism benefits

of its own, increases IGF1 production, and is often required because growth hormone lowers thyroid hormone production (the thyroid hormone T4, which is converted into T3)

What Are Growth Hormone Cycles For Optimal Aging?

You can inject growth hormone continuously, but take a day or two off per week. This is the most common way to use GH when it is part of a lifestyle. You can take 5 days on/2 days off, or 6 days on/1 day off, depending on what works best for your body. Some people will inject HGH every other day as their cycle.

Another option is to use HGH daily for the first 2 or 3 months in order to get your IGF1 levels up quickly and to see the greatest fat- burning effects, and then drop back to a schedule of injecting 5 days a week.

How Long Do Growth Hormone Benefits Last?

The benefits of growth hormone appear gradually, usually over the course of 6 months. If you stop taking growth hormone, those benefits will fade gradually, usually over the same period of time it took to achieve them. If you maintain an on-and-off again schedule, you will retain these benefits. The same is true if you inject 4 or 5 times a week, without interruption. Many people have used HGH continuously for 15 years, including a number of doctors who are prominent in the anti- aging field.

How Is Growth Hormone Stored?

All growth hormone, except for a few brands, requires refrigeration. It cannot be made and stored in large quantities, so this limits availability and drives up the price. Shipping must be in refrigerated trucks and it must be also be refrigerated when stored at your pharmacy. In powdered form, before reconstituting it into an injectable solution, some growth hormone brands will keep up to a year. Chinese growth hormone usually has a shelf-life of about 1 month. When growth hormone is stored too long, it loses potency and becomes inert.

SECTION 6

What Are The Side Effects?

The most common side effects of growth hormone replacement are fluid retention and joint and muscle aches, usually experienced during the first weeks of treatment. Redness and swelling at the injection site can also occur in some patients.

Growth hormone is produced naturally by the pituitary. FDA-approved injectable growth hormone is virtually indistinguishable from natural growth hormone, which is one reason it has been widely abused by professional athletes. Side effects are rare and generally occur when taking very high doses of HGH over a prolonged period of time. Bodybuilders who inject three and four times the recommended dose of human growth hormone can experience side effects.

More Common Side Effects of Growth Hormone

- Soreness or redness where growth hormone is injected
- In the first days and weeks of treatment, some adults may have swelling of the hands and feet (edema) and joint pain. The body is getting used to the return of HGH, which gradually pumps up vital tissues.
- In a person is getting too much growth hormone, he or she will have muscle and joint pain and pain or numbness in the hands from carpal tunnel syndrome; the amount of growth hormone should be reduced

Less Common Side Effects of Growth Hormone

- HGH gut syndrome is seen in bodybuilders who take very high levels of growth hormone, usually in combination with insulin and IGF1
- Insulin resistance (hypoglycemia) leading to increase blood glucose can occur in some people
- Acromegaly, or abnormal bone growth, is sometimes seen, primarily in bodybuilders

Contraindications for HGH Therapy

- HGH has not been found to cause cancer, but it is contraindicated in people with active cancer. Low growth hormone can be an early sign of some cancers in the brain or pituitary
- HGH therapy should be undertaken with care in people with

severe or chronic breathing conditions

- HGH therapy may need to be adjusted in patients with diabetes or impaired glucose tolerance; blood sugar needs to be monitored regularly
- If you are taking insulin, steroids, or drugs for seizures, these may need to be adjusting during HGH therapy
- HGH should be used during pregnancy only when clearly needed
- HGH should not be used by people under 30 because growth plates may not have fused.

How to Manage Side Effects

The most common side effect of HGH is bloating and joint pain; these are minimized if a gradual ramp up method is followed. If these symptoms are severe, you should contact your doctor. Usually these symptoms are relieved by dropping back on the dose a bit and increasing HGH more gradually.

There are no peer reviewed, published studies to indicate that HGH leads to human cancers. In fact, there have been recent studies to suggest that HGH can lead to a decrease in cancer cell growth.

HGH may suppress the production of thyroid hormones. If you have an under-active thyroid (low thyroid), this may need to be treated prior to beginning an aggressive growth hormone therapy program. Most patients with severe hypothyroidism (under-active thyroid) take T3 in addition to growth hormone.

HGH may oppose the action of insulin, for a short time, and may increase blood glucose levels, which can lead to insulin

resistance or metabolic syndrome in some people. To offset this, alpha lipoic acid and chromium picolinate may be used along with medications to dispose of excess glucose and increase insulin sensitivity. In some people, additional insulin should be combined with HGH.

Ongoing Medical Supervision

Growth hormone demonstrates amazing results because it has a powerful influence in the body. Ongoing medical supervision is required by law and is a matter of common sense if you are using growth hormone as part of an overall wellness and hormone optimization program. At the beginning of HGH therapy, you may be tested every 4 to 8 weeks in order to determine if more growth hormone is needed or less; your IGF1 level should an increase within 8 weeks your blood cholesterol and bone density will be measured; these should show signs of improvement. Your blood sugar levels will be monitored to determine if you are showing signs of insulin resistance After 6 months of growth hormone therapy, you will be in a maintenance phase and will need less frequent monitoring; we generally see our long-term patients every 4 to 6 months.

We provide growth hormone replacement within the context of overall hormone management; medical supervision will also determine how your testosterone (men), estrogen and progesterone (women), and other hormone levels are responding to replacement therapy.

Side Effects and Bodybuilding

HRT therapy restores growth hormone (and other hormones) to their optimal levels. Growth hormone stimulates growth in muscles and skeletal tissues, increases the rate of fat loss, strengthens cartilage and tendons, and improves the body's ability to repair itself.

Growth hormone works so well, its use is common among competitive bodybuilders and performance junkies. Many experts believe the incredible muscle mass of world-class bodybuilders and weightlifters would not be possible without HGH.

The kind of muscle bulk seen in these guys could not occur without serious overdosing of 20-25 I.U. per day and extreme stacking with thyroid hormone, testosterone and other steroids, insulin, and diuretics.

Prescribing HGH for men in this way is illegal, and exposes the doctor to criminal prosecution, loss of license, fines, and jail time. Because stacking is costly and illegal, bodybuilders use shady clinics or black market HGH from online sources. Black market GH is rarely the real thing and is often tainted with toxic metals and other impurities.

Serious side effects of HGH use are almost always due to overdosing. Acromegaly is the most common side effect; this is the thickening of bones in the feet, hands, jaw, and forehead. GH overuse can also enlarge vital organs such as the heart and kidneys.

Bodybuilders are also subject to nerve, muscle, and joint pain accompanied by neuropathy, or numbing and tingling of the skin. More dangerously, the abuse of growth hormone can

trigger insulin- resistant diabetes and cause high cholesterol levels.

Typically, bodybuilders develop what known as HGH gut. In recent years, increasing numbers of bodybuilders at contests have shown the phenomenon of "protruding gut syndrome." Most experts believe it is due to a combination of GH and IGF-1 overdosing, with IGF-1 causing growth of the intestines in the abdomen.

HGH Therapy Is Not Steroid Abuse

Steroids are defined by their carbon atoms and include naturally occurring testosterone as well as the class of synthetic steroids known as Anabolic-androgenic steroids, which include synthetic testosterone. Anabolic androgenic steroids are used legally when prescribed by doctors to treat specific deficiencies. They are not legal when used without a prescription and when abused. Bodybuilders and GH, IGF-1, insulin and steroid abuse have one thing in common: the need to bulk up beyond normal ranges for competitive purposes.

SECTION 7

How Much Does HGH Cost?

We include all doctors' visits and lab tests in our 6- month "Total Care" program. This program includes the hormones most people need, excluding growth hormone for a reasonable price.

The cost of HGH injectable medications can run $600 to over $2,500 depending on the amount you use, the brands you use, and where you get it. Typically, a male patient in his 50s also spends about $1500 a month on the prescription cost of growth hormone. A female patient her 50s might spend around $1200.

Costs of a Good Program

You need a doctor's prescription, which involves seeing a doctor, being evaluated, and getting tested at least once every 4 or 5 months. The cost for this varies depending on the doctor, but can be anywhere from $500 to $1200 per visit,

including lab tests. A good program is going think about all needed hormones, not just HGH, as well as diet, supplements and lifestyle advice. The cost of the top programs runs from $1000-$2000 a month. We believe there are a few top programs in the U. S., and we are one of them.

Using a Cut-Rate Clinic

The minimum monthly cost of doctor-prescribed hormone replacement therapy at a cut-rate clinic is about $800, including the drug. It is legal, but that is about all it is. When you fill your prescription at the clinic, you may be given HCG, inert HGH, or Chinese counterfeits. There are plenty complaints about these clinics selling fake HGH, and most people don't realize they've been duped. They wind up thinking growth hormone doesn't work.

Comparing the Legal and Illegal Costs Of HGH

If you buy HGH illegally through online black market sources, you will spend around $300 to $500 a month. Along with legal risks, there is the risk of getting tainted HGH, inert HGH (not active), or some products claiming to be HGH, that are not HGH at all. If you are lucky, you will simply wind up wasting your money.

If you buy your HGH through a doctor in Mexico, Canada or other foreign countries, it is still illegal even though you have a "doctor's prescription." HGH must be prescribed by a U.S. doctor, and if you get caught you face the same legal ramifications as if you bought black market stuff online. That being said, one Mexican clinic is advertising its HGH services as follows:

A full panel blood test ($995) to be completed at your local lab and drugs to be ordered online from them at between $7. 50 and $15. 50 per I.U. Most people take around 14 I.U per week, so you might save $400 a month, but you'll be getting Chinese Jintropin.

Why Is Growth Hormone So Expensive?

There are 3 reasons why prescribed, FDA-approved growth hormone is so expensive:

- Growth hormone is difficult to make
- Growth hormone is difficult to ship and store
- Growth hormone is produced by a limited number of FDA-approved companies

Will Insurance Cover Growth Hormone?

Most insurance companies will not cover growth hormone treatments except for severe pediatric disorders. Insurance companies will sometimes cover the cost of growth hormone drugs for adults with an extreme deficiency.

This would be indicated by a peak GH response of less than 9m UL during an insulin tolerance test, or if you are already being treated for pituitary disorder. A case could be also be made if you have had damage to your pituitary gland (for example, you have undergone radiation to the pituitary), have short bowel syndrome, or have suffered head trauma.

Some former boxers and football players have been covered by insurance for growth hormone due to head trauma, but this must be documented by an MRI.

What If You Cannot Afford Growth Hormone?

Research has shown that GHRH and Sermorelin (GEREF) can be extremely effective in stimulating growth hormone and may actually benefit some people as much as growth hormone.

You can boost your natural GH production through proper sleep and by supporting your body with the right foods and vitamins. Some oral peptides will also work to a small extent to boost your body's own growth hormone production. However, this usually requires very large doses, and your results would rapidly dissipate.

Women who have achieved the correct balance of estrogen, progesterone, DHEA, and thyroid hormone report feeling better and more energetic than they have in years, without growth hormone.

In men, the picture is even simpler, because increased testosterone also increases growth hormone. Testosterone replacement therapy is relatively inexpensive.

SECTION 8

Buying Human Growth Hormone

There is no generic growth hormone, because the specific recombinant DNA technology used to produce is patented by the manufacturers. Patented drugs are almost always more expensive than generic brands.

Is There Generic Growth Hormone?

Growth hormone is manufactured using a process called recombinant DNA technology. The genetic code (amino acid sequence) for naturally produced human growth hormone is inserted into bacterial genomes, which then manufacture growth hormone, which is harvested out of the cultures and processed into a form that can be reconstituted later.

This process is extremely difficult and requires absolutely precise laboratory conditions. There are currently only a limited number of FDA-approved manufacturers of human

growth hormone, and these are the only brands your doctor can legally prescribed. A doctor cannot legally prescribe Jintropin, a commonly used black market product made in China.

Buying Growth Hormone Online

Scams involve fake HGH, inert HGH, dietary supplements falsely labeled as having HGH-like effects, off-branded and deceptively packaged HGH...much of it occurring online.

Internet Sales and Off-Branded HGH

Real human growth hormone (injectable pharmaceutical HGH) is expensive. So there are numerous HGH scams, many of them involving illegal HGH imported from China or Mexico that may not contain much if any HGH, or may even contain toxic materials.

Illegal growth hormone is profitable, so there are a variety of ways that black marketers try to beat the system.

Most of the time, they use the Internet. Some wellness clinics are in league with online websites that sell bogus HGH from China or elsewhere. The doctor agrees to write scripts in exchange for kickbacks from the website pharmacy.

Just about anything you buy from an online pharmacy is illegitimate. They have no way of getting HGH cheaper than your real pharmacy can. So if the price is cut-rate, it is because they are selling cut-rate goods.

Illegal Performance Hormones

HGH is often marketed with other performance enhancing drugs (e.g., anabolic steroids). Like other industries searching for the formula for online success, the illegal drug trade encompasses a variety of Web, brick-and-mortar, domestic and global configurations. Illicit drug deals over the Internet have proliferated because buyers do not have to meet their dealer in a dark alley, but can simply Google for a supplier.

Most companies that sell HGH online and request a credit card will not ship the "real thing" and you will be ripped off. Others are unsavory operations with little to no regard for patient safety. Internet drug traffickers will often host the website in Russia, have a mailing address in Mexico, and ship Chinese drugs from India.

Is There A Natural Form Of Growth Hormone?

Growth hormone cannot be synthesized from animal or plants, because the human body will only recognize growth hormone based on human DNA. In the 1950s until the 1980s, it was harvested from the pituitary glands of cadavers. It was extremely difficult to come by, but about 30,000 children with severely stunted growth were given human- derived growth hormone (somatotropin). In 1985, when several reports of a neurological disorder (Creutzfeldt-Jacob disease) similar to mad cow disease were linked to somatotropin, sales in the U.S. were halted. The same year, synthetic growth hormone (somatropin) was introduced to the market by Genetech. The cases of Creutzfeldt-Jacob disease were later found to be

caused by pathogen- tainted samples.

Pills, Sprays, And More

Ignore the sales pitches. The only way that HGH works is by injection, and even then you need to be sure you have the real thing.

A protein molecule as large as HGH cannot penetrate intact into membranes to any significant degree. Most would be wasted if it were used in a nasal spray or orally. Growth hormone is fragile and has a very short half-life. In cannot exist in an active state without being handled with care and properly refrigerated. It can lose potency very easily and rapidly. This is why so much of the HGH sold online or through unscrupulous clinics is so cheap. If it was ever real to begin with, it has become inert.

The cost of growth hormone and of hormones in general has fueled an entire industry of dietary supplements and homeopathic formulations. Each one has a different spin, and some do contain growth hormone, although it may be the bovine form, which cannot be used by the human body at all and is simply excreted.

Dietary Supplements

There is not one dietary supplement on the market that can come close to the effects of real growth hormone. Even though some of these formulations contain growth hormone in small amounts, the body cannot absorb GH molecules through the skin, tongue or digestive tract. It must be injected beneath the skin into fatty tissue or muscle.

There is an exception. Some oral peptides do help boost growth hormone production. They cannot achieve the effects of growth hormone injections, but they can be of benefit. If you would like to know what these are, please give contact my office.

We would like to print the list here, but formulations change constantly. We might not recommend a product today that we recommended 6 months ago.

Homeopathic Sprays, Patches, Topical, and Sublinguals

Not to knock naturopathy, but the growth hormone molecule is too big to pass through the dermis (skin) barrier or sublingually (under the tongue). The gastric juices of the stomach will destroy active growth hormone in less than 3 seconds.

Homeopathic Nanogram Products deserve special mention, because they have tricked so many people into believing they are getting the real thing. First of all, there is no such thing as a “Nanogram of growth hormone.” “Nanogram” is a term made up by marketing people.

HGH injections are measured in international units, and just 1

IU of growth hormone would be equivalent to 300, 000 nanograms. Even the most potent homeopathic nanogram contains less than 50,000 nanograms and you would have to use the whole bottle. Plus, the delivery system is all wrong because, as we said before, HGH cannot be absorbed under the tongue, orally, through the skin, etc.

Homeopathic formulations are viewed differently than supplements, but they are not in the drug category. If they contained enough HGH to be at all effective, they would be regulated as a drug by the FDA and you could not buy it. Further, the cost would be the same as HGH injections. It's just too difficult to make and too hard to ship to be cheap.

SECTION 9

Is HGH Legal?

More 250,000 older individuals were treated for anti-aging with HGH in 2004, and this number has more than quadrupled in recent years.

If you are under a doctor's care and are being prescribed legitimate HGH obtained from a registered pharmacy, it is the doctor's responsibility to stay within the law. Under these circumstances, the use of HGH is perfectly legal.

Human growth hormone is not controlled under the Controlled Substances Act (CSA). However, under the 1990 Anabolic Steroids Control Act, the sale and use of HGH is prohibited "for any use...other than the treatment of a disease or other recognized medical condition, where such use has been authorized by the Secretary of Health and Human Services...and pursuant to the order of a physician" and is a five-year felony. HGH is listed by the World Anti-Doping Agency and the International Olympic Committee as a performance enhancing drug barring athletes from using it.

HGH as an Anti-Aging Drug

Unlike most drugs approved by the Food and Drug Administration (FDA), GH can only be distributed for medical reasons specifically authorized by the U.S. Secretary of Health

and Human Services, and these do not include aging or age-related disorders. The on-label use of growth hormone includes deficiency-related syndromes causing short stature in children, muscle wasting associated with AIDS, and adult GH deficiency syndromes. Testing reveals that many adults are in fact GH-deficient.

Growth hormone (GH or HGH) is the most powerful way to turn back the clock known to science. Even though HGH is extremely effective as an anti-aging drug, it is illegal to prescribe it for this purpose.
Nonetheless, the success of HGH in treating the symptoms of aging has led to an explosion in its popularity.

In 2004, 74% of human GH (HGH) prescriptions were for adults aged 20 years and older, and 44% were for adults aged 40 to 59 years, suggesting that a large proportion of GH sales go beyond strict interpretations of FDA regulations.

Mainstream Medicine, Anti-Aging and Wellness

Most conventional physicians fail to understand the benefits of hormone replacement therapy. In a JAMA article (Oct. 26, 2005), S. Jay Olshansky, PhD, from the University of Illinois at Chicago School of Public Health, stated, “According to laws instituted by Congress more than 10 years ago, HGH can only be distributed for indications specifically authorized by the

Secretary of Health and Human Services, and aging and its related disorders are not among them."

A mainstream medicine believes that the anti-aging benefits of HGH are not substantiated, and so should not be prescribed to adults. This is contradicted by the large number of studies that show HGH is of great value in treating HGH deficiency, which often occurs as your age. The bottom line is: if medical tests reveal an HGH deficiency, you are a candidate for hormone replacement therapy. Most mainstream physicians miss signs of deficiency.

CHAPTER 2

Related Hormones

Human growth hormone has been called the "fountain of youth." When you are young, your body produces ample amounts to provide plenty of energy, stamina, sex drive, metabolic drive

As you age, natural production of growth hormones declines year by year. The result is an increase in body fat and decreased energy, libido, and cell rejuvenation. This is because when growth hormone declines, and the body produces less IGF1 – the hormone directly responsible for most of the benefits seen in growth hormone replacement therapy. In addition, low growth hormone is usually related to abnormal levels of important hormones, including testosterone and thyroid hormone.

SECTION 1

Testosterone and HGH

Low testosterone and low growth hormone share many of the same symptoms. Further, studies have shown that decreases in testosterone result in decreases in growth hormone, and vice versa.

The pituitary (a gland located at the base of the brain) not only produces growth hormone, it regulates the production of testosterone. Men who are deficient in growth hormone are often deficient in testosterone, and the reverse is also true. Low T is the common name for testosterone deficiency, also called male hypogonadism.

Testosterone

Testosterone has become big news recently, but I have been treating low T for decades. When testosterone is measured, the important number is not your total testosterone level, but the level of "free" or unbound testosterone that is bioavailable

for the individual cells of your body to use in building muscle mass and having energy. Most of your testosterone (about 98%) is bound and just a small amount is unbound and available. The amount of free testosterone is higher when you are young (around 5%) and low when you are ready retire (around 1%). Normal total testosterone levels range from a low of 350 ng/dl to 1,200 ng/dl. Half of all 40-year old men have 450 ng/dl or below. A special lab test or predictive calculation is needed to determine how much of this is unbound. Testosterone is highest in the morning and after exercise or stress, so these may throw your test results off. You know why you need testosterone: sex and sex drive. But it is also essential to health including red blood cell production and bone density. Age will cause your testosterone to drop, putting you at greater risk of stroke, heart disease, depression, insomnia, Alzheimer's, and prostate cancer in addition to erectile dysfunction. Men with low testosterone also tend to put on weight. One reason is that testosterone is converted into the androgen (masculinizing) DHT, which in turn helps build muscle. Testosterone not only fuels your sex drive, it fuels a woman's sex drive, which is why women frequently lose interest in sex with menopause.

How Low T and Low HGH Are Related

The pituitary secretes growth hormone, but it also regulates the rest of your hormones. The pituitary has been called the “master gland” because it controls the production of 5 hormones that directly affect how you feel:

The pituitary produces follicle-stimulating hormone (FSH), which controls sperm production by your testes. The pituitary

produces luteinizing hormone (LH), which controls testosterone production by your testes.

The pituitary produces thyrotropin, which controls the release of thyroid hormones by your thyroid.

The pituitary produces adrenocorticotropin, which controls the release of cortisol and other hormones by your adrenal glands.

The pituitary produces antidiuretic hormone (ADH), which controls the "water balance" in your tissues.

If your growth hormone is low, chances are your entire endocrine system is off and you will be plagued by low energy, weight gain, loss of sex drive, and decreased mental acuity related to 5 hormones in addition to growth hormone.

Why Is Testosterone Important?

- Only 9% of men over the age of 45 receive the correct diagnosis and treatment for low T symptoms when seen by their primary care physician. Testosterone is the male sex hormone responsible for the development of male characteristics and virility. It not only triggers puberty, it is responsible for the maintenance of muscle mass, libido (sex drive), competitiveness, and energy levels. When testosterone declines with age or for any other reason, the symptoms of low T are experienced, including:
- Erectile dysfunction (ED) and decreased sexual desire
- Depressed mood and loss of self-confidence
- Fatigue and loss of energy

- Decreased muscle mass and osteoporosis Loss of facial and body hair

How Is Low T Diagnosed?

The diagnosis of testosterone deficiency (low T) requires a simple blood test. Saliva and urine tests are not reliable indicators of low testosterone.

How Is Low T Treated?

There are a number of prescription treatments for low testosterone, including gels or sprays, such as Axiron, Androgel, and Fortesta. These are be tricky to apply and can be transferred to others with skin contact, causing unwanted effects in children and women. These are also a "one size" fist all kind of approach, and do not take into account that not all patients absorb them equally well. Prescriptions for testosterone therapy have tripled from 2001 to 2011. Among all men over 40, nearly 3% are on testosterone therapy.

Source: Dr. Jacques Baillargeon, University of Texas Medical Branch

By far, the fastest and most efficient way to boost testosterone is with once weekly testosterone injections.

How Are Low T And Low HGH Treated Together?

Research into the administration of growth hormone together with testosterone has shown impressive results. There are

dramatic improvements in body composition, metabolism, energy levels, mood, kidney and cardiovascular functioning, and mental acuity.

Testosterone can be more effective than growth hormone in restoring muscle mass, but growth hormone is a critical player in the metabolism of body fat.

Synergistic effects between testosterone and growth hormone result in an increase in muscle definition and an average decrease in body fat of 21%, versus just 12% for growth hormone alone. The beneficial effects of growth hormone on cholesterol also offset the tendency of testosterone to increase blood lipids and lower HDL (good cholesterol).

SECTION 2

Thyroid Hormone and HGH

Hypothyroidism (low thyroid levels) is so common among middle-aged women; perhaps it should be called "female low T."

By age 60, there is a 1 in 5 chance that a woman has a thyroid condition. Happily, is as treatable low testosterone (low T) is in men. The problem is that it goes undiagnosed and that conventional medicine frequently does not work.

Conventional endocrinology uses a thyroid stimulating test to identify low thyroid (TSH), but many doctors believe that over 90% of women with low thyroid have normal tests results using the classic TSH procedure. A far more accurate picture is provided by how you feel day-to-day.

Conventional synthetic thyroid medications such as Synthroid are not always effective, either. Traditional endocrinology believes that T-4 drugs like Synthroid are the only way to treat low thyroid, assuming that the body will convert T-4 into the

needed form of T-3. This is not always the case, and many women do better with bio identical combinations of T3 and T4, such as Armour.

Hormone Therapy and Weight Loss

The combined administration of GHRH and GHRP-6 represents the most powerful GH releasing stimulus known in obesity, but once again it is less effective in obese patients than in lean subjects. Simply put, what this means, is that if you are overweight, you will have less growth hormone to help you out. Growth hormone secretion increases when patients lose excess weight, but getting there is a struggle. This is why it is easier to lose 5 pounds if you are only slightly overweight, than the same 5 pounds if you are obese. And if you are overweight, growth hormone will have less of a beneficial effect on you.

Researchers at the University of Milan who studied growth hormone and obesity (1999) concluded that in spite of resistance to GH, treatment with biosynthetic GH has been shown to improve the body composition and the metabolic efficacy of lean body mass in obese patients.

SECTION 3

Cortisol and Adrenal Fatigue

Cortisol and growth hormone are both regulated by a circadian rhythm, which in turn is governed by the hippocampus. If the hippocampus is malfunctioning, both cortisol and growth hormone production will be out of whack.

Cortisol production is ultimately governed by the brain. The brain mediates stress, sending signals to the adrenal glands to release cortisol, which in turn release glucose to fuel your brain and body in response to the stressing agent. Adrenal fatigue usually occurs as the result of prolonged stress, with the result that the adrenal glands can no longer secrete cortisol.

However, adrenal fatigue can also occur when the adrenals are perfectly normal, but the brain is failing to send the proper signals. This means that some people can be suffering from adrenal fatigue (low cortisol production), without having gone

through the typical stages of adrenal exhaustion. Low cortisol has negative health impacts, including suppression of the immune system, spikes in insulin and blood sugar (hypoglycemia), inflammation, and cognitive dysfunction including memory loss. Elevated cortisol levels, on the other hand, suppress the pituitary (leading to low testosterone levels), suppress thyroid hormones (so you get fat), and increase blood glucose levels (related to diabetes).

Circadian Rhythms and Hormone Production

Normally, cortisol secretion is highest in the morning and lowest at night. Growth hormone secretion is the opposite, highest at night and lowest in the morning. Inverted circadian rhythms are used as an early biomarker for Alzheimer's. Often, the solution for adrenal fatigue is not a matter of adding hormones, but of restoring proper circadian rhythms. Alpha GPC and phopshytidylserience are useful in correcting an abnormal circadian rhythm. Melatonin can also help you achieve regular, nighttime sleep. You must follow a regular pattern of sleeping at night for 8-10 hours. If you work at night, this will need to be addressed by your doctor because circadian rhythms are based on 24- hour periods of light and darkness.

SECTION 4

Insulin-Like Growth Factor

Insulin-like growth factor (IGF1) is produced by the liver in response to growth hormone and is directly responsible for many of the benefits of growth hormone replacement.

Insulin-like growth factor, sometimes called somatomedin C, is a protein hormone similar to insulin. There are actually several insulin- like growth factors involved in growth and metabolism, but IGF1 has the most pronounced effect. IGF1 stimulates repair and rebuilding of cells.

- IGF1 builds lean muscle, bone density IGF1 improves protein synthesis and fat metabolism
- IGF1 regenerates nerve tissue IGF1 decreases LDL cholesterol

IGF1 Declines with Age

Like growth hormone, IGF1 declines as we age by 1-2% per year. By age 40 or 50, many people have low IGF1 levels (below 120 mcg/dl). Low IGF1 is a reliable indication of low growth hormone in most people.

Is IGF1 Available In Prescription Form?

Because IGF1 is directly responsible for the benefits of growth hormone, some people have wondered about using IGF1 instead of growth hormone to achieve the same results. IGF1 injected directly into the bloodstream will have a much stronger and more immediate effect than growth hormone. Increlex, produced by Ipsen, is the only drug currently available to treat IGF1 deficiency. Increlex is a recombinant DNA form of IGF1 but is not bioidentical. It is not a substitute for growth hormone and may have more severe side effects It is authorized only for use in cases where the body does not respond to growth hormone, and fails to produce IGF1.

IGF1, Growth Hormone and Insulin

IGF1 and growth hormone interact with insulin to control the metabolism. They function as a complex system with negative feedback loops. So, for example, too much growth hormone will trigger a reduction in growth hormone production. When there is too much growth hormone, it can also block insulin signals and cause a rise in blood sugar and insulin levels, which can sometimes lead to the pre- diabetic condition of insulin resistance. IGF1 will enhance insulin action and decrease growth hormone production, in effect countering insulin resistance. So IGF1 is necessary to counter any negative effects of growth hormone.

IGF1 and Cortisol

Cortisol is a glucocorticoid (GCs), a type of steroid, which not only helps you deal with stress, it can stop inflammation. Synthetic GCs such as prednisone, dexamethasone, and hydrocortisone are designed to stop inflammation, but are far stronger than naturally occurring cortisol.

Cortisol causes muscles to break down, whereas IGF1 builds them. IGF1 is also though to inhibit cortisol production.

SECTION 5

GHRH And Sermorelin

GHRH, sometimes called somatocrinin, is produced in the hypothalamus. It stimulates GH production by binding to GHRH receptors.

Insulin-like growth factor (IGF1), HGH and Sermorelin have been shown to have a potent effect on brain function, decreasing the likelihood of Alzheimer's and even improving cognition in adults.

Growth hormone releasing hormone (GHRH) triggers the release of growth hormone, which in turn triggers the release of IGF1, which is responsible for the beneficial effects of growth hormone replacement therapy. However, GHRH seems to have important benefits of its own, particularly in adults.

A 2012 study at the University Of Washington School Of Medicine found that GHRH, growth hormone, and IGF1 play a role in the development of Alzheimer's as levels of these hormones decline. The short-term administration (20 weeks)

of GHRH improved cognition in older adults and suggests that the same would be true in adults with mild cognitive impairment.

What Is GHRH And What Does It Do?

GHRH is produced by the hypothalamus in the brain, along with thyroid releasing hormone, cortisol releasing hormone, and luteinizing hormone (LH, sometimes GNRH). The role of GHRH is to stimulate the production of growth hormone by the pituitary.

The action of GHRH is opposed by somatostatin, which is also secreted by the hypothalamus. The on again, off again pulses of GHRH and somatostatin control the intermittent release of growth hormone.

Is GHRH Available In Prescription Form?

There is no bioidentical form of GHRH. Most drugs are currently in the research stages and cannot be obtained. However, some manufacturers have made drugs which contain shorter sequences of the 44 amino acids found in natural GHRH.

Sermorelin (Geref)

Geref, or sermorelin acetate, is made by Serono, which also produces prescription growth hormone. Considerably less expensive than growth hormone, sermorelin was introduced to the market in 1990 for use in children. It was withdrawn by the manufacturer recently, not for health or safety reasons, but in order to relaunch the product.

Sermorelin is the shortest functional fragment of GHRH. It is

sometimes called GRF-29 because it contains 29 amino acids out of the 44 found in natural GHRH. It has been widely used as a test for growth hormone production, but is now becoming used for its own sake in hormone replacement therapy.

The advantages of sermorelin are several. First, it triggers the body to produce its own growth hormone. Second, the cost is less. Third, it works well with testosterone. And finally, there is evidence that long term sermorelin therapy can be stopped and the benefits of high growth hormone levels will remain.

Other GHRH-Type Formulas

- Tesamorelin Acetate (Egrifta) – Discontinued
- CJC-1295 (ConjChem) -
  - CJC-1293
- GHRP-6
- Hexarelin
- HRF-129
- Somatoliberin
- Pralmorelin (GHRP-2)
- Nuvision Pharmacy has recalled its Sermorelin/GHRH and HCG formulations due to quality control issues and possible contamination

SECTION 6

Other Hormones and HGH

Hormone deficiencies are often seen in older men. Growth hormone production declines in the body at the rate of about 1% to 2% a year.

So, where the average 20-year old male produces about 500 micrograms of growth hormone, a 40-year old man will produce around 200 micrograms. By age 50, growth hormone has fallen by 80% to around 100 micrograms.

Luteinizing Hormone

Sometimes called lutropin, this hormone is produced by the pituitary gland and stimulates the production of testosterone. It works synergistically with FSH. It is similar in structure to TSH (thyroid stimulating hormone) and HCG (human chorionic gonadotropin). This hormone is needed for

reproduction because in men, it acts upon the Leydig cells of the testes, which produce testosterone, which in turn affects sperm production. It is controlled by the hypothalamus, which secretes gonadotropin-releasing hormone. In men, the normal range is 1.8 to 8.8.

Follicle Stimulating Hormone

Hormone testing for men usually includes FSH along with testosterone. FSH is produced in the pituitary gland and stimulates the testes to produce testosterone, androgen-binding proteins, and inhibin, a protein hormone which travels to back to the pituitary gland in a negative feedback loop to decrease FSH production. Usually, the ratio LH to FSH is 1:1, so while LH may not be measured, one can expect it to be about the same as FSH.

Androstenedione

This hormone is produced by both the adrenal glands and the testes, and is the precursor to testosterone. In males, a normal range is 1.89 ng/ml. Women produce it in adrenal glands and their ovaries and it is the precursor to estrogen.

DHEA

DHEA-S is produced in the adrenal glands, like cortisol. Not much is known about it, but it seems to have a masculinizing

effect. It is present in large amounts in the blood so while it is not a powerful androgen, it is an important one. Normal levels in men are 1. 0-4. 2 ug/ml. DHEA is also important for proper immune system function and cognition.

Sex Hormone Binding Globulin (SHBG)

This is produced by mainly the liver and is blood protein that binds most of the steroids, including testosterone, produced by a man's body. When androgen production increases, the available level of free SHBG falls. The other steroid hormones (progesterone, cortisol and are corticosteroids) are bound by transcortin, and adrostenedione is bound to albumin. SHBG inhibits the availability of free testosterone, and decreases with high levels of insulin, growth hormone, IGF1 (insulin-like growth factor), androgens, and transcortin. It is increased by high levels of estrogen and thyroxine (thyroid hormone T-4). It is associated with obesity and low thyroid. In adult males, the normal range is 20-60 nml/L. Starvation diets (very drastic, long-term low caloric intake) will increase SHBG and thus lower testosterone.
Insulin, on the other hand, will lower SHBG and increase free testosterone levels. If your pancreas (insulin) is not functioning and you are pre-diabetic, you probably have very little free testosterone.

Estrogens

Men need estrogen, just not in the same quantities that women do. High levels of estrogen in men accelerate the aging

process, but normal levels help reduce the risk of heart attacks and help you have a healthy thyroid. Alcoholism, obesity, and zinc deficiency all lead to decreases in estrogens.

Usually the level of the estrogen/estradiol is measured in men, because it is produced as an active metabolite of testosterone. In men, estradiol should be about 14-55 pg/ml. It is derived from cholesterol. An enzyme called aromatase "aromatizes" androstenedione into estrone, which is converted in estradiol. So, testosterone will in effect aromatize into estrogen, which is bound to the sex hormone-binding globulin (SHBG). If you do not have enough SHBG, you will have too much estrogen.

SECTION 7

HGH Secretagogues

Secretagogues do not contain human growth hormone. They are thought to trigger the pituitary into producing more growth hormone naturally.

A secretagogue is any substance that promotes the "secretion" of another substance. Studies indicate that some secretagogues are valuable in treating adult growth hormone deficiency (AGHD), particularly among older adults who are more sensitive to the possible side effects of growth hormone injections. Secretagogues are also called releasers, precursors, enhancers, stimulators, and prohormones. They are widely available in dietary supplements and are regulated by FDA food laws, but not under its drug laws. Growth hormone is simply a complex protein, or amino acid sequence, that acts upon cells in a specific way. Smaller amino acid peptides can interact with cells to stimulate GH production, and these are considered to be secretagogues.

Growth Hormone Releasing Hormone (GHRH)

The secretion of growth hormone by the pituitary is stimulated by the hypothalamus in the brain through the release of growth hormone releasing hormone (GHRH).

Aging results in decreased growth hormone production, but the pituitary retains its capacity to produce growth hormone. Stimulation with GHRH thus produces more growth hormone, with a resultant rise in IGF1, which is the hormone actually behind most of the benefits of growth hormone therapy.

GHRH administered once a day via injection has been show to stimulate GH and IGF1 levels. Older adults treated with GHRH showed levels of GH and IGF1 similar to those of young adults. IGF1 levels rose by 35% and not only did body fat decrease, older subjects taking GHRH showed less physical decline than the control group.

GHRH was also shown to improve fluid intelligence, or the ability to reason quickly and to think abstractly, which has been shown to decline with age. GHRH is available in both pill and powdered form and considered effective, although less effective than injected or intravenous infusions.

Ghrelin

Ghrelin is produced by the stomach and increases during fasting. It operates differently than GHRH, so that while it is very effective at stimulating GH production, patients given ghrelin often gain weight and do not lose body fat. This is partly due to the fact that ghrelin stimulates the appetite. The effects of ghrelin depend in part upon the presence of GHRH,

and GHRH depends in part upon the presence of ghrelin.

Supplementation is more effective if GHRH and ghrelin are used together, instead of either one alone. They also work better when combined with somatostatin blockers. Somatostatin, also known as growth hormone-inhibiting hormone (GHIH), prevents the release of growth hormone by the pituitary, and so will act against your efforts to stimulate growth hormone production.

GHS MK-677

The synthetic, non-peptide GHS MK-677 was developed as a mimic of ghrelin, which would bypass the somatostatin feedback, loops in the body. Like ghrelin, it stimulates the appetite and causes weight and fat gain. Unlike growth hormone, it also produced a decrease in LDL cholesterol. It is useful in people who want to gain some weight, but it does not have the fat-burning benefits of growth hormone.

Both GHRH and ghrelin differ from oral peptides in that they are true hormones.

Oral Amino Acid Peptides

Intravenous administration and the injection of amino acid secretagogues are well known to boost growth hormone production to a significant degree. Injected arginine, for example, is used to test the pituitary in the arginine stimulation test, a common tool for testing growth hormone levels.

There is also a widespread belief that amino acids in pill, powder and spray form can act as effective growth hormone secretagogues, These products are commonly used by athletes

as well as some anti-aging advocates. Studies have shown that these oral peptides (amino acids) do in fact increase growth hormone production, although to a much lesser degree than the injected form. Oral peptides are often sold in combination with vitamins such as B complex vitamins, herbs such as ginseng, and some minerals.

Arginine, ornithine, glutamine

Oral arginine, ornithine, glutamine, and lysine, L-arginine and L- ornithine have been shown by Duke Pearson and Sandy Shaw (pioneers of Life Extension) to cause the release of growth hormone when taken together. In some cases, ornithine has increased baseline growth hormone level up to four times. In high doses, ornithine can cause diarrhea in men, but not women.

There are conflicting reports in studies of oral arginine, and it appears to actually lower growth hormone during exercise, but raise it during slow wave sleep by approximately 60%.

Glutamine

Glutamine will release growth hormone when combined with intense exercise. Many amino acid secretagogues rely on a combination of arginine, ornithine, and glutamine to achieve growth hormone release through exercise and sleep cycles. They are often combined with lysine, because this amino acid reinforces the ability of the other amino acids to stimulate growth hormone release. Arginine pyroglutamate, for example, is a combination of arginine and glutamine bound together in one peptide. Arginine is also thought to work synergistically with lysine to stimulate growth hormone release, but some studies contradict its usefulness, particularly for older men.

The Need for Large Amounts

The amounts of amino acids needed to stimulate the release of amino acids are more than be placed into a few pills, so most HGH secretagogues do not contain the needed amount of amino acids.

The recommended daily dose of arginine is 2000-3000 mg per day (2-3 grams), which can cause nausea and interactions with NSAIDS.

The recommended daily dose of orthinine is 5000-10,000 mg per day (5-10 grams), which is the amount used in studies that showed it inhibited cortisone and stimulated muscle repair.

The recommended daily dose of glutamine is 1500-6000 mg per day (1.5-6 grams), which may interact with anti-seizure mediations and cause allergic relations in those who do not tolerate MSG.

These amino acids are usually combined with vitamin C and zinc, because both assist in tissue and collagen repair, and with bioflavonoids, because these assist with absorption of vitamin C.

Ornithine-alpha-ketoglutarate (OKG)

This is a combination of orthinine and alpha-keetoglutarate that is thought to encourage the release of both growth hormone and insulin. Since growth hormone inhibits insulin, this is a promising approach but few studies exist. OKG does seem to increase levels of arginine and glutamine, and oral glutamine has been linked to the release of growth hormone.

Glycine

Large doses of glycine, and especially of arginine and glycine together, seem to help subjects release growth hormone and also increased stamina and muscle gains in subjects who engaged in high-intensity and aerobic exercise.

Gamma-aminobutyric acid (GABA)

Oral GABA supplementation in doses of 5, 000 mg (5 grams) elevated growth hormone levels in 19 subjects compared to the placebo group.

L-Tryptophan

In 1989, Japanese-made L-tryptophan as linked to several fatalities and L-tryptophan was withdrawn from the market. In 1996, became available by prescription when the FDA concluded the fatalities were linked to impurities in the product and not L-tryptophan itself. It became legal as a nonprescription supplement in Canada in 2011. This amino acid supplement promotes sleep and is an effective antidepressant, because it raises serotonin levels. In order to use it to release GH, you would have to take 3,000-5,000 mg (3-5 grams). The best use of L-tryptophan is for its sleep-inducing properties, which aids in growth hormone production because GH is pulsed during nighttime sleep. L-tryptophan is now available once again as a dietary supplement in the U.S.

Levodopa (L-Dopa)

L-Dopa is related to the neurotransmitter dopamine that controls the brain's reward and pleasure centers. Deficiency results in Parkinson's disease. It has also been associated with stimulating the release of hypothalamic growth hormone-

releasing hormone when orally administered (o. 5 grams), and with a corresponding rise in growth hormone. L-dopa can have undesirable side effects, including involuntary movements, respiratory disturbances, and psychiatric problems. It is available by prescription, only.

How to Buy Secretagogues

There is a tremendous amount of misinformation on the Internet, including companies that sell ineffective products with grandiose but unsubstantiated claims. The quality of amino acids can vary greatly depending on the production methods, purity and manufacturing quality controls. Many products do not have sufficient amounts of amino acids, or contain them in the wrong ratios, or do not contain need supportive vitamins.

Amino acids can be produced using a variety of methods, including the fermentation method, enzymatic method, and extraction method. In the extraction method, amino acids are extracted from natural raw materials, but the yield is limited and the process is more costly. The fermentation method allows amino acids to be manufactured synthetically at low cost using microbial growth in glucose. The enzyme reaction method relies on the conversion of an amino acid precursor into a specific amino acid without microbial growth.

SECTION 8

How to Boost HGH Naturally

Numerous studies have shown that HGH replacement has many general health benefits as well as specific anti-aging effects. However, lifestyle also plays a role in determining how high your HGH levels are. Stress, diet, sleep, weight and exercise can influence growth hormone production almost as much as age.

Although injections of growth hormone are the most effective way to increase your growth hormone levels, there are some very effective ways to naturally boost HGH production and IGF1 levels. The best are:

8-10 Hours of Nighttime Sleep

Growth hormone is made in the body according to circadian rhythms based on daylight and darkness. You need at least 8 hours of uninterrupted sleep and this should occur at night to encourage natural HGH production. People who work nights have lower levels of growth hormone. So do women who are experiencing sleep disorders related to menopause? In order

to encourage nighttime sleep, you should avoid exposure to "blue light" at least two hours before bedtime. Blue light is a light frequency emitted by LED screens that throws off your circadian rhythms. You should also sleep in total darkness, because darkness is a governing force in your circadian rhythms.

Take L-tryptophan, now available again in the U. S., to promote sleep. It has also been shown to boost growth hormone levels. The L- tryptophan in warm milk is why this has been used for so many years to make children sleepy.

Take 1-5 mg of melatonin in sublingual form about 1 hour before bed. Melatonin plays an important part in regulating your body's syncing with light and dark, and has been associated with up to 150% increase in growth hormone.

Take 1-5 mg of glutamine before bed. Glutamine is an amino acid that is considered a secretagogue, or stimulant, of growth hormone productions. At high doses, it can interact with anti-seizure medications.

Vitamin D

Most Americans are deficient in vitamin D. Vitamin D is not only necessary for growth hormone production in both men and women, it is essential for testosterone production in men.

Your body can't get enough vitamin D from foods, but instead synthesizes it from exposure to sunlight to through the skin.

Most people do not have enough sun exposure, particularly during the winter. People with darker skin synthesize it less easily than people with pale skin. Glass blocks all UVB, so

sitting in a sunny window doesn't help. Supplements are an easy way to be sure you get enough of this vitamin. Vitamin D3 is the best kind of supplement to take.
Take between 300-1000 ng/L. It doesn't matter what time of day you take it.
The other option is to use a low-pressure tanning bed that produces a large amount of UVB light, rather than high intensity UVA light, but the amount of time you need to spend in one varies with your skin type, age, and general health.

Manage Not Avoid Stress

Any kind of stress, pleasant or unpleasant, causes the adrenal glands to release cortisol. Cortisol is associated with a decrease in growth hormone and IGF1, which contributes to accelerated aging.

In men, elevated cortisol causes a decrease in testosterone. In women, it is associated with decreases in estrogen and progesterone. High cortisol levels also decrease thyroid function. Because excess cortisol is associated with so many unwanted effects, there is a tendency to think cortisol is all bad. In fact, it is blamed to be the culprit behind all "belly fat."

However, cortisol is a key player in optimum health. Much of the bad press surrounding cortisol results from not understanding how it works. Cortisol can actually be one of the secrets to good health.
Cortisol is naturally highest in the morning. So is ghrelin, a hormone that helps release growth hormone but also stimulates appetite. When you eat carbs, blood glucose rises and your pancreas responds by producing insulin. By this

time, ghrelin will have kicked in to release growth hormone, which is generally considered to have an anti-insulin effect. At the same time, insulin will inhibit growth hormone production. Whew!

So what does this mean in practical terms?

Cortisol is intended to provide bursts of energy. Ghrelin stimulates hunger. As long as your body has available blood glucose, it will not burn muscle for energy. Your body is telling you two things: eat and be active. So, eat a light breakfast with fruit (fructose) and a piece of bread (simple carbs) to burn for fuel and go for your morning run. Cortisol inhibits insulin production in order to make blood glucose available for immediate use.

When you get back from your run, eat some protein with healthy fats for your body to use in building muscle. Protein will also supply the amino acids that help boost growth hormone. As growth hormone kicks in to tamp down insulin, the body is in storage mode – so you will build muscle, as long as you avoid sugars post-workout. In fact, sugars including fruit consumed after a workout can cause your hypothalamus to release somatostatin, which inhibits the release of growth hormone.

The real enemy is not cortisol, but a lifestyle that encourages chronically high levels of cortisol and insulin while starving the body of essential nutrients and aerobic activity, and discouraging growth hormone. This includes pumping your body up with caffeine and energy drinks, which push your adrenals to provide energy-releasing cortisol. If you need caffeine and sugar to survive, you may be already in a state of adrenal fatigue.

Lose Weight, Exercise and Take Secretagogues

Over the short term, exercise releases cortisol, which is the antithesis of growth hormone and testosterone. But over the long run, exercise increases both of these in men and women. This means increased energy and increased libido.

Secretagogues (amino acids that stimulate the release of growth hormone) can make it easier to begin the process of fat burning, muscle building, and the natural production of both growth hormone and IGF1. This is particularly true for menopausal women, who have a hormonal basis for finding it so difficult to lose weight and gain muscle tone compared to men of the same age. Worthwhile secretagogues include:

- Arginine (2000 mg daily)
- Orthinine (5000 mg daily)
- Glutamine (3000 mg daily)
- Combined with vitamin C, B complex vitamins, and zinc to assist in tissue repair

CHAPTER 3

HGH Therapy for Men

Functional hormone replacement therapy (Functional HRT) is a holistic approach to endocrine management in men.

My goal is complete wellness for every client, regardless of age. We treat human growth hormone deficiency in men as just one element in a much greater hormonal synergy that results in a richer, fuller and more optimized life.

SECTION 1

Men and Comprehensive HRT

Growth hormone works with other hormones to increase energy, libido, drive, muscle mass…all the desirable qualities of being male. Hormones are important in every cell in your body, and growth hormone has been called the "elixir of youth" for its powerful anti-aging effects.

Comprehensive Testosterone Therapy

Testosterone is a male sex hormone that is responsible for masculinizing features. It is the master hormone behind energy, virility, and sex. After the age of 30, testosterone drops by 10% every year, causing fatigue, loss of sexual functioning, and a general decline in wellbeing. Growth hormone drops at the same general rate. By age 50, men begin to enter male menopause (andropause) when low T and growth hormone deficiency become a prevalent problem.

Low T and growth hormone work together to create muscle

mass and a toned physique. The way this happens is that testosterone stimulates protein anabolism by reducing protein breakdown and oxidation in the presence of growth hormone. The most efficient way to replace testosterone is with testosterone injections in conjunction with treatment for other hormone deficiencies, including growth hormone and cortisol (adrenal fatigue) and nutraceuticals (pharmaceutical grade vitamin and mineral supplements).

Usually these nutraceuticals include zinc, vitamin D, and melatonin, because all three are necessary for growth hormone and testosterone production and decline as men age.

The benefits of testosterone therapy for men:

- Improves mood, self-confidence, and optimism
- Increases dominance, risk taking, and competitiveness
- Decreases body fat and increases muscle mass
- Increases libido (sexual drive) and improves erections
- Decreases risk of Alzheimer's and improved mental acuity
- Increases virility

Cortisol Therapy

Adrenal fatigue occurs when the adrenal glands are stressed to the point they can no longer produce cortisol. Cortisol is essential for life and supports variety cardiovascular, metabolic, and homeostatic functions. It is the most important of a class of steroid hormones called glucocorticoids (GC) that are synthesize in the adrenal cortex. Sleep, which encourages

HGH production, discourages the production of cortisol. Cortisol is produced by the adrenal glands and adrenal fatigue results when cortisol levels remain high for extended periods of time. Treatment of adrenal fatigue generally involves DHEA supplementation with pregnenolone. Adrenal insufficiency is often addressed before HGH replacement therapy is begun. Proper cortisol levels are essential because chronically high amounts of cortisol lead to premature aging and ultimately adrenal fatigue, a serious and debilitating condition.

Benefits of adrenal fatigue therapy for men:

- Increases energy and sense of wellbeing
- Normalizes blood sugar levels and metabolism
- Resistance to stress, allergic reactions
- Strengthens your immune system
- Relief of brain fog and improvement in mental acuity
- Improves tolerance for cold

Thyroid Hormone Therapy

Growth hormone and thyroid hormones interact in the hypothalamus, pituitary, and peripheral tissues. Thyroid hormone enhances the anabolic (muscle-building) and metabolic (fat burning) effects of HGH, and stimulates the production of growth hormone. Thyroid hormones act on every cell in the body, stimulating metabolic activities. It has clear growth-promoting benefits that intertwine with growth hormone. Symptoms of thyroid deficiency (hypothyroidism)

include: fatigue, hair loss, cold intolerance, and weight gain.

Benefits of thyroid hormone therapy for men:

- Improves metabolism and fat loss
- Control of cholesterol levels and reduced cardiovascular risk
- Improves mood and cognition
- Increases libido and energy

Insulin-Like Growth Factor (IGF1) Therapy

The presence of HGH stimulates the production of IGF-1 by the liver. IGF-1, which is also called somatomedin-C, is a naturally occurring protein that stimulates protein synthesis. It stimulates cell growth throughout the body and is responsible for the muscle mass increases and bone-density increases seen in growth hormone replacement therapy.

It acts on every cell in the body, including skin, encouraging cells to regenerate. IGF-1 is closely related to IGF-2, which binds to different cell receptors in the body. IGF-1 and growth hormone interact with insulin to regulate carbohydrate metabolism. An excess of HGH can block insulin signaling, resulting in increased elevations of glucose and insulin. IGF-1 can lower insulin and enhance insulin sensitivity. HGH has both - anabolic (insulin-like protein synthesis) and contra-insulin promotion of hypoglycemia and fat metabolism, effects due to the complex interplay between HGH, IGF-1, and insulin.

Insulin Therapy

Insulin is a natural protein hormone produced by the pancreas. Insulin governs the metabolism of glucose starches, fats, and proteins.
Combined with testosterone and HGH, it stimulates increased muscle mass.

Melatonin Therapy

Melatonin is the “sleep hormone” and is frequently recommended to counter the effect of jet lag. It is also helps regulated other hormones controlling the body’s circadian rhythms. Disruptions in melatonin have a boomerang effect, causing growth hormone levels to plummet. Being exposed to too much or too little light can disrupt normal melatonin cycles. Deficiencies in melatonin are usually accompanied by vitamin D deficiency because both are dependent upon light exposure. Vitamin D plays an important role in growth hormone secretion.

DHEA Therapy

DHEA (dehydroepiandrosterone) is a precursor to testosterone in men, so if you are deficient in DHEA you will most likely have low T. Low DHEA is also correlated to adrenal fatigue (cortisol hormone deficiency).

FSH Therapy

This hormone is useful for maintaining testicular volume when there is a large increase in testosterone levels, which have been known to shrink the gonads if improperly used.

LH Therapy

LH is a peptide hormone which produced by the anterior pituitary. It is important for maintaining normal levels of testosterone in men (and estrogen in women). In men, excess LG increases testosterone and has the same effects as anabolic steroids. Anabolic steroids as a group tend to be synthetic variations of testosterone such as Nandrolone.

SECTION 2

HGH Benefits for Men

In 1990, a study published in the New England Journal of Medicine showed growth hormone essentially reverses the signs of aging in men, results that have been upheld by hundreds of subsequent studies.

One of the earliest benefits of human growth hormone (HGH) therapy is fat loss – especially around the abdomen, where a lot of men develop the classic beer belly. Within weeks of starting HGH injections, men beginning shedding fat and replacing it with muscle.

In a controlled study at Thomas Hospital in London, 24 adults treated with HGH lost an average of 12.5 pounds of fat and replaced it with 12.1 pounds of lean body mass. Why is growth hormone important in men? Because growth hormone declines with aging. By age 40, growth hormone our growth hormone production is 40% of what we produced in our 20s, and by age 60, it is less than 25%.

The decline of growth hormone and the related hormone IGF1 are directly related to cardiovascular disease, reduced sexual function, decreased energy, and increased body fat, loss of

muscle and many other symptoms of aging. Men who have used HGH for years talk about similar benefits: they don't feel the aches and pains they used to, they sleep better, they have higher energy levels, and their sex lives have improved.

L*ow HGH Symptoms*

- Fatigue, decreased energy, feeling of not being able to keep up
- Unwanted fat, flabby muscles, weight gain
- Slow metabolism, can't eat what you used to
- Difficulty falling asleep, waking in night, restless sleep
- Lapses in memory, inability to multitask
- Feeling of having grown old, not what you used to be
- High cholesterol, arterial plaque, heart attack risk
- Loss interest in sex, erectile dysfunction

HGH Benefits

- Increased energy and motivation Increased lean muscle mass and bone density
- Normalized metabolism and decreased adipose fat

  Improved deep sleep, greater REM sleep, normal sleep patterns
- Improved memory, mental acuity and cognition
- Higher HDL (good cholesterol), decreased plaque
- Increased libido, improved sexual performance

How Does HRH Therapy Work?

HGH therapy involves the restoration of growth hormone levels. Recombinant DNA growth hormone (somatropin) is indistinguishable from naturally produced growth hormone (somatotropin). In fact, synthetic growth hormone has been abused by professional athletes precisely because it is so difficult to detect. Recombinant human growth hormone (somatropin) is a protein that is manufactured to be nearly identical to the main form of the naturally occurring human growth hormone. This hormone can stimulate tissue growth, linear growth (height), and protein, carbohydrate, lipid, and mineral metabolism. It has approved indications in both the adult and pediatric populations.

Source: FDA Drug Safety Information for Patients and Providers

SECTION 3

HGH and Andropause

The symptoms of low T are very similar to growth hormone deficiency. Testosterone works hand in hand with growth hormone to build muscle, increase energy and stamina, and maintain a normal, healthy sex drive.

By age 40, most men are experiencing a substantial decrease in both growth hormone and testosterone. To be truly effective, growth hormone replacement should be in balance with other hormones, especially testosterone. Many clinics fail to treat low testosterone in addition to low growth hormone.

Further, an imbalance or deficiency in one hormone has a domino effect, causing imbalances in other hormones such as cortisol and thyroid, creating the cumulative effect seen in aging.

By the time men enter their 50s and the beginnings of andropause, or male menopause, most men are suffering from a combination of hormone and nutrient deficiencies, ranging from low testosterone and growth hormone to minerals such as zinc. Many are suffering from adrenal fatigue, due to chronically high levels of cortisol (the stress hormone).

Thyroid functioning may also be impaired, leading to lethargy and metabolic weight gain. Deficiencies in the 3 primary hormones - growth hormone, testosterone, and thyroid hormones - are all associated with aging, decreased functioning, and loss of wellbeing. In order to restore optimal functioning, all of these hormones should be considered in hormone replacement therapy.

The sequencing of hormone replacement therapy is important. Adrenal fatigue, for example, is magnified by high levels of growth hormone.
For this reason, adrenal fatigue is often treated before HGH therapy is begun. Thyroid hormone functioning is generally restored at the same time as growth hormone, because growth hormone and thyroid hormone work together to enhance metabolic functioning.

Andropause and HGH

The symptoms of andropause (male menopause) include low energy, loss of libido (sex drive), erectile dysfunction, depression and irritability, muscle loss and loss of strength, decreased endurance, weight gain (particularly around the abdomen), difficulty sleeping and insomnia. These same symptoms are seen in middle-aged men with low growth hormone. Human growth hormone (HGH) is produced by the pituitary gland and declines with age. HGH is considered a "master hormone" because its presence regulates the secretion of other hormones, affecting all the cells in the body.

In a study of 333 patients with low growth hormone, these patients were twice as likely to die from heart disease as

patients in the control group.

-Dr. Bengt- Ake Bengtsson, 1996 Anti- Aging Conference in Las Vegas, Nevada Sleep, exercise, and certain other hormones and amino acids will increase the secretion of HGH. Stress will also cause a temporary spike in growth hormone production. Symptoms of low HGH include fatigue, low libido, weight gain (especially around the abdomen), joint and muscle pain, decreased mental acuity and memory, decreased strength and endurance, loss of muscle mass and bone density, skin aging (dryness and thinning, and increased risk of heart disease and strokes. HGH injection therapy is designed to boost IGF-1, which is responsible for many of the positive effects associated with growth hormone. HGH therapy will try to push IGF-1 levels to the upper ranges of normal.

Testosterone is produced by the Leydig cells in the testicles and is secreted in the blood stream, traveling to all cells in the body. Like many other important hormones, testosterone decreases as men age. Symptoms of low testosterone (low T) include a decrease in libido (sex drive), erectile dysfunction, memory loss, loss of muscle and bone density, weight gain, and depression. Testosterone replacement therapy requires the use of bioidentical hormones administered under medical supervision. While testosterone replacement products are available in gels and patches, the most effective treatment for low T is injectable testosterone.

Andropause and Low Cortisol

Cortisol (stress hormone) is produced by the adrenal glands, which sit on top of the kidneys. When cortisol levels rise in response to stress, men get a boost of energy, memory is improved, and motivation increases. However, when stress levels are prolonged, cortisol remains elevated, causing toxic effects. These include depression, memory loss, fatigue, stomach ulcers, weight gain and food cravings, bone density loss (osteoporosis), loss of immune function, high blood pressure and elevated cholesterol. Chronically high cortisol leads to the collapse of adrenal gland functioning, or "adrenal fatigue." The symptoms of this are manifest in poor glucose regulation and weight gain, rheumatoid arthritis, heart disease, insomnia, asthma and the onset of allergies, muscles aches and pains, depression, and stress intolerance. These symptoms are usually seen in older men who are experiencing andropause. The treatment for adrenal fatigue (low cortisol) is replacement therapy using bioidentical cortisol.

Andropause and DHEA

Dehydroepiandrosterone (DHEA) is s steroid hormone synthesized from cholesterol by the adrenal glands, which also regulate cortisol production. The amounts of DHEA produced by men decreases with age, and by age 70 men produce only 20% of the DHEA they had when they were in their 20s. DHEA is a precursor to the major sex hormones, including testosterone.

If the adrenals glands have pumped out too much cortisol, the

body can no longer produce adequate levels of DHEA. This is associated with extreme fatigue, inability to cope with stress, and depression. Low levels of DHEA make it impossible for the endocrine system to function, throwing off hormone balances, and creating a broad range of symptoms seen in andropause. Healthy levels of DHEA may help fight off Alzheimer's, osteoporosis, cancer, depression, heart disease, and obesity.

Andropause and Melatonin

Melatonin is a hormone produce by the pineal gland deep inside the brain. It is triggered by circadian rhythms (sunlight and darkness). Melatonin levels begin to rise in the evening and reach their peak around midnight, when HGH production is at its height. Melatonin is required for deep sleep and deficiency will interfere with the production of growth hormone. Melatonin may also help slow down aging in the body and the brain. It supports the immune system and provides a defense against autoimmune system malfunctioning and associated infections as well as cancer. Replacement improves sleep quality and provides powerful antioxidant properties.

SECTION 4

Adrenal Fatigue in Men

Adrenal fatigue has been popularized by late night infomercials touting adrenal support supplements. The problem is, while the symptoms are real, these pills do not work.

Symptoms of Adrenal Fatigue

- People with adrenal fatigue frequently prop themselves up with coffee, energy drinks, or caffeine colas, especially in the mid- afternoon.
- A craving for salt and sugar
- Tiredness, trouble falling asleep at night or waking up in the morning Needing stimulants like caffeine to get through the day
- Stomach pain, digestive difficulties, frequent heartburn or diarrhea
- Generalized malaise, low blood pressure, irritability
- Asthma and chronic allergies

What Causes Adrenal Fatigue?

Adrenal fatigue occurs when the adrenal glands (two small organs that sit above your kidneys) cease to produce the needed levels of glucocorticoids including cortisol.

Cortisol is the hormone, which provides the “fight or flee” response to stress. Chronic and prolonged stress is the most common cause of adrenal fatigue. Adrenal fatigue is seen in executives and professionals in positions of high competitiveness or responsibility, including C-Suite executives, attorneys, surgeons, entrepreneurs, stockbrokers, policemen and firefighters. Adrenal fatigue is also seen when the body experiences an extreme stressor such as severe infection or illness, surgery, and emotional stressors such as the sudden death of a loved one.

A frequently overlooked cause of adrenal fatigue is malnutrition resulting from the American Standard Diet (SAD), and hidden food allergies. The hypothalamus, a small gland in the brain, can release too little adrenocorticotropic hormone-releasing factor (CRF) in response to stress and the adrenals will produce too little cortisol.

How Is Adrenal Fatigue Related To Low HGH?

The pituitary, which produces growth hormone, also secretes ACTH, which stimulates the production of cortisol by the adrenal glands.
Growth hormone and cortisol are circadian, meaning they follow a 24- hour rhythm based on daylight and darkness.

Cortisol production is highest in the morning while growth hormone production is highest around midnight. When this rhythm is thrown off, too much cortisol and too little growth hormone may be produced. Often, this is due to a deficiency in melatonin, which helps regulate your circadian rhythms.

How Is Adrenal Fatigue Related To Low T?

Too much cortisol opposes the muscle-building effects of growth hormone and testosterone. Cortisol also lowers testosterone, allowing estrogen to take over. Research has shown that garlic not only lowers cortisol, it increases testosterone. Androsenedione is produced by both the adrenal glands and the testes, and is the precursor to testosterone. If the adrenals are in a state of collapse, too little adrosenedione will be produced and you will have low T.

DHEA-S is produced in the adrenal glands, like cortisol, and works with testosterone to create masculine characteristics. Any form of stress, including intense exercise or a tense business meeting, can raise cortisol levels. Insulin will reduce cortisol, so eating after exercise will help keep cortisol levels in check while also helping to avoid adrenal burnout. Eating 5-6 small meals a day keep insulin levels and cortisol levels steady, and the antioxidants found in vitamin C, vitamin E, and foods such as blueberries offset cortisol and its oxidizing (aging) effects on the body.

How Is Adrenal Fatigue Diagnosed?

Adrenal fatigue does not cause obvious signs of illness.

Instead, it manifests as continual exhaustion, a feeling of being run down, susceptibility to stress, and a weakened immune system. Adrenal fatigue is a highly individualized disorder.

Your symptoms may be quite different from another man of your same age and general state of health. No single blood or saliva test can pinpoint subclinical deficiencies in the adrenals. Diagnosis occurs through a combination of tests of overall endocrine function, evaluation of your medical history, and a physical exam. Although it affects millions of men in the U.S., adrenal fatigue is under-diagnosed because is not yet recognized as a distinct syndrome by mainstream medicine. A related condition, adrenal insufficiency, can cause kidney failure, adrenal crisis (shock), and ultimately death.

How Is Adrenal Fatigue Treated?

Once adrenal fatigue is diagnosed, treatment with a program of bioidentical hormone therapy, nutrition and nutraceuticals, and lifestyle changes yields successful results in a short period of time. Almost always, adrenal fatigue is correlated with other hormone deficiencies, including low T and growth hormone. This is why we prefer to run a complete chemistry panel and evaluation to develop a comprehensive and individualized program of hormone replacement. As the name suggests, the paramount symptom of this syndrome is fatigue that is not relieved by sleep. This fatigue has a distinctive pattern that sets it apart from fatigue caused by other health syndromes or lifestyle factors. Its pattern primarily reflects the depressed daily fluctuations of cortisol that result from the

reduced capacity of the adrenal glands to produce adrenal hormones. In adrenal fatigue, cortisol, which is normally highest at around 8 AM, is low in the morning and people have a hard time waking or getting up. Without stimulants, they generally do not really feel awake until after 10 AM and experience another low from mid to late afternoon. After 6 PM, their energy may rally and last until around 9 PM. If they stay up, they may get a second wind from around 11 PM to 1 AM. However, with each increment of reduction in adrenal function, they become increasingly fatigued and every organ and system in the body is more profoundly affected.

This article was written by James L. Wilson, MD, a founding father of the Ontario College of Naturopathic Medicine, one of the largest naturopathic colleges in the world. He is a pioneer in the area of stress and adrenal function and the author of "Adrenal Fatigue: The 21st Century Stress Syndrome"

SECTION 5

Men: Is HGH Right For You?

The doctors at HGH Therapy are the world's leading experts in growth hormone, testosterone, and adrenal fatigue therapy, with a more than a decade as the pioneers in male hormone management.

If you are over the age of 40 and have four or more symptoms of low HGH, you are a strong candidate for growth hormone replacement therapy. This can be confirmed by testing your blood serum levels of growth hormone and IGF1, a hormone associated with growth hormone.

Growth hormone has very specific benefits in men. It works with testosterone to provide energy, build muscle, and maintain a normal sex drive. It works with thyroid hormones to burn fat and maintains metabolic energy. Both growth hormone and thyroid hormones tend to be low in men with a BMI (ratio of fat to muscle) above 29%. It offset the effects of

cortisol, the “stress hormone,” by working in conjunction with insulin, ghrelin, leptin, and cholecystokinin (CCK) to regulate appetite and metabolism. It also works in combination with melatonin to normalize sleep patterns.

Growth hormone also has unique benefits related to the body’s ability to repair itself. For example, it promotes hair cell regeneration, which is why patients report new hair growth and thicker hair after several months of growth hormone therapy.

The much-publicized anti-aging benefits of growth hormone therapy are due to its ability to stimulate cell regeneration. Growth hormone deficiency is directly correlated to increased cellular oxidation, which is one of the mechanisms of aging. It has a regenerative effect upon skin and tissue cells, which is why patients have better healing and recovery after exercise and show a reversal of skin aging. Some patients report improved vision.

Growth hormone also lowers cholesterol, reduces the risk of heart attack and stroke, increases bone density, and improves the immune system. Growth hormone has been shown to have antioxidant effects, and it has been show to extend life span in lab animals, but increased longevity has not been studied in humans.

What Does Growth Hormone Not Do?

Growth hormone will not increase height in adults over the age of 30. Growth hormone has never been demonstrated to cause cancer in humans. Growth hormone does not cause

diabetes, but it can cause insulin resistance if doses are too high. Growth hormone does not cause growth abnormalities, such as acromegaly, except at the extreme and prolonged doses seen in competitive bodybuilding.

How Do You Start Growth Hormone Therapy?

The first step is to determine if you have a growth hormone deficiency. This is done with a blood test that measures growth hormone and IGF1 levels. If these come back within normal range, it does not rule out your candidacy for growth hormone therapy. Growth hormone deficiency can be difficult to determine in some individuals. Additional tests, such as the insulin tolerance test (ITT) may be required. These tests are not usually done at first because they can have unpleasant side effects.

The cost of the GH/IGF1 test is minimal. We usually recommend a complete blood panel, because low growth hormone is generally accompanied by other deficiencies, including low testosterone, which impact male endocrine balance and wellness. A patient care specialist gives you these costs based on your age and quality of life scores.

CHAPTER 4

HGH Therapy for Women

Growth hormone levels typically begin to decline in women during their early 20s. It is often equated with the energy, lean bodies, heightened sexual interest, and vibrant skin of youth – which is why it has become de rigueur among Hollywood actors.

Hormone therapy, particularly growth hormone therapy, has been shown to slow and even reserve the signs of aging.

Growth hormone is especially valuable because it increases cell regeneration, which fights the effects of oxidation. When growth hormone levels decline, the body loses its ability to repair itself.

SECTION 1

Women and Comprehensive HRT

Women produce hormones, including as estrogen, progesterone, follicle stimulating hormone (FSH), luteinizing hormone (LH) and DHEA, at various levels during menstrual cycles, pregnancy, and menopause.

Some hormones, such as GH, cortisol, and thyroid hormone, follow a circadian rhythm and will vary depending on the time of day. Normal hormone levels are determined by medical authorities to diagnose severe hormone disease and do not reflect optimal levels required by an individual woman.

HGH is released in pulses and a higher level is seen during a pulse. Normal values can vary widely, but in women a minimum level is typically 1-16 ng/ML.

Estradiol

Estradiol is the predominant form of estrogen produced in the ovaries. During the menstrual cycle, estradiol rises to 200-300 pg/ml per mature follicle and remains high if a woman becomes pregnant.
Estradiol levels decrease in menopause to less than 32 pg/ml, often dropping to less than 10 pg/ml., which has a tendency to also decrease the production of IGF1.

Progesterone

Progesterone is produced mainly by the corpus luteum, the remnant of the follicle that contained the egg released from the ovary.
Progesterone levels are less than ng/ml before ovulation and rise to more than 15 ng/ml after ovulation. Progesterone continues to rise if pregnancy occurs to 300 ng/ml or higher, but if there is no pregnancy, levels drop back to 1.5 ng/ml or less.

Thyroid Hormone

The American Association of Clinical Endocrinologist revised the normal levels for thyroid level in 2002, encouraging doctors to consider thyroid treatment for test outside the new reference range of 0. 3-3. 0. The new reference range doubles the number of people considered at risk of thyroid disease.

DHEA

DHEA (dehydroepiandrosterone) is considered a male sex hormone, however, like testosterone, it is also found in women. It is produced mainly in the adrenal glands and in women it is converted to estrogen, but in men it is converted to the male sex hormone androstenedione.

DHEA is produced from pregnenolone, the "mother" of all steroid hormones. Although men produce more DHEA than women, DHEA has a powerful benefit for women. Along with growth hormone, DHEA can reverse the signs of aging and is the best "feel good" hormone available.

When DHEA levels are low, you feel tired, out of sorts, lethargic, depressed, and have aching joints, lowered immunity, and loss of libido. There is growing scientific research that shows DHEA can help prevent Alzheimer's, cancer, osteoporosis, obesity, and depression. DHEA is a pro-hormone that decreases by 2% per year. An optimal range for a woman age 20-29 is 65-380 ug/dl. By age 40, DHEA has typically dropped to 17-110 ng/dl.

Cortisol

Adrenal fatigue (also known as "adrenal burnout" or "adrenal exhaustion") occurs when the adrenal produce too much or too little stress hormones, mainly cortisol and adrenaline.

Most women are stressed around the clock, causing dangerously high cortisol levels for extended periods of time. This slows down normal cell regeneration (a contributor to aging), impairs metabolism (leading to weight gain), and

weakens your immune system. When the adrenal glands are "exhausted" and can no longer respond to stress, the classic symptoms of adrenal fatigue set in.

A key symptom of adrenal fatigue in women is weight gain around the abdomen, sometimes called "belly fat." The adrenals also synthesize cholesterol into DHEA, needed for sex hormone production.
Disruptions in adrenal functioning will also cause disruptions in DHEA and in turn, will throw your estrogens (estradiol, estrone, and estriol) off balance.

Measurement of cortisol level will be inflated if you are taking estrogen, birth control pills, or synthetic glucocorticoids such as prednisone. Normal levels in the morning are 8-23 mcg/dl. Highest levels are in the morning (6-8 AM) and lowest levels are around midnight. Stress and illness will increase cortisol under normal circumstances.

Insulin

Under-active thyroid (hypothyroidism) is undiagnosed in the majority of women who suffer from it. It has the same symptoms as menopause (extreme fatigue, weight gain, depression, and loss of sex drive) and the signs of aging (hair loss, dry and thinning skin, sluggish metabolism).

In women, the thyroid and reproductive systems overlap. In an optimum state, the brain produces hormones (TRH and TSH) that stimulate the thyroid gland to produce active hormones (T3 and T4), which maintain your metabolism, mood, and "female" endocrine system. When thyroid

hormones drop, women experience myriad systems, from weight gain to fatigue Insulin is made by the pancreas and enables the body to use glucose for energy. Insulin resistance occurs when the body produces insulin but cannot use it effectively, causing a buildup of glucose in the blood. Insulin resistance is a precursor to diabetes and other serious conditions, but may have no symptoms. Being overweight and having a high BMI (body fat ratio) are correlated to insulin resistance.

The average fasting level in women is 8.4 uiU/nL. However, in people who eat a healthy Paleolithic-type diet, average fasting level is closer to 2.9 uIU/ml indicating that higher insulin level reference ranges are tied to the deficiencies in the typical American diet.

Melatonin

Melatonin is a hormone secreted by the pineal gland in the brand. It maintains the body's circadian rhythm (internal 24-hour clock), which governs the release of other hormones such as growth hormone and female hormones.

Melatonin is a common sleep supplement. Melatonin promotes deep REM sleep and is useful in dealing with the sleep disorders of menopause.

The level of melatonin in the blood triggers the release of cortisol by the adrenal glands, regulates the timing and release of estrogens, and affects the production of growth hormone. It is believed that melatonin is a strong antioxidant that can protect cells from free radicals, which are linked to aging. Free

radicals damage cells and play a role in heart disease and cancer. A study published in 2007 in the Journal of Pineal Research showed that exposure to low-level incandescent lighting for only 39 minutes can suppress melatonin by up to 50%.

Melatonin is beneficial for assisting in the production of growth hormone and in fighting Alzheimer's, but high levels in women can lead to infertility. Low levels of melatonin are also associated with breast cancer and diabetes. Supplementation for sleep varies from 1 to 3 mg taken 1 hour before bedtime, but this may vary.

Follicle Stimulating Hormone (FSH)

FSH is produced in the ovaries and stimulates egg maturation, indicating a woman's ability to become pregnant. Levels of FSH early in the menstrual cycle should be less than 9 mIU/ml for likelihood of pregnancy. A higher level of FSH indicates perimenopause and a level of 40 mIU/ml or higher indicates menopause.

On Hormone Replacement

Oprah invited Suzanne Somers on her show in 2009 to talk about bioidentical hormone replacement, growth hormone, and other ways women can take control of their health, and later invited Dr. Uzzi Reiss, a specialist in bioidentical hormone replacement. Oprah says, referencing menopause and hormone replacement therapy for women, "This is about

your hormones being out of whack, and you don't even know, we haven't had a language to talk about it. If you're a woman who's planning to live past the age of 35, at some point you is going to face hormone imbalance."

Oprah, who believes hormone replacement therapy is relevant to women of all ages, has published extensive information in O, the Oprah Magazine and on her website www.oprah.com. See what women are saying about menopause, aging, and hormone replacement therapy with synthetic vs. bioidentical hormones on her site, and judge for yourself. Since the largely discredited trials of 2003, the use of synthetic hormones has declined due to fear of increased breast cancer, heart disease, and stroke. Despite such fear, a plethora of studies have revealed that many bioidentical hormones can protect against cancer.

(Dr. Neal Rouzier Worldlink Medical, A Physicians' Training Program In Hormone Management and Replacement Therapy)

SECTION 2

HGH Benefits for Women

Many hormones decrease with age, but the one with the greatest impact upon the signs of aging is human growth hormone. Aging results from a combination of factors, but the dominant factors are (1) a decrease is hormone levels, and (2) oxidation at the cellular level, which causes DNA damage.

The Benefits of HGH Therapy for Women:

- Reverses age-related changes in the skin and hair thinning
- Improves sleep patterns and mood
- Reduces fat accumulation and increases metabolism
- Builds bone density and reduces osteoporosis
- Reinforces the immune system
- Increases energy and daily stamina

What Is Growth Hormone?

HGH is a protein hormones produced by the pituitary gland. Hormones are “messengers” that stimulate specific cellular activity. Growth hormone stimulates growth, repair, and maintenance of the cells in tissues and organs, including the brain. It regulates growth of muscle and bone, the metabolism of fat and sugar, and has a strong influence over cardiovascular health and brain functioning. Human growth hormone is produced in cycles, with the most being following nighttime REM sleep.

In the body, it speeds “fat burning” and controls the use of protein and fat for energy. Growth hormone gives the body the ability to use stored fat for energy instead of glucose. This can provide long-term increases in energy. Growth hormone is secreted by the pituitary in response to two hormones produced by the hypothalamus in the brain: growth hormone-releasing hormone (GHRH or somatocrinin) and growth hormone-inhibiting hormone (GHIH or somatostatin).

How Does GH Therapy Work?

Growth hormone production by the body declines with age. HGH therapy involves the restoration of growth hormone levels through the administration of bioidentical human growth hormone via injection. Injectable growth hormone is the most effective way to create and control the benefits of growth hormone.

Growth hormone deficiency should never be treated without taking other hormones into consideration. Every hormone plays a role in your endocrine system and excesses or deficiencies in a single hormone can through your entire system off balance. This is especially true in women who are either beginning to, or have already entered, menopause. The broad range of hormones – growth hormone, estrogens and progesterone, thyroid, cortisol, DHEA – must be at their optimal levels and in balance with each other for you to obtain the maximum benefits of growth hormone therapy.

How Many Women Use Growth Hormone?

Until relatively recently, growth hormone was used mainly by men. The public perception was that growth hormone was a "muscle- builder." This perception began to change in 2006, with the publication of Suzanne Somers' book, "Ageless: The Naked Truth About Bioidentical Hormones," in which she described her use of growth hormone to fight menopause and age. In 2009, Somers appeared on the Oprah Show, where she talked about growth hormone as one of her secrets to staying young. Although the show unleashed a firestorm of criticism from the mainstream medical establishment, the cat was out of the bag. Later guests on the Oprah Show included Dr. Uzzi Reiss, an anti-aging doctor to Hollywood celebrities who has written extensively on the benefits of HGH for women, including his book "The Natural Superwoman." Despite tremendous interest from women of all ages, the medical establishment has been slow to study the benefits of HGH therapy in women.

Most studies have been mixed or consisted only of men. Typically, if a woman goes to her primary care physician, she will be told her levels are normal, even if they fall at the very lowest end of the spectrum. So many women have not sought growth hormone therapy. Those who have tried it, say they want to stay on it forever.

Dawn Foley, age 43, says hormones had a dramatic effect on her. She credits growth hormone in particular with burning 10 pounds of belly fat she'd begun referring to as her pooch and restoring muscles she thought were gone forever. She claims the sun damage and fine lines on her face started to fade. She slept better and had more energy.

-Source: Self Magazine, August 2009

SECTION 3

HGH and Menopause

Women produce more growth hormone than men, but growth hormone production is linked to estrogen levels. If a woman has low estrogen levels, she will also have low growth hormone. This typically occurs when women are in menopause, so growth hormone replacement therapy should include bioidentical hormone replacement of estrogen and progesterone.

Most women begin to experience the signs of approaching menopause in their 40s, but it can start in a woman's 30s or even earlier. Perimenopause, which means "around menopause," occurs when the level of estrogen begins to rise and fall unevenly. Menstrual cycles may lengthen or shorten and menstrual cycles may occur without the release of an egg (ovulation). Some women also experience menopause-like symptoms, including mood swings, decreased libido, vaginal dryness, urine leakage, difficulty sleeping, weight gain, and of course hot flashes. These symptoms typically last around 4 years but can last just a few months or as long as 10 years, Menopause is unpredictable and women never know what to

expect, usually guessing their perimenopause will last as long as their mother's did. After 12 consecutive months without a menstrual period, perimenopause is over, and a woman is said to have entered menopause.

Blood tests cannot accurately evaluate hormones during perimenopause, due to erratic fluctuations of hormones. But women know the unpleasant and sometimes debilitating symptoms when they occur. Some women find short-term relief through birth control pills, but over the long run hormone replacement therapy is the preferred course of action.

Traditionally, a combination of estrogen-progestin has been used, with products such as: Premphase, Prempro, Activella in pill form Combipatch (patch) Provera, Prometrium, Micronor, Nor-QD, and Aygesti (oral progestin pills used with separate estrogen).

Estrogen-progestin hormone replacement therapy poses some risks which most women have heard about: breast and ovarian cancers, blood clots, increased risk of dementia, and increased risk of heart attack or stroke, particularly in women 10 or more years past menopause.

Furthermore, there is no guarantee conventional estrogen-progestin HRT will work. Estrogen may reduce the frequency or severity of hot flashes, but quite often it does not, and estrogen is associated with weight gain. Progestin is not true human progesterone, and can worsen mood changes or cause depression and have other side effects, such as headaches, diarrhea, and breast tenderness.

The Women's Health Initiative, a 15-year study of more than 161,000 women, concluded that the risks of estrogen-progestin combination hormone therapy outweighed the benefits. It stopped the estrogen-only study in the interest of safety due to health risks.

Likewise, unwanted side effects and risks are associated with medications designed to treat specific symptoms of menopause, such as osteoporosis. In fact, the U.S. Food and Drug Administration (FDA) issued a warning to doctors that bone-building drugs such as Fosamax, Actonel, and Reclast may actually make bones weaker while increasing the risk of serious side effects.

Progesterone vs. Progestin and Menopause

Progesterone is the natural hormone produced by the ovaries, progestin is not.

Naturally occurring progesterone maintains sex drive, works as a natural antidepressant, calms the mind, and improves sleep. Bioidentical progesterone is created is by extracting diosgenin from yams or soy and converting the diosgenin molecules into pregnenolone and then to progesterone. The body recognizes bioidentical progesterone and there are no adverse reactions if the correct balance is maintained. Progesterone is available as over-the-counter supplements and creams, but these products are not regulated by the FDA

so formulations are unreliable.
According to a British report, OTC Progest cream, for example, was found to contain 100 mg progesterone per ounce rather than the 465 mg claimed by the manufacturer. Also, women are not aware that products containing "wild yams" do nothing to increase progesterone because the human body cannot synthesize progesterone from the diosgenin contained in yams. Prescription progesterone is far more reliable and is available in as a cream or gel, in pill form, and as an injectable. Injectable progesterone is the most effective and most controlled form of hormone replacement therapy for menopause. Progesterone has no known side-effects and is considered safe enough to be used during pregnancy. Unlike progestin-estrogen therapy, progesterone combined with estrogen is a viable treatment for the symptoms of menopause.

Growth Hormone as a Treatment for Menopause

Human growth hormone (HGH) controls numerous other hormones, directly and indirectly affecting every cell in the body. Growth hormone is produced by the pituitary gland and declines as women age, along with estrogen and progesterone. There are two forms of pharmaceutical HGH (recombinant DNA HGH): somatropin (indistinguishable from human HGH in blood and urine tests) and somatrem (a synthetic form with an extra amino acid, sometimes called 192.) Somatropin has a short half-life in the bloodstream (30 minutes or less) but acts upon the body's cells for up to 17 hours. Very little research has been done on growth hormone as a treatment for

menopause, because most studies have focused on older men. Nonetheless, I have firsthand experience that HGH has benefits that counteract the most pronounced effects of menopause, including mood changes, increased body fat, and loss of bone density.

One woman said: At 52, I started taking Humatrope and the menopause symptoms stopped and my monthly cycle became regular. I found I didn't need the other hormone replacement therapy (estrogen and progesterone) so I stopped them except for DHEA. No more night sweats and no more hot flashes, thank God. I've been on HGH since 2001.

Menopause and Low Thyroid

According to the American Association of Clinical Endocrinologists, millions of women with menopause systems may be suffering from undiagnosed thyroid disease. Symptoms frequently associated with menopause, including mood swings, depression, and fatigue and sleep disturbance, are also signs of hypothyroidism (low thyroid hormones). Only 1 in 4 women who discuss their menopause symptoms with their primary care doctor are tested for thyroid disease.

Menopause and Low Cortisol

If the adrenal glands are stressed to the point that they can no longer produce sufficient cortisol, adrenal fatigue results. The adrenals produce the precursors for estrogen and progesterone, so cortisol deficiency will trigger a decline in estrogen and progesterone, causing menopausal symptoms such as chronic fatigue, weight gain, and irritability. Further, adrenal fatigue is associated with low growth hormone because the pituitary hormone ACTH regulates production of cortisol. A number of people who lack ACTH also lack growth hormone. The National Institutes of Health (NIH) has released a warning that people should be tested for ACTH production prior to growth hormone replacement therapy, because a lack of ACTH can lead to adrenal crisis.

Menopause and Low DHEA

The adrenals also produce DHEA and androstenedione, which are precursors for estrogens and testosterone required throughout life for optimum functioning. Women need testosterone in small amounts, and testosterone is also converted into estradiol, an important female sex hormone. During stress, production of these hormones rises dramatically along with cortisol, causing issues such as bone loss.

Mainstream medicine does not conduct adrenal testing to determine the stages and severity of adrenal gland stress. With adrenal fatigue, DHEA production drops off – as it also does with age – so the transition into menopause is worsened

by the absence of estrogen and testosterone precursors and menopausal symptoms such as mood instability and hot flashes increase.

DHEA functions in conjunction with the adrenals (cortisol), and a deficiency in one can manifest as an excess of the other. In postmenopausal women, DHEA is the precursor for androstenedione, and thus for testosterone, estradiol, and estrogen. Low DHEA levels are associated with low libido. Supplementation with DHEA has been shown to improve libido, hot flashes, depression, and can help with androgen deficiency symptoms such as vaginal dryness and decreased bone density.

Testing salivary DHEA/DHEA-S and cortisol levels can identify how effectively women are responding to stress. A woman with high cortisol and DHEA (a normal response to stress) would not need the same treatment as a woman whose adrenals are in the exhaustion stage.
Hormone therapy not only requires balancing of DHEA and cortisol, it requires supplementation of the vitamins and minerals needed to support the hormones involved in menopause:

- Vitamin C – supports epinephrine and norepinephrine synthesis
- Vitamin B1, B5, Magnesium – needed for DHEA and cortisol synthesis, carbohydrate metabolism and conversion of fats and sugars in adenosine triphosphate molecules (ATP), which are used by cells for energy
- Vitamin B6, Tyrosine – support epinephrine and norepinephrine synthesis

Melatonin and Menopause

Melatonin, a hormone secreted by the pineal gland in the brain, is regulates circadian rhythms and sleep. Light disrupts the production of melatonin so people who stay up late and sleep late usually have melatonin imbalances. Melatonin also helps control the timing and release of female hormones, including when a women enters menopause. Finally, it is a strong antioxidant and strengthens the immune system.

Melatonin supplementation is extremely useful in overcoming the sleep disorders of menopause. Small doses can even ease the anxiety of nicotine and benzodiazepine withdrawal. It has no known serious side effects, unless injected at mega-doses. Melatonin is available as OTC pills or creams, but these forms do not function like the body's own melatonin. In pill form, it causes a burst in the brain and rapidly leaves the body. Creams may not be properly absorbed.
Small amounts (around 1 mg) are best for most purposes, including falling asleep, but as part of a medically supervised hormone therapy program, melatonin can be given via injection or patches at larger doses along with other hormones.

SECTION 4

Low Thyroid Syndrome in Women

The majority of the 60 million Americans who have thyroid imbalances go undiagnosed. Most are women, because the symptoms of low thyroid are frequently attributed to menopause.

In fact, low thyroid mimics the symptoms of menopause, and can even trigger menopause, estrogen will block the production of thyroid hormones. When treating the symptoms of menopause, doctors frequently miss the presence of an under-active thyroid, and the administration of estrogen hormones will make the condition worse. In addition, women need more thyroid hormones than men do, so deficiencies are often under-diagnosed.

Do You Have A Hidden Thyroid Problem?

- Do you find it difficult to lose weight, even if you starve yourself?
- Do you have swelling or puffiness around your eyes, in your feet and toes, or in your hands?
- Do you find yourself craving sweets and carbohydrates?
- Do you get shaky or nervous if you don't eat?
- Is your sex drive much lower than it used to be?
- Do you feel rundown, sluggish, or fatigued most of the time?

  Do you wake up feeling tired, no matter how much sleep you get?
- Do you need caffeine to wake up or stay alert during the day?
- Are you experiencing mood changes, such as feeling depressed for no reason?
- Do you sometimes experience sudden nervousness or even panic attack?
- Do you have difficulty concentrating or remembering things? Do you feel sensitive to cold weather?
- Do you have unexplained joint and muscle aches?
- Do you ever have unusual heart rhythms, such as palpitations?
- Are your eyebrows thinning?
- Is your hair dry, brittle, or falling out?
- Are your nails breaking easily or growing slowly?
- Do you have high cholesterol?
- Do you have difficulty swallowing?

- Are you having difficulty falling asleep and staying asleep?
- Are your eyes dry, scratchy, or sensitive to light?
- Are you getting recurrent sinus infections?
- Do you have ringing in the years, known as tinnitus?
- Has your voice become hoarse or raspy?
- Is your skin dry, patchy or flaky?

These are all classic symptoms of low thyroid hormone (hypothyroidism). Primary symptoms of low thyroid include a slowed or sluggish metabolism, weight, fatigue, and depression.

One of the most common causes of hypothyroidism is Hashimoto's Disease, an autoimmune disorder in which antibodies attack the thyroid and gradually destroy its ability to produce thyroid hormone. Severe hypothyroidism can cause symptoms similar to Alzheimer's disease, or can mimic psychological disorders.

Thyroid hormone helps control heart rate and blood pressure, so arrhythmias are common in people with low thyroid levels. Hypothyroidism also weakens the diaphragm muscles, impairing breathing and causing extreme fatigue. Growth hormone therapy increases thyroid hormone levels, and the two work synergistically to enhance metabolic function.

How Is Low Thyroid Related To Growth Hormone?

The thyroid hormones T3 and T4 are primarily responsible for metabolism. Like growth hormone, they are important for protein synthesis and the metabolism of fat and carbohydrates. They work in synergy with growth hormone to produce long bone growth.

The production of T3 and T4 is triggered by the release of TSH by the anterior pituitary gland, which also synthesizes growth hormone.
Thyroid hormone is the only biochemical molecule known to incorporate iodine, and iodine was added to table salt because lack of iodine in the American diet was causing growth abnormalities in children and goiter in adults.

Many scientists believe that nicotine, alcohol, and drug addictions are related to the abilities of these substances to block the breakdown of T3 in the brain or increase the brain's synthesis of T3 into T4.

Women who have a deficiency in either thyroid hormone or growth hormone will also have an imbalance in the other. Growth hormone and thyroid hormone have complex interactions in the body. Growth hormone therapy will increase thyroid hormone levels. The thyroid requires the presence of insulin or insulin-like growth factor (IGF1) to initiate production of its hormones.

So any thyroid hormone replacement program should take into account insulin and IGF1. Both of these are directly involved in growth hormone production as well. In fact, growth hormone is able to convert the inactive form of thyroid

hormone, T4, into the active form, T3.
Interactions between growth hormone, IGF-1, and thyroid hormone are responsible for the fat-burning, metabolic qualities desired in growth hormone levels.

When growth hormone is administered therapeutically, T4 must also be administered to keep the system in balance. This is important, because T3 used with growth hormone will actually decrease anabolic activity. The conversion of T4 into T3 by growth hormone is required to obtain maximum benefits.

How is Low Thyroid Syndrome Diagnosed?

Low thyroid is diagnosed by a doctor after consulting with the patient, and confirmed by blood tests. In the early stages of hypothyroidism, the levels of T3 and T4 may be normal. In conventional medicine, the main tool for identifying subclinical hypothyroidism is to measure TSH (thyroid stimulating hormone).

If thyroid levels are low, the pituitary will react by producing more TSH and blood levels of TSH will be abnormally high. This stage of hypothyroidism can precede the actual burnout of the thyroid by months or even years. However, if the decrease in thyroid hormone is due to pituitary disease or a dysfunction in the hypothalamus, TSH will remain low even the individual in a state subclinical hypothyroidism.

While blood work can confirm the diagnosis of low thyroid levels, it cannot determine the underlying cause. A complete blood panel needs to be done and you must be evaluated by a qualified doctor.

How Is Low Thyroid Treated?

Low thyroid is conventionally treated with T4 in oral form (Levoxyl, Synthroid). We use bioidentical thyroid hormone or thyrotropin- releasing hormone is injectable form.

Most patients do well with injections of T4 and TSH.

In patients who suffer from inflammatory autoimmune conditions, we use a combination of T4 and T3, because the inflammation suppressed the hypothalamus-pituitary (HPT) axis.

One study showed that single injection of the inflammatory cytokine reduced blood levels of TSH, T3, TS4, and TRH for 5 days. Further, we recommend growth hormone for its own sake as well as for its beneficial relationship to thyroid hormone production. Once treatment is initiated, it needs to continue for a lifetime to maintain its result.

SECTION 5

Adrenal Fatigue in Women

The main sign of adrenal fatigue in women is bone-weary, butt-dragging, absolute fatigue. If you need coffee to stay awake, yet have trouble falling and staying asleep, you are probably in a state of adrenal fatigue.

The adrenal glands are two small glands that sit above the kidneys and produce the hormones cortisol, DHEA, and norepinephrine (adrenalin), among others. In response to stress, adrenaline will produce the "fight or flight" response.

Cortisol increases energy levels and keeps the body inflammatory system in check. It helps the body release energy and fight off infection and inflammation.

Synthetic versions (prednisone and cortisone) are commonly used to counteract inflammation. DHEA is an androgen produced by the ovaries as well as the adrenal glands, and protects bone density, the immune system, and libido. It also has a calming effect. When cortisol is up, DHEA is down, and vice versa. The body is designed to release small amounts of

cortisol on occasional basis, but the stress of modern life pushes the adrenals into producing cortisol to the point of exhaustion, or adrenal fatigue.

What Are The Symptoms Of Adrenal Fatigue?

If you are chronically tired and have lost interest in sex, it may be due to the fact your adrenals are no longer pumping out DHEA, which is the main hormone used by the body to manufacture the testosterone needed by women to maintain their sex drive. Adrenal fatigue can manifest itself as:

- Fatigue, exhaustion, chronic tiredness Trouble falling and staying asleep
- Needing caffeine or other stimulants to stay awake during the day
- Cravings for salt and sugar
- Digestive troubles and heartburn, frequent diarrhea
- Generalized malaise, irritability, and aches and joint pain

What Causes Adrenal Fatigue in Women?

In a nutshell, being women. Modern women function at a pace and level of stress beyond the physiological capacity of the body. Women frequently lack the nutrients needed to support adrenal function, due to the consumption of processed foods. Adrenal fatigue is seen in single mothers, career women, and women going through emotional stress such as relationship issues or divorce.

Adrenal fatigue can be triggered by physical stress, including pregnancy, yo-yo dieting, surgery, illness, or infection. A frequently overlooked cause of adrenal fatigue is malnutrition resulting from the American Standard Diet (SAD), including hidden food allergies.

How Is Adrenal Fatigue Treated?

Treatment for adrenal fatigue usually requires a comprehensive program of bioidentical hormone therapy along with nutritional changes, lifestyle changes, and nutraceuticals (pharmaceutical-grade vitamins and minerals). Adrenal fatigue in women is almost always accompanies by other hormone deficiencies, including growth hormone. Adrenal fatigue is common in menopausal women and hormone therapy for menopause should include treatment for adrenal fatigue.

Source: Work by Dr. James L. Wilson, an early pioneer in researching adrenal fatigue and a founding father of the Ontario College of Naturopathic Medicine, has written the textbook on adrenal fatigue: Adrenal Fatigue: The 21st Century Stress Syndrome. He has also created the definite self-assessment tool for identifying the symptoms of adrenal fatigue.

SECTION 6

Women and Bioidentical Hormones

Synthetic hormones have serious, proven health risks for women that have not been associated with the use of bioidentical hormones.

Most of the controversy surrounding hormone replacement therapy (HRT) in women relates to synthetic estrogens and progestin. The risks clearly outweigh the rewards, and use of conventional hormone replacement has dropped by 50% in recent years. More women are turning to bioidentical hormones, which are identical to the ones produced by your body.

Unlike mass-produced commercial products, bioidentical hormones can be custom-formulated to your needs by a compounding pharmacy. Synthetic hormones can have harsh side effects, but bioidentical hormones are natural and easily absorbed by the body. Even though bioidentical hormones have been around for years, mainstream doctors have not prescribed them.

European studies confirm our clinical observations that bioidentical, or "human" hormones are safer and better tolerated than synthetic, non-human, or patentable hormone drugs.

Bioidentical hormone replacement therapy includes regular testing of blood or saliva hormone levels, whereas testing is not done on an ongoing basis during the use of commercial products

Bioidentical hormones are individualized doses made in small batches by a compounding pharmacy, whereas commercial products are mass- produced “one size fits all” products

Bioidentical hormones can be adjusted to obtain optimal wellness, not just relief of symptoms such as mood swings
Bioidentical hormones are recognized and metabolized as natural hormones.

Estrogens

Unlike testosterone, estrogen is not a single hormone. Women are more complex that men, even when it comes to their hormones.
Premenopausal women produce estrogen in the form of estradiol (produced primarily by the ovaries). After menopause, the majority of estrogen is in the form of estrone (produced in fat cells). Estriol is produced during pregnancy and is not available as a mass-produced pharmaceutical in the U.S. or Canada, although it is commonly prescribed in Europe and the UK. It can be made by compounding pharmacies, usually in a topical form. In response to the controversy that surrounds estrogen replacement therapy, Dr. Holly Thacker, director of the Cleveland Clinic Center for Specialized

Women's Health, stated, "Women need to know that estrogen replacement is an important part of therapy, especially for women who are in their 50s and have had a hysterectomy and their ovaries removed."

The benefits of estrogen replacement therapy for women:

- Reduced hot flashes
- Greater mood stability and decreased mood swings
- Increased HDL (good cholesterol)
- Reduced risk of mortality each year over 10 years
- Better outcomes than hormone placement without estrogen

Progesterone

Progesterone is available as both an oral and a transdermal product. Unlike the non-human form, progestin, progesterone is a bioidentical/human hormone. It has been found to have a reduced risk of breast cancer in a French study and is more reliable than progestin in treating the sleep disorders experienced in menopause.

More than a dozen studies have shown that progestin (synthetic progesterone) has unwanted effects, included increased risk of breast cancer. In contrast, studies show that progesterone has a decreased risk of breast cancer. (Reference: Int J Cancer. 2005;114:448-54, Cancer Detect Prev. 1999;23(4):290-6)

The benefits of progesterone replacement therapy for women:

- Improved sleep, deeper sleep, longer sleep
- Raises "good" cholesterol

- Helps prevent cardiovascular disease and atherosclerosis
- Counteracts stress
- Increases metabolism and decreases abdominal fat

Menopause and Insulin Resistance

Menopause stresses the female physiology, raising insulin. Insulin for normal metabolism, but in combination with cortisol is thought to be responsible for "belly fat." The two, when combined together in high amounts over a prolonged period of time, push the female body into storing fat and reducing the amount of fat burned for energy. Chronic high levels of insulin create insulin resistance, the beginning of diabetes.

When young, a woman's body counteracts this with growth hormone, which has the opposite effects and homeostasis in achieved. In menopause, growth hormone levels have declined so chronically high levels of insulin go unchecked. Many women have the mistaken idea that insulin resistance occurs only in women who are overweight.

Sugar and fat in any quantities spike insulin and so do many of the preservatives in modern foods. After a while, the body can no longer release insulin in response to sugars and fats (blood glucose). The result is insulin resistance. Because the body can no longer absorb the extra glucose, the liver turns it into fat. However, the body is starved for energy (glucose being the most available form). A vicious cycle begins, characterized by cravings for sweets and fat gain. Menopausal women are prone to insulin resistance due to fluctuations in adrenal and thyroid hormones.

About Human Chorionic Gonadotropic (HCG)

HCG hormone, found in the urine of pregnant women, is commonly used in weight loss programs. The theory is that it will suppress hunger and trigger the body to use fat for fuel, while maintaining lean muscle mass. Many women think they are taking growth hormone when in fact they are taking HCG. The two have nothing in common, and while HGH has been shown in clinical studies to promote fat loss, HGH requires a 500-calorie diet (the HCG Diet) which puts the body into starvation mode and will ultimately boomerang into greater, not lesser, amounts of body fat. As of 2011, the FDA has prohibited the sale of over-the-counter HCG products, declaring them fraudulent.

However, HCG injections are still available through weight-loss clinic as prescribed injections.

SECTION 7

Women: Is HGH Right For You?

Whereas men turn to growth hormone for its ability to build lean muscle mass, women are using growth hormone for weight loss. Growth hormone enables women to improve their body-fat ratio, stimulates the metabolism, and reduces the risk of osteoporosis. It is effective in treating the symptoms of menopause – sometimes more effective than estrogen and progesterone. Growth hormone also promotes sleep, cell regeneration, skin elasticity, hair growth – all related to a youthful appearance. In fact, growth hormone is at its peak when we are young, and drops dramatically as women begin to age.

Do You Have Growth Hormone Deficiency?

To be diagnosed with growth hormone deficiency, you must see a doctor who is experienced in integrative, anti-aging (or

age management), and functional medicine.

Blood tests in combination with a physical examination and patient history are required for a valid diagnosis of HGH (growth hormone) deficiency.

I have treated growth hormone deficiencies for decades and led the movement toward using hormone therapy to restore wellness and a positive quality of life. Women who have been treated by me or affiliated clinics around the nation report similar symptoms of low HGH:

- Weight gain, an increase in fat around the abdomen, difficulty losing weight despite
- Fatigue, loss of energy, lethargy, and "the blues"
- A loss of interest in sex, problems in their intimate relationships
- Loss of skin elasticity, loss of muscle tone, hair loss
- Memory problems, trouble concentrating or multitasking
- In women, the symptoms of growth hormone deficiency are amplified by other hormone deficiencies, including low thyroid, and menopause-related hormone imbalances. It is more likely that you suffer from several hormone imbalances that contribute to an imbalanced endocrine system.
- If you feel exhausted most of the time, have trouble sleeping, can't lose weight, feel depressed and lethargic – growth hormone alone may not be to blame.

What Can You Expect From Growth Hormone?

Results of HGH therapy in women vary depending on age, activity levels, nutrition along with other hormone levels. Nonetheless, growth hormone has definite general health

benefits. It has been called everything from “the fountain of youth” to the “sexy hormone.” Growth hormone therapy benefits usually begin to appear within a matter of weeks, and include:

- Increased fat loss, leaner body, improved muscle tone
- A decrease in wrinkles, improved skin texture and elasticity
- Improved energy and daily stamina
- Improved memory, cognitive ability and focus
- Increased bone density, reduced risk of osteoporosis
- Decreased risk of heart attack and diabetes
- Improved immune system and resistance to allergies

Why Should You Start Growth Hormone?

The benefits of growth hormone have not been studied as extensively in women as in men. However, women use growth hormone for many of the same reasons. Growth hormone therapy can be costly, so it should only be undertaken in the context of a comprehensive approach to hormone management. By balancing growth hormone in relationship to other hormones such as thyroid, cortisol and the “menopause hormones,” women can see dramatic improvements in both their appearance and feeling of wellbeing. Any woman over the age of 35 should consider being tested for hormone deficiencies and imbalances as the first step in improving her quality of life.

SECTION 8

One Woman's Story

Janet, at 61 years old, had been experiencing the symptoms of menopause for more than a decade.

When questioned, shoe spoke about fatigue, weight gain, insomnia, hot flashes, arthritis and aching joints, and depression. Her marriage was on the rocks because she was not interested in intimacy with her husband, and in fact, she was too chronically miserable to be interested in much of anything. She had all the classic signs of menopause and had been on synthetic estrogen and progestin, prescribed by her gynecologist. The patch helped with the hot flashes, but made her gain weight and feels nervous. Overall, she felt and looked at least 10 year solder than she really was.

Feeling old led her to come see us. She had lost her enjoyment in life and did not like what she saw in the mirror. Far from being the vibrant woman she had been before menopause, she was now stiff, had difficulty getting up out of a chair, and had the wrinkles and sagging abdomen of old age.

"My boobs are like old socks and my knees are wrinkly and fat. I feel like a hideous old woman and I don't want my husband to see me, let alone touch me." Her symptoms were all indicative of hormone deficiencies. Lack of estrogen was causing her hot flashes. Her sagging skin, nervousness, and stiffness were due to growth hormone deficiency. A combination of deficiencies in growth hormone, testosterone, and DHEA were causing her weight gain, especially "belly fat." Her lack of energy and low libido were due to low testosterone, low thyroid, and low growth hormone. Hormone replacement therapy was indicated by her physical symptoms, and was confirmed by the results of her lab work.

Her DHEA was at 95 lm, well below the optimal threshold of 200. Her thyroid (T3) was clinically subnormal at 3. 0. Estrone was low, and her estradiol was two times higher than it should have been. Her IGF-1, which should have been above 220, was at 160.

Janet began a regimen of hormone replacement using bioidentical hormones, which included estriol, progesterone, DHEA, testosterone, and growth hormone. Within a month, she was sleeping better and longer, she had more energy, she was less depressed and more interested in life. Hormone therapy alone did not do the trick.

Janet also changed her eating habits, began a program of exercise, and took nutraceuticals. She worked with her patient care specialist to get over some of the bumps in the road, for example working out a diet plan of foods that both she and her husband liked.

By the second month, Janet had improved skin texture and elasticity, she had lost body fat, her muscle tone was better

and her strength was improved, and her libido had returned.

By the third month, her memory was sharp, she had an easier time dealing with stress, her hair had improved texture, she was no longer stiff, and she looked noticeably different. "My friends asked me if what I had done. They couldn't understand the change in me. One even accused me of having a secret love affair. It is really unbelievable how different I look and feel." Because Janet is on bioidentical hormones, she is not experiencing any side effects. By month six, she was a completely new woman.

CHAPTER 5

Choosing the Right HRT Provider

Explosive demand for growth hormone has more than tripled over the last few years. U.S. pharmaceutical sales of growth hormone are now $1.4 billion annually.

The benefits of growth hormone are all over the news: growth hormone does, in fact, reduce and even reverse many of the signs of aging. Consumer demand has spawned the opening of numerous clinics. Many people go through a painful process of trying different clinics, only to be disappointed.
Without proper medical supervision, patients risk long-term side effects including diabetes and cardiovascular risks. Ironically, in the right hands, growth hormone can decrease the risk of both diabetes and cardiovascular disease.

SECTION 1

Things to Know

To get growth hormone injections legally, you need a prescription from a licensed doctor practicing in the U.S. And by law, the doctor should only prescribe FDA approved growth hormone.

Be Suspicious Of Any Doctor Who Is Too Quick To Prescribe Growth Hormone Injections.

If you search on the Internet, you will find numerous doctors and clinics who are selling growth hormone injections. They make it sound very easy to get growth hormone injections, almost like buying a high performance automobile - expensive, but easy to obtain as long as you have the money.

Some of these doctors make no big deal out of prescribing growth hormone to young men who want it to pack on muscle, even though their skeletal frames and bone platelets may not have fused and growth hormone could cause bone growth abnormalities. No doctor who is committed to your health will

prescribe growth hormone in this way.

In the U. S., growth hormone is regulated by the FDA and must be prescribed for legitimate reasons. A doctor can lose his medical license and face criminal prosecution if he prescribes growth hormone without a sound medical diagnosis.

Growth hormone needs to be part of a comprehensive hormone balancing program in order to be truly effective, and discount clinics are not able to provide sophisticated hormone replacement therapy (HRT) services.

Very Few Doctors Know How to Prescribe Growth Hormone

Any U.S. doctor can legally prescribe growth hormone. There are very few doctors who truly understand how to use growth hormone to provide optimal wellness, especially in combination with low T or menopause-related hormone deficiencies. Growth hormone is only one of approximately 80 hormones that have a powerful impact upon your wellbeing. So putting growth hormone within the context of other hormones is critically important.

Where to Buy Injectable Growth Hormone

HGH costs can be quite high if you use FDA-approved drugs, but these are the only legal form of growth hormones. Because costs are high and demand is high, there are a large number of black market operations selling fake, illegal, or even

dangerous HGH products. Most of these illegal companies operate online. There are also a lot of HGH scams, which dupe customers by selling products, which have nothing to do with the effectiveness of growth hormone.

Growth hormone is injected just like insulin, subcutaneously (below the skin) and usually into the fatty tissue of the belly. Growth hormone comes in two forms: as a lyophilized (freeze-dried) powder which must be reconstituted before injection, or as more convenient pens that are pre-filled with medication and have an easy-to-use dosing dial. Like the lyophilized form of growth hormone, these pens must be refrigerated and used within 3 to 4 weeks.

Cost

Probably the first thing people look at is cost. Hormone replacement therapy can be expensive, especially if it includes growth hormone, and usually it is not covered by insurance.

Cheapest:
People can try to treat themselves by following online advice and buying black market hormones without a prescription. There are variations of this scenario, but all of them are illegal. Bodybuilders frequently follow this route. Cost, more than anything including their health, is their driving motivation.

Google "HRT" and you will see clinics advertising hormone replacement therapy for "as low as" $150 a month. Usually this is a bare bones price. When you go in for your "free consultation" the sales person will gauge how much you are willing to spend and the price will go from there. It is

absolutely impossible to prescribe a medically sound hormone replacement program with all the necessary testing, and handholding at this price. Something has to give, so if the price stays low, it means your level of service and the quality of your hormone replacement program will be low as well.

Relatively Cheap

Get blood tests from your primary care physician and hope he prescribes what you need. The problem is most mainstream doctors do not have clue about hormone replacement therapy. He will not prescribe the right tests or interpret them correctly. The results are ineffective and therefore a waste of money, unless you require a very limited regimen of one or two hormones... a situation that almost never occurs in real life. Even very limited estrogen-progestin therapy for women costs about $1,000 for the blood tests, plus $200 for the initial doctor visit, with brand name estrogen-progesterone costing around $85 (without insurance), plus follow-up lab work and doctor's visits.

Source: www.health.costhelper.com/hormone-replacement-therapy.html

Not Cheap

This covers a lot of ground, anywhere from mediocre programs to topnotch cutting edge clinics. This is where most people who want legal, doctor-prescribe growth hormone have trouble choosing the right program. The price of these programs is anywhere from $800 a month to $2200 a month, excluding growth hormone drugs. Growth hormone can add another $1,500 a month or more to the cost. In this range, look at length of time in business, locations, medical quality, service, and reputation. All of these factors will help you make up your mind.

Length of Time in Business

Longevity says a lot. Clinics that skirt the law tend to face legal problems and shut down. This has happened even to very large clinics with large clients groups. One well-known clinic in Palm Beach with 4,000 clients was shut down by the DEA in 2011 for selling controlled drugs illegally. If profits are at the forefront of a clinic's priorities, then client health and safety will be on the back burner. Be dubious if it is too easy to get prescribed injectable hormones; your health may be at risk.

A legitimate clinic should have been in business at least 8 years, preferably more. A legitimate clinic should be listed with the Better Business Bureau (BBB). A legitimate clinic should not be owned by someone with a criminal past or ties to the Russian mob (this has been more common than you might think).

Locations

Branch locations are usually staffed by doctors who have bought into the clinics approach to hormone therapy in some way. If the clinic is engaged in shady practices, the doctor risks losing his license and worse. So when a clinic has a large number of clinics and a large number of doctors with good credentials, you can be pretty certain good medicine is going on. You do not have to have an HRT clinic near you to be able to use one. Most of the bigger companies can make

arrangements for you to fly in, see the doctors, have your lab work done, and set up your program. If you are primarily concerned with cost, this will not be worth the expense to you. If you are primarily concerned with your health and results, then seeing the best specialists is worth any travel time. A legitimate clinic will not prescribe medications over Skype or any other remote tool, without seeing you in person!

Medical Quality

Medical quality should be your paramount consideration. If you can't afford a top-of-the-line HRT clinic, then try to work on lifestyle and nutritional changes that will be beneficial. Do not embark upon a "partway" program because hormones are an all or nothing affair. One hormone can upset the entire apple cart, so it is too risky too start playing around with injectable hormones. If you use homeopathic or dietary supplements, usually the amounts are too small to do much good but they are also too small to kill you. Quality medical care is expensive. If the price is too good to be true, it usually is. Look for memberships in the American Academy of Anti-Aging, American College for Advancement in Medicine, Age Management Medicine. Group, the Endocrine Society, the Institute of Functional Medicine Look at the qualifications of the doctors and how long they have involved in the anti-aging or related fields Consider whether the clinic includes lifestyle and nutrition components in their program, because this is an indication that the clinic is serious about health. Hormones are not a magic bullet and do not work without an appropriate lifestyle.

A good clinic will refuse to prescribe to you if you are under 30 or want hormones in order to enhance performance as a bodybuilder or competitive athlete.

Service

Larger, more established HRT clinics will assign a patient care specialist to you. This individual will set up your lab work and be the go-to person on everything from having a question about your prescription to wondering what your lab results mean. You want someone who will give you a consistently high level of service. It sometimes is the make-or-break factor in a successful hormone therapy program. Call for a free consultation. If the sales rep is pushy or obnoxious, you probably do not want to deal with that clinic. If you like the sales rep, ask them how long they have been at the company, what they like about it, and why they do what they do for a living. His (or her) answers will tell you a lot about the mindset and values of the organization.

Get a Free Consultation

Before you choose a hormone replacement therapy provider, meet with them to discuss their program. Ethical companies will be happy to discuss your goals and answer your questions before you become a client.

HealthGAINS

Optimizing Vitality since 2003

SECTION 2

About HealthGAINS

HealthGAINS is one of the world leaders in hormone management for adults. As the pioneers in treating adult hormone deficiencies to achieve optimal wellness, we are uniquely qualified to help adults of all ages regain a rich, fuller, and more satisfying quality of life.

HealthGAINS is a nationwide group of hormone replacement specialists and growth hormone experts. We are one of the leading providers of health and wellness medicine in the world. We provide the benefits of integrative and functional medicine to adults over the age of 30 who want a more active and fulfilled lifestyle.

Unlike traditional medicine, which focuses on the treatment of specific disorders and conditions, our focus is holistic and devoted to improving your overall health and wellbeing. Hormone replacement therapy is one of the most effective ways of achieving optimum health within the context of a healthy lifestyle.

The Pioneers in Hormone Replacement Therapy

HealthGAINS specializes in hormone replacement therapy for men and women. We provide a comprehensive approach to hormone management and endocrine system wellness using bioidentical hormones. We are one of the oldest and most respected providers of hormone management therapies in the world, and pioneered the use of hormone replacement therapy in age-related deficiencies. Our doctors are experts in total hormone management. In fact, we pioneered the field of hormone management in adults. We have been treating men and women with hormone deficiencies for more than a decade.

A Physician-Guided Treatment Program

Our doctors include the leading names in anti-aging medicine, functional medicine, and integrative medicine. We are a physician- developed program created by a top panel of experts in the fields of endocrinology, anti-aging and regenerative medicine, functional medicine, and integrative wellness. When you come to one of our clinics, you are seen and evaluated by a team of physicians and undergo a comprehensive exam which includes extensive lab work, analysis of your endocrine, cardiovascular, metabolic and immune systems, and a detailed review of your medical history.

Is HealthGAINS an Anti-Aging Clinic?

Yes and no. Our patients experience the anti-aging benefits of hormone replacement therapy (HRT) and our doctors are renowned specialists in anti-aging. However, we go one step further. We do not focus on age as the main criteria in choosing the most beneficial course of hormone replacement therapy, including growth hormone replacement. Instead we look at benchmarks of wellness including:

- Your general level of energy and endurance
- Your mood, optimism, and sense of self-confidence
- Your weight and more specifically your ratio of lean muscle to fat and the speed with which your metabolism burns fat for energy
- Your libido and overall sexual performance Health and wellness levels, including your cardiovascular functioning, risk of diabetes, cholesterol profile, bone density

Who is on Your HGH Treatment Team?

Your hormone replacement therapy involves a multidisciplinary team, including:

The HRT Therapy Medical Board

The Medical Board reviews and evaluates the latest research in hormone replacement therapy in order to keep our medical

doctors on the cutting edge of scientific advancements. The Medical Board also provides ongoing education in the latest treatment protocols as endorsed by the American Academy of Anti-Aging Medicine (A4M), the Age Management Medicine Group (AMMG), the American College for Advancement in Medicine (ACAM), the Endocrine Society, and the Institute of Functional Medicine (IFM).

The HRT Therapy Medical Team

The medical team handles patient medical care, including lab testing, medical diagnoses, making treatment recommendations, writing prescriptions, and providing follow-up monitoring. The medical team works under a chief medical advisor to provide the most effective and safest treatment possible.

The HRT Therapy Patient Services Team

Patient service specialists provide the day-to-day services needed to keep your hormone replacement therapy on track. They schedule lab testing, make appointments for doctor consultations, and develop a personalized lifestyle plan to assist you in achieving optimal results from hormone replacement therapy, including growth hormone replacement therapy. This includes providing you with a plan to boost growth hormone naturally through nutrition and exercise.

The HRT Therapy Office Administration Team

The office administration team works behind the scene to

coordinate the teams and doctors involved in your HRT program. They make sure that all legal requirements are met, assist in scheduling testing, and coordinate the delivery of medications from qualified pharmacies to our patients.

Clinic Locations

We have four flagship centers: Aventura, Miami Beach, New York and Chicago.
We also have clinics in major metropolitan areas nationwide and work with an extensive network of Physicians. Wherever you live, we can help you enjoy a healthier, more vibrant life.

Free Consultation

We are happy to provide a no-risk, no-obligation consultation.

To find out if you are a candidate for growth hormone replacement therapy, please visit us at HealthGAINS.com

SECTION 3

FAQs Frequently Asked Questions

HealthGAINS is part of a nationwide health and wellness program based upon the principles of integrative medicine.

HealthGAINS specializes in the treatment of adult growth hormone deficiency. HealthGAINS provides prescribes growth hormone in the context of a comprehensive program of hormone and lifestyle management that includes nutrition, fitness, and quality nutraceutical supplements.

What Is Hormone Management?

HealthGAINS practices the complex management of hormones to achieve optimal wellness, not simply relief from

the symptoms of disease and illness. The goal of hormone management is to restore endocrine balance and functioning to their peak levels.

Do I Need To See A Doctor?

Yes, hormones are controlled drugs that must be prescribed and supervised by a qualified physician. At HealthGAINS, you will be seen and treated by a team of leading specialists in the fields of preventative medicine, age management, and hormone replacement therapy. The first step is to be seen and evaluated by an HGH physician. After an exam and appropriate tests, a treatment plan and prescriptions for recommended hormones will be provided based upon your individual diagnosis and health status.

Can I Be Treated Over The Phone Or Online?

No, sound medical practice and FDA guidelines are clear that patients undergoing hormone replacement therapy must be seen and supervised in person by a qualified U.S. physician.

What If There Is No Center Nearby?

We have centers throughout the US, but if one is not near you, we work with a network of doctors who are experienced in hormone replacement therapy. These doctors are located in every major metro area in the U.S. We can arrange to have

your lab work done locally and for your initial evaluation to be completed near your home or place of business. If you require complex hormone management, we prefer to see you at one of our centers, where we have specialized equipment and physicians who are experienced in very sophisticated hormone replacement programs. Usually this will take no more than a day or two and we can coordinate travel arrangements for you and arrange accommodations at a VIP rate at a nearby hotel.

Do I Need A Blood Test?

Yes, at the very minimum for growth hormone replacement therapy, you need specialized blood test and evaluation. Additional testing may be required in order to determine a diagnosis of adult growth hormone deficiency. We can often arrange for a phlebotomist to visit your home or office to draw blood samples required for testing.

Will My Health Insurance Cover It?

Health insurance rarely, if ever, covers adult hormone replacement therapy, particularly if the goal is to achieve optimal wellness instead of dealing with a critical illness. Over the years, we have found insurance companies to be so frustrating and time-consuming, with so little results, that we no longer accept insurance, You can file a claim directly with your insurance company and we will provide the supporting evidence for your diagnosis, but the likelihood of being reimbursed is small, unless you have had pituitary radiation,

suffered a severe head trauma, or have had another extremely debilitating condition.

What If I Can't Afford HGH?

Many people do not need growth hormone in order to see marked improvements from hormone replacement therapy. Testosterone replacement in men, and an aggressive program of bioidentical hormone management in women, can often achieve results similar to the ones you hoped to find with growth hormone.

Are There Side Effects?

Any medication, including aspirin and penicillin, has a risk of side effects and contraindications. One of the reasons for responsible medical supervision is to avoid these side effects. The most common complaint seen in patients taking growth hormone is swelling of the feet and hands during the first few weeks of treatment. Most side effects are easily remedied by decreasing the dose of growth hormone and slowing the titration schedule.

How Old Are Your Clients?

Our patients are of all ages. Because hormone deficiency is commonly seen in men and women who have reached middle-age, most of our patients are in their 50s and 60s, although

some of our patients are well into in their 70s and 80s. We do not treat anyone under the age of 30, because bone platelets may not have completely fused and growth hormone is contraindicated.

Why Should I Choose Your Program?

We are one of the pioneers in hormone management and our physicians are recognized as the world's top experts in the fields. We are associated the American Academy of Anti-Aging, the Endocrine Society, the Age Management Medicine Group, and have an A+ rating with the Better Business Bureau.

What Makes Your Program Different?

We offer the most comprehensive program available. To begin with, we have pioneered the field of hormone management a decade ago. We adhere to a medical model in which you have a true personal relationship with your physician. And your physician is not working alone, but with the world's leading clinical experts in the regenerative, functional, anti-aging, and endocrine medicine.

These are the doctors who put their careers on the line long before anyone else had heard of hormone management, because they believed passionately in the power of hormones to change lives for the better. So we use topnotch science with thorough testing.

We will know more about you when we are done than your

primary care doctor does. If there is any question, for example, you have a cardiac condition and your insulin levels are unusually low, we work with a multidisciplinary team as consulting physicians.

We also work closely with your specialists because most of our clients have multiple issues, some related to hormones and some not. So we invest a lot of time and resources and expertise to make sure you have the best possible care. Not many so-called HGH clinics do that.

And we also take this one step further, providing a level of personal attention that makes getting well, well, a lot better. It's an exciting process for us and for you to see results. So this is fun medicine, the best kind of medicine there is. And we make coming here an enjoyable experience. We include a lot of services that other clinics don't. We will send a phlebotomist to your home or office to do your blood draw. And we don't pretend that a shot or two of hormones is going to turn your life around. Your body needs you to cooperate by making healthy lifestyle choices. That isn't always easy and we understand that. So we have a team of diet, nutrition, and fitness specialist here to help you. You have a personal wellness coach who is on your team, working with you. We give you all the possible tools. And we not only make this philosophy of wellness happen in one office, we make it happen nationwide.

CHAPTER 6

Clinical Research

“The effects of six months of human growth hormone on lean body mass and adipose-tissue were equivalent in magnitude to the changes incurred during 10-20 years of aging." Daniel Rudman, M.D. in the New England Journal of Medicine

"In older adults, increased HGH has resulted in significant improvements in muscle mass and endurance.” George R.
Merriman, MD, University of Washington, 2006

"If HGH was a "drug" it would be one of the safest and most effective we ever developed. Thousands of patients have been followed for the last 16 years.”
Pinchas Cohen, MD, UCLA, 2003

What Doctors Say

"HGH is the first anti-aging therapy proven by double placebo controlled studies." Ronald Klatz M.D., President and Founder, American Academy of Anti-Aging Medicine and author of "Grow Young with HGH – The Amazing Medically Proven Plan to Reverse Aging"

"It is possible that chronic physiologic GH and/or IGF-I replacement therapy might reverse (or prevent) some of these "Inevitable" sequences of aging" V.A. Medical Center and Department of Medicine, Stanford University Medical Center, March 1992 Study of GH Therapy In The Elderly

"Replacement therapy with Growth Hormone has shown beneficial/ normalizing effect on parameters such as cardiac and renal function, thyroid hormone metabolism, bone metabolism, sweat secretion, total fuel metabolism and psychological wellbeing." Jorgensen, MD and Christian, MD in 1994 issue of the European Journal of Endocrinology

"We really have something here which may be able to reverse some of the problems associated with aging." Anthony Karpos, M.D

"There is no evidence to suggest that Growth Hormone Replacement Therapy causes any unfavorable long term side

effects." Rosen, M.D. and G. Johannsson, M.D. in 1995 Research Study, the University Hospital Goteborg, Sweden

"All adults with growth hormone deficiency should now be considered for growth hormone replacement therapy." Joke Powrie, M.D. and Andrew Weissberger, MD, in 1995, St. Thomas Hospital, London England

"Daily administration of human growth hormone in the first week after trauma enhances the metabolic status, resulting in reduced morbidity and earlier discharge from hospital" in the May 1992 Journal of Surgery. Vol 11 1, 495-502, Ramias, MD, Shamos, MD, and Schiller, MD of St. Joseph Hospital Medical Center in Phoenix AZ

"Side effects of HGH therapy for adult deficiency are minor, dose- related, and totally reversible." New England Journal of Medicine, 1999

"Studies have demonstrated that adults with HGH deficiency are both physically and psychologically less healthy than their age-matched peers, and that HGH therapy results in substantial and sustained benefits." Scientific Committee of the Growth Hormone Research Society, 2001

"HGH therapy imparts great psychological, psychosocial and cardiovascular health benefits. The treatments add greatly to the quality of life and to maintaining a healthy lifestyle." Carol Ann Ryser, MD, Health Centers of America, 2002

"After 3 months of HGH, the subjects required less time to fall asleep and reported better quality sleep. Mood was improved as well." Division of Endocrinology, University of Erlangen-Nurnberg, 2003

"Our findings suggest that (HGH as a mitigating factor) endogenous testosterone, estrone and free IGF-1 levels may

play a protect role in the development of atherosclerosis (coronary heart disease) in aging men." Department of Internal Medicine, Erasmus University Medical Center, 2003

"We know HGH replacement therapy is a proven defense against frailty, and when added to lifestyle, this our chance to stay stronger and more functional." Ron Rothenberg, MD, California Healthspan Institute, Encinitas, California, 2009

"In older adults, increased HGH has resulted in significant improvements in muscle mass and endurance…" George R. Merriman, MD, University of Washington, 2006

"All the evidence shows that HGH is one of the safest drugs we have. Thousands of patients have been followed for the last 16 years." Pinchas Cohen, MD, UCLA, 2003

General Health

Hundreds of studies have shown HGH increases bone density and reduces the risk of osteoporosis; improves cardiac functioning and decreases the risk of heart attack and stroke; improves cholesterol by decreasing LDL cholesterol; and increases energy. It has also been shown to be useful in treating Crohn's disease. A few of these studies are noted below.

All adults with growth hormone deficiency should now be considered for growth hormone replacement therapy.

Dr. Jake Powrie, M.D. and Dr. Andrew Weissberger, St. Thomas Hospital, London, England, 1995 Replacement therapy with Growth Hormone has shown beneficial/normalizing effect on parameters such as cardiac and renal function, thyroid hormone metabolism, bone metabolism, sweat secretion, total and regional fuel metabolism and psychological wellbeing.

Dr. Jorgensen and Dr. Christian of Copenhagen, Denmark, in European Journal of Endocrinology, 1994

Increased Bone Density O'Halloran DJ, Tsatsoulis A, Whitehouse RW, Holmes SJ, Adams JE, Shalet SM.

Increased bone density after recombinant human growth hormone (GH) therapy in adults with isolated GH deficiency. J Clin Endocrinol Metab. 1993 May; 76(5):1344-8. PubMed PMID: 8496328. Finkenstedt G, Gasser RW, Höfle G, Watfah C, Fridrich L.

Effects of growth hormone (GH) replacement on bone

metabolism and mineral density in adult onset of GH deficiency: results of a double blind placebo-controlled study with open follow-up. Eur J Endocrinol. 1997 Mar;136(3):282-9. PubMed PMID: 9100553 Longobardi S, Di Rella F, Pivonello R, Di Somma C, Klain M, Maurelli L, Scarpa R, Colao A, Merola B, Lombardi G.
Effects of two years of growth hormone (GH) replacement therapy on bone metabolism and mineral density in childhood and adulthood onset GH deficient patients. J Endocrinol Invest. 1999 May; 22(5): 333-9. PubMed PMID: 10401706.
In conclusion, patients with childhood or adulthood onset GH deficiency have osteopenia that can be improved by long-term treatment with GH. Davidson P, Milne R, Chase D, Cooper C. Growth hormone replacement in adults and bone mineral density: a systematic review and meta-analysis. Clin Endocrinol (Oxf). 2004 Jan; 60(1):92-8. Review. PubMed PMID: 14678294. Elbornsson M, Götherström G, Franco C, Bengtsson BÅ, Johannsson G, Svensson J.
Effects of 3-year GH replacement therapy on bone mineral density in younger and elderly adults with adult-onset GH deficiency. Eur J Endocrinol. 2012 Feb;166(2):181-9. doi:10.1530/EJE-11-0886. Epub 2011 Nov 21. PubMed PMID: 22106341; PubMed Central PMCID: PMC3261573.
This study shows that GH replacement increases lumbar (L2-L4) spine and femur neck BMD and BMC in younger as well as elderly GHD patients. This supports the notion that long-term GH replacement is also useful in elderly GHD patients. Luigi Sacca, Antonio Cittadini, and Serration Fazio Growth Hormone and the Heart Endocrine Reviews October 1994 15: 555-573;
There is now solid evidence implicating GH and/or its local

effector insulin-like growth factor-I (IGF-I) in the intricate cascade of events connected with the regulation of heart development and hypertrophy (9–11). Lombardi G, Colao A, Ferone D, Marzullo P, Orio F,Longobardi S, Merola B. Effect of growth hormone on cardiac function. Horm Res. 1997;48 Suppl 4:38-42. Review. PubMed PMID: 9350445. Cardiac function is reported to improve during... GH replacement treatment. The evidence that GH can increase cardiac mass suggests its use in the treatment of idiopathic dilated cardiomyopathy. In a recent study on such patients, the administration of recombinant GH (rGH) was demonstrated to increase myocardial mass and reduce the size of the left ventricular chamber, resulting in improved hemodynamics, myocardial energy metabolism and clinical status. Lombardi G, Di Somma C, Marzullo P, Cerbone G, Colao Growth hormone and cardiac function. Ann Endocrinol (Paris). 2000 Feb;61(1):16-21. Review. PubMed PMID: 10790587

The evidence that GH is able to increase cardiac mass suggested its use in the treatment of chronic heart failure of diverse etiologies. GH administration was demonstrated to induce an improvement in hemodynamics and clinical status in some patients. Although these data should be confirmed in double-blind placebo controlled studies in larger series, the promising results open new perspectives for GH treatment in humans. Colao A, Marzullo P, Di Somma C, Lombardi G. Growth hormone and the heart. Clin Endocrinol (Oxf). 2001 Feb; 54(2):137-54. Review. PubMed PMID: 11207626. Colao A, Di Somma C, Vitale G, Filippella M, Lombardi G.

The Brain

HGH has important clinical benefits for the brain, including cognition and memory. It improves mood and outlook. It promotes longer, deeper, and more restful sleep. It also mitigates anxiety and depression.

McGauley, G.A. (Department of Medicine, United Medical and Dental Schools of Guy's and St Thomas's Hospitals, St Thomas's Hospital, London, UK). Quality of life assessment before and after growth hormone treatment in adults with growth hormone deficiency. Acta Paediatr Scand [Suppl] 356: 70, 1989.

Preliminary analysis of the results shows that after 6 months patients receiving human growth hormone (HGH) treatment experienced less perceived illness than the placebo group. Significant psychological improvement was noted in the HGH-treated patients' perception of their energy level and mood compared to the placebo group.

Psychological Wellbeing before and after Growth Hormone Treatment in Adults with Growth Hormone Deficiency

McGauley G.A. Cuneo R.C. · Salomon F. · Sönksen P.H.Horm Res 1990;33:52–54 (DOI: 10.1159/000181584)

Growth Hormone Deficiency and Quality of Life

McGauley G. Cuneo R. Salomon F. Sönksen P.H. Horm Res 1996;45:34–37 (DOI: 10.1159/000184756)

The majority of studies investigating the effects of growth hormone replacement therapy indicate that quality of life improves with treatment, although this is not a consistent finding.

Clinical Trials Underway As Of 2009 on GH and Cerebral Metabolism, Stanford U. and Genentech

Summary of Benefits of GH on Cognition

Baker LD, Barsness SM, Borson S, Merriam GR, Friedman SD, Craft S, Vitiello

MV. Effects of growth hormone–releasing hormone on cognitive function in adults with mild cognitive impairment and healthy older adults: results of a controlled trial. Arch Neurol. 2012 Nov;69(11): 1420-9. PubMed PMID: 22869065; PubMed Central

PMCID: PMC3764914.

Effects of growth hormone replacement on cognition after traumatic brain injury Neurotrauma. 2010 September; 27(9): 1565–1575. doi: 10.1089/neu.2009.1253 PMCID: PMC2966848

For many years, investigators have assumed that all of the cognitive impairments in executive functioning, information-processing speed, and memory, were due solely to diffuse axonal injury and structural focal injuries to the frontal and temporal lobes. The findings from this study and from other recent studies indicate that in a significant proportion of persons with moderate to severe TBI, some of the observed cognitive impairments may actually be the result of GH deficiency, and could potentially be partially reversible with GH replacement therapy. Furthermore, there is the intriguing possibility that the effects of GH replacement may be partially

use-dependent, raising the possibility that the effects of GH replacement may be maximized in the context of vigorous rehabilitation.

GHRH Improves Cognition In Healthy Older Adults; Neurobiology of Aging, Vol 27, Issue 2, Feb 2006, Department of Psychiatry and Behavioral Sciences, BB-1520D Health Science Building, University of Washington, Box 356560, 1959 NE Pacific Street, Seattle, WA 98195-6560, USA

Growth hormone and memory, Journal Endocrinology, August 9 2010 Wass, A.H. and Reddy, Raghava

The recent paper on 'early onset GH deficiency (GHD) results in spatial memory impairment in midlife – and is prevented by GH supplementation' Nieves-Martinez importantly adds to this literature. Other data suggest that GH beneficially affects cognitive function in rats. In man, treatment of GHD has been associated with improvements in measures of memory and attention. There are also differences in verbal memory of patients with childhood onset GHD. Further questions remain, and the beneficial effects or otherwise of treating GHD in different age groups remain to be better defined. Certainly for reasons of maturation of neural connections and their development to young adulthood contemporaneous with rises in GH and IGF1 make these important areas for further study in man. Lastly because of what we already know in terms of cognitive effects of GHD, it is important to replace GH when studying other potential causes of adverse effects on cognition, for example, with radiotherapy.

Weight Loss

The benefits of HGH increasing lean muscle mass while also promoting the rapid loss of adipose fat. It has been shown to increase the efficiency of the metabolism, resulting in a “fat burning” effect. It does not replace a sound diet but it maximizes the benefits of one.

Numerous studies have documented the metabolic effects of IGF1 as mediated by growth hormone. A 2013 review of 23 clinical studies (see below) concluded that growth hormone had benefits for body composition and lipid profiles, with no adverse effects.

Treatment with biosynthetic GH has been shown to improve the body composition and the metabolic efficacy of lean body mass in obese patients undergoing therapeutic severe caloric restriction. GH and conceivably Growth Hormone Releasing Peptides might therefore have a place in the therapy of obesity.

University of Milan, IRCCS Ospedale San Luca, Istituto Auxologico Italiano, Italy. International Journal of Obesity and Related Metabolic Disorders : Journal of the International Association for the Study of Obesity [1999, 23(3): 260-271]

Our findings indicate that baseline and 24 months, IGF1 and its degree of increase during GH replacement were more important than stimulated peak GH to predict the phenotypic response.

2013 Study of benefits (weight, BM1, cholesterol) Feldt-

Rasmussen U, Brabant G, Maiter D, Jonsson B, Toogood A, Koltowska-Haggstrom M, Rasmussen AK, Buchfelder M, Saller B, Biller BM Department of Medical Endocrinology, PE 2132, Rigshospitalet, National University Hospital, Copenhagen University, Copenhagen, Denmark.

We included 23 prospective studies with a rhGH treatment duration ranging from 5 to 15 years. Overall, beneficial effects were reported on QoL, body composition, lipid profile, carotid intima media thickness and bone mineral density. In contrast, the prevalence of the metabolic syndrome, glucose levels, BMI and muscle strength were not, or negatively, influenced.

2013- Summary of Research Appelman-Dijkstra NM, Claessen KM, Roelfsema F, Pereira AM, Biermasz NR Department of Endocrinology and Metabolic Diseases C4-R and Center for Endocrine Tumors, Leiden University Medical Center, P. O. Box 9600, 2300 RC Leiden, The Netherlands. European Journal of Endocrinology / European Federation of Endocrine Societies [2013,

169(1): R1-14]

Wallymahmed ME, Foy P, Shaw D, Hutcheon R, Edwards RH, MacFarlane IA. 1997

Quality of life, body composition and muscle strength in adult growth hormone deficiency: the influence of growth hormone replacement therapy for up to 3 years. Clin Endocrinol (Oxf). 47: 439–446

Anti-Aging

HGH is best known for its effects upon symptoms associated with aging. It increases energy and endurance. It also increases libido and sexual performance. It has strong cell regenerative powers, which reverse the signs of skin aging and promote hair regrowth. In study after study, growth hormone therapy (HGH therapy) has been shown to reverse the clinical signs of aging. HGH injections appear able to reverse 10 years of aging with one year of treatment. Dr. James Howenstine in A Physician's Guide to Natural Health Products that Work.

It is possible that chronic physiologic GH and/or IGF-I replacement therapy might reverse (or prevent) some of these "inevitable" sequelae of aging. V.A. Medical Center and Department of Medicine, Stanford University Medical Center, March 1992

A 2002 study on the effect of long-term untreated growth hormone deficiency (GHD) and 9 years of GH replacement on the quality of life (QoL) of GH-deficient adults concluded that patients with declining HGH experienced significant declines in health over a nine year period. In contrast, those who received HGH experienced improvements in energy and other benefits. These studies have led to the identification of a characteristic syndrome of GHD consisting of decreased mood and well-being, with alterations in body composition and substrate metabolism. In both placebo-controlled and open studies, GH replacement therapy has consistently been shown to reverse or correct these features. Carroll PV, Christ ER,

Sönksen PH. Growth hormone replacement in adults with growth hormone deficiency: assessment of current knowledge. Trends Endocrinol Metab. 2000 Aug;11(6):231-8. Review. PubMed PMID: 10878754. A 2008 Review Summarized Research Into HGH And Aging.

Article (Reprint)

LOW T AND GROWTH HORMONE

BY ALEXANDER W. LASTUSZAK, MD, A RESIDENT PHYSICIAN AT BAYLOR COLLEGE OF MEDICINE

Often when you hear the words “Growth Hormone,” it brings up images of bodybuilders, and frequently the use of growth hormone (GH) outside of medicine is focused on increasing lean body mass and decreasing fat mass, much the same as the use of testosterone outside of its normal clinical applications. However, GH remains an essential hormone in our body’s milieu, and without it, not only do people grow slowly, they can have difficulties with maintaining lean body mass, can develop low bone mineral density, which increases the risk for fractures, and can have heart problems, which can increase the risk of death 2-fold in GH-deficient individuals. People with low GH can also have low energy, poor concentration, memory loss, increased fat mass, and changes in cholesterol that may increase the risk of heart disease. Take note that many of these symptoms are the same as those associated with low testosterone, and studies have shown that testosterone and GH are linked; decreases in testosterone result in decreases in GH, and vice versa.

So how can we tell which hormone does what, and to what extent? Besides the obvious differences in blood hormone levels, the best way to determine what these hormones do

would be to compare their effects in a side-by-side manner. However, there are very few studies directly comparing the results of supplementation of GH together with testosterone, and these studies have focused mainly on changes in lean body mass and fat mass and have looked mainly at an older population. When looking at the results of all of these studies together, GH has a more dramatic effect on increasing lean body mass and decreasing fat mass than testosterone.

In addition to increases in lean body mass and decreases in fat mass, GH also has numerous other beneficial effects on the body, when used as a treatment for GH deficiency. These include decreases in total cholesterol and LDL cholesterol (the "bad" cholesterol), apolipoprotein B (ApoB) and C- reactive protein (CRP). All of these are markers for increased cardiovascular disease risk, and lower levels of these markers suggest a decreased risk of disease. Improvements in heart function as a result of GH administration have also been demonstrated in GH-deficient individuals, and may decrease the risk of death from heart disease in this population. Also, GH administration results in improvements in bone mineral density.

Despite these beneficial effects, GH has also been shown to increase fasting insulin and glucose levels, potentially increasing the risk for diabetes in individuals taking GH. Several studies have also shown an increase in hemoglobin A1C as a result of giving GH, which is an early measure of glucose control, an increase that suggests poor glucose control and increased risk for diabetes. However, no cases of diabetes have been linked directly to GH supplementation, so the jury remains out on this.

What all of this means is that giving GH to deficient individuals improves heart function and may decrease the risk of cardiovascular disease. Though GH may increase the risk of diabetes, this ultimately needs to be further studied. In addition, since all of the above results were obtained from a GH-deficient population, the same conclusions are unlikely to apply to those who use GH for bodybuilding purposes. As a result, it's difficult to comment on how safe and effective GH is in the athletic setting.

What about testosterone? We know a lot about the effects of testosterone, as it's gotten quite a bit of airtime in this blog (see "More important info on low testosterone, "Testosterone – Which Form is Right For You?") and elsewhere of late, but testosterone has many of the same effects as GH does, from improvements in lean body mass, fat mass, and bone mineral density, to potentially beneficial effects on cardiovascular status, data that conflict with prior data indicating that testosterone supplementation increases the risk of cardiovascular disease.

If the symptoms of GH and testosterone deficiency are similar, how do we know whom to give which hormone to and when? Your doctor will perform blood tests to check your testosterone and GH levels. If we find that your testosterone level is below a certain cutoff and that you have symptoms of testosterone deficiency (see "Testosterone – Which Form is Right For You?"), treatment will likely be started. For GH, blood levels of Insulin-like Growth Factor 1 (IGF-1), a surrogate blood marker for GH, are measured.

If you have blood levels of IGF-1 lower than a certain value, further evaluation for GH deficiency is usually pursued to

confirm that your body doesn't make enough GH, and if this is the case, then treatment with GmHay be started. However, while testosterone deficiency, which affects approximately 40% of all men, appears to be much more common than GH deficiency (1/10,000 individuals), not everyone tests for GH deficiency in the setting of the above symptoms. While I'm not saying that testing for GH deficiency in men with the symptoms described above is necessary, it's something that we should keep in the backs of our minds, and ultimately, we need to study the relationship between testosterone and GH in more depth.

The take home message here is that both testosterone and GH deficiency share a common set of symptoms and negative effects on the body, and the two hormones are linked together in how they are regulated by your body. Therefore, if your doctor looks for low levels of one, he or she should consider assessing the other as well, since replacement of either hormone has clear beneficial effects on the body in at least the short term.

CHAPTER 7

Product Information

Chinese and discontinued brands are sometimes sold as the real thing, when in fact they are illegal. HGH must be prescribed by a U.S. doctor and only FDA-approved products can be used. If a doctor fails to do proper testing and to prescribe authentic products, there is the real risk of losing one's medical license.

We take this very seriously. Our doctors have invested an average of 20 years in the field of hormone management and wellness. They are board certified. They have achieved professional standing as the leading authorities on hormone replacement therapy in adults. So they will not prescribe growth hormone, or any other hormone, unless you can benefit from hormone replacement.

We prescribe only FDA-approved growth hormone drugs, which you can have filled at your pharmacy or for slightly less through us.

SECTION 1

FDA-Approved HGH

Zorbtive

Zorbtive is a somatropin produced by EMD Serono, the makers of Saizen and Serostim, which was approved by the FDA in 2003. It is marketed primarily to people with Short Bowel Syndrome. It is the 191 acid form of growth hormone and is sold in 8.8 mg vials. The patent on the drug expires in 2016. EMD Serono is part of Merck Company, NY. The German pharmaceuticals giant. Merck is unrelated to the New York Merck, which was expatriated in World War I (1917). The patent on Zorbtive was issued in 1999 and expires in 2016. Zorbtive is identical to the product Serostim, also produced by Serono.

Saizen

The manufacturer of Saizen is EMD Serono, Inc., Saizen was originally approved by the FDA in 1987. Saizen is now including marketing information aimed at adults with growth hormone deficiency. The "easypod" is an electronic device designed for preset dosing, and has a calendar to keep you on schedule, but is not needle-free. Serono also makes the "CoolQuick" needle-free injection device, which is operated with a battery.

Please note that Saizen produced for the Mexican market is frequently counterfeited and fake. A lot of bodybuilders are under the impression that if their black market growth

hormone does not test positive, it is not HGH and therefore not fake. Not testing positive means that it is not HGH.

Omnitrope

Omnitrope is an FDA-approved growth hormone sold in both pens and vials. The pens are designed for pediatric use and are convenient for daily injections. It is a biologic made by Sandoz, a subsidiary of Novis, which is headquartered in Switzerland. Omnitrope faced opposition from the FDA in 2004 when it sought approval, but the FDA could come up with no good reason for delaying approval of the drug. It is a bioidentical recombinant somatropin, made in the same way as other approved brands. The Omnitrope cartridge pen was approved in 2008. It has a liquid cartridge and comes in a 10 mg strength, which allows it to go beyond pediatric growth hormone deficiencies. In this Sandoz is like the other somatropin manufacturers, who are beginning to adjust their packaging to reflect adult needs.

Tev-Tropin

Tev-Tropin is FDA-approved somatropin (rDNA origin) manufactured by Teva Pharmaceuticals. The T-Jet device is offered as a delivery device that is easier for pediatric patients, a pen which provides the injections without a needle. It is also offered as dry powder vial, which needs to be reconstituted with the diluent in the kit. Syringes are bought separately, unless you use the T-Jet device. It must be stored in the refrigerator at all times and the solution is stable for up to 14 days. Teva Pharmaceuticals is the largest generic manufacturer in the world and is headquartered in Israel. It

has manufacturing facilities in North America, South America, Europe, and Israel. It began marketing somatropin in 2005 in the U.S. and its needle-free injection device was approved in 2009.

Serostim

Serostim is a somatropin RDNA origin that is marketed to AIDS patients to prevent wasting (muscle loss). It is made by EMD Serono, which also makes Saizen and Zorbtive (somatropins) and Egrifta (tesamorelin). It is widely counterfeited and sold through Canadian online pharmacies. It was approved in 1996 to treat AIDS patients. In 2001, there was a scandal in which a whistleblower charged Serano was faking test results to increase sales. Serono agreed to settle the case for $24 million in 2007. Muscle wasting is much less of a problem today in AIDS patients due to newer treatments. It is marketed as Serostim and Serostim LQ but keeps a low profile.

Norditropin

Norditropin makes several different growth hormone products, which differ in the delivery system. The cartridge and Nordiflex are about the same price and the Flexpro is more. Norditropin is made by Novo Nordisk, a Danish company. It was approved by the FDA in 1997 to treat growth failure in children.

Nutropin AQ

Nutropin is made by Genentech, Inc., one of the original synthesizers of recombinant DNA growth hormone. Nutropin

is the 191 amino acid sequence that is virtually indistinguishable from the growth hormone produced by your body.

Genotropin

Genotropin is sold as a powder vial and as a cartridge. It is made by the Pharmacia and Upjohn Company (Pfizer) for the treatment of pediatric growth disorders. It was approved by the FDA originally in 1995 and was approved again in 2001 to treat children who were born small for gestational age (SGA) and again in 2010 to treat chronic gout.

Humatrope

Humatrope is a manmade form of human growth hormone and was first approved in 1987 to treat children who are growing slowly because they do not make enough growth hormone on their own. Since that time, Humatrope has also been approved for the treatment of several additional growth disorders (idiopathic short stature, Turner syndrome, small for gestational age, SHOX deficiency) and for growth hormone deficiency in adults. Humatrope is available in cartridges for use in a HumatroPen® injection device and in vials for use with a syringe and needle.

Manufactured by Lilly USA, available in vial form and as the HumatroPen® 6 mg, 12 mg, and 24 mg.

Humatrope must be kept refrigerated (36° to 46°F [2° to 8°C]) before and after it is mixed.

Source: FDA Orange Book of Approved Drug Products, 2013

SECTION 2

Illegal HGH

DISCONTINUED PRODUCTS

Ascellacrin

Serono made this. It was the original form of human derived pituitary growth hormone that has been discontinued since 1985.

Crescormon

Genentech made this product. It was human derived pituitary growth hormone and has been discontinued since 1985.

Accretropin

Cangene makes this drug, which was granted approval by the FDA. It is a 192 form of growth hormone and was withdrawn from the market by the manufacturer. The 192 amino acid form has been associated with more side effects and less efficacy than the 191 amino acid bioidentical form of the drug.

Bio-Tropin

Bio-Tropin was made by Ferring Pharmaceuticals, an Israeli company, but produced in Germany. The active ingredient is somatropine, which is a recombinant somatropin but designed to have a longer half-life. It was originally approved in 1995. It is no longer available, but Tev-Tropin is. It is

similar to other brands, such as Genotonorm (made in Spain), Gentonorm (made in Luxembourg), Growtropin (made in Peru), HHT (made in Mexico and South America), Hai Shi Yuan (made in China), and Growject (made in Japan)

Protropin

Protropin is a 192 amino acid somatrem and has been discontinued. It was made by Genentech and was withdrawn in 2006.

Chinese/Mexican Products Cryptotropin

This is a Mexican brand of growth hormone made by Laboratorios
Cyropharma. No reviews of it available. But it doesn't come in a standard measurement (5 mg). Vials are not vacuum sealed nor they under a pressure seal. The powder doesn't dissolve well, according to some reports.

Riptropin

A relabeled product made by an unknown Chinese lab, it is probably a somatrem (192 amino acid sequence) instead of the 191 amino acid form (somatropin) and it is not bioidentical, causing autoimmune responses that can include the body developing an immunity against its own natural growth hormone. Riptropin has had reports of painful injection sites, a result of bacterial contamination.

Kigtropin

This is a relabeled Chinese product made by an unknown Chinese company. It is thought to be 192 amino acid HGH falsely labeled as 191 amino acid HGH. The 192 acid form was

dropped by U.S. manufacturers because it was rejected by the human body and caused autoimmune reactions that could include the rejecting its own, naturally produced HGH. Kigtropin has had reports of swollen injection sites, which indicates bacterial residue and impurities. It has been available on the market since 2011.

JTPN

JTPN is Jintropin made for the Mexican market. It is manufactured by the same company, GeneScience, in China. There have been reports that Mexican pharmacies are relabeling generic HGH from unknown Chinese companies as JTPN, and that these products are tainted.

Hypertropin

This brand of Chinese somatotropin is made by NeoGenica Bio- Science. It is one of the more common black market brands sold to people who don't mind risking their health and safety in order to save some money. The company started in 2004 mainly to produce IGF-1 but later added growth hormone. It was part of GenSci (Jintropin) originally.

Geotropic

This generic somatropin was packaged for the black market using an unknown Chinese brand and sold mainly in the U.K. It is thought to be the 192 amino acid chain (instead of the correct 191) and was plagued by complaints about impurities and bacterial residue. It has since been renamed “Riptropin"

Neotropin

Neotropin is made by Neo Labs, which was founded in 2007

in China. It began producing growth hormone in 2009 and produces a variety of related drugs, including GHRP-2 and growth hormone releasing peptide 6. It specifically markets to the bodybuilding community, and speaks openly in product literature about building muscle, which would not be allowed from an FDA approved company. Neo Labs (Neo Laboratories) is actually a Russian company which entered into a contract with a pharmaceutical company in China to make its product. Very little is known about Neo Labs, but it is sold online via Russian pharmacies.

Ansomone

Ansomone is made by AnkeBio in China. It is not a legal form of somatropin. It used to be 192 amino acid sequence (somatrem) but is now a 191 amino acid (somatropin) form of the drug. Between the years 2005 to 2007 Ansomone was widely available on the black market.

Following a US FDA sting on Chinese drug makers, many growth hormone companies temporarily shut down (Jintropin among them). Ansomone is widely counterfeited and most of the available products are thought to be fake.

Hygetropin

This is a 191 amino acid chain form of HGH that has had many complaints about impurities and contaminants from black market users. It came on the market in 2008 when Jintropin was temporarily shut down, but is no longer available.

SECTION 3

Related HGH Hormones

LH

Luteinizing hormone (LH, lutropin, lutrophin) is produced in the pituitary gland. It simulates production of testosterone in males and estrogen in females. This hormone is primarily related to reproduction. It belongs to the class of hormones known as gonadotropins

There are two forms of pharmaceutical LH. One is produced from human urine and the other is produced using recombinant DNA technology. Men use synthetic LH to increase testosterone levels, with the same effect as anabolic steroids. LH does not increase muscle mass in women. LH and growth hormone are related because both are released in accordance with pulses of leptin. HCG (human chorionic gonadotropin) is sometimes used in women as a fertility drug because it activates the same receptors as LH but is less costly and has a longer half-life. Again, men sometimes use HCG in order to increase testosterone levels and build muscle, but it does not have a muscle building effect in women. LH is available by prescription only and is used by injection. There is no oral or topical form.

There are many varieties of female infertility drugs, but these are two of the most popular: Pergonal IM - LF with FSH made by Ares-Serono Luveris - made by Merck Serono recombinant DNA LF (lutropin alfa)

DHEA

DHEA is a hormone produced by the adrenal glands. It is a precursor hormone that is converted into testosterone in males and estrogen in females. It can help strengthen the adrenal glands in the event of adrenal fatigue, and it is very helpful in treating the symptoms of menopause. It has also been useful in treating depression and may be able to reverse arterial plaque due to cholesterol. The National Institutes of Health reports that currently there is evidence to support supplementation with DHEA for schizophrenia, improving the skin appearance of elderly men and women, helping with erectile dysfunction, improving symptoms of certain autoimmune diseases and increasing bone density. The Mayo Clinic recommends caution because it can cause elevated estrogens or androgens (testosterone) in the body. The FDA banned DHEA in 1985 but the ban was removed. It is illegal in many sports in any form, because in men can release androgens that build muscle. There are two types of DHEA: prescription DHEA (injections) and over-the-counter products supplements and herbal preparations. Topical preparations such as creams are marketed with up to 10% DHEA. Preliminary research shows that DHEA may be useful in this form as an anti-aging agent for the skin. DHEA extracts are supplements are made from wild yams or soy and cannot be absorbed or used by the body effectively.

These products contain diosgenin, which is meant to be transformed by the body into DHEA, but this cannot happen. The body does not recognize plant-based diosgenin. Yams and soy can be converted in the lab into synthetic DHEA which works in the body, but is not a bioidentical hormone. A

synthetic form, 7-keto is a DHEA metabolite that is sold as a weight loss product. It does not convert to DHEA or raise DHEA blood levels, but it may increase T-3 thyroid hormone in obese patients and help people lose weight.

Increlex (IGF1)

Increlex (recombinant DNA mercaserim) is the only FDA-approved brand of IGF1. It is made by Ipsen Biopharmaceuticals for the treatment of IGF1 deficiency in children. It is not considered a replacement for growth hormone and carries a high risk of becoming hypoglycemic. It is sold as an injectable and must be refrigerated at all times. Increlex is very expensive, around $8000-$9000 a month. There are of course Chinese companies who are making black market products, but these are used mainly by the bodybuilding community.

Iplex (mercaserim rinfabate)

This is no longer available in the U.S. This was a combination of recombinant IGF1 with recombinant binding protein-3. Iplex is being developed by another company as a treatment for retina disorder in premature babies. Counterfeit brands of Increlex are being sold through Mexican pharmacies with the wrong packaging (blue) instead of green.

FSH

FSH (follicle stimulating hormone) is a sex hormone produced by the pituitary, which together with luteinizing hormone, is responsible for fertility. Blood levels of FSH help to diagnose menopause in women and infertility in men. It can also be

associated with a malfunction of the pituitary gland, which would also mean lower than normal growth hormone production.

Clomiphene (clomiphene citrate)

This stimulates the pituitary to produce more FSH and LH, which stimulates the development of ovaries to produce. It was developed as a female fertility drug that has been abused by bodybuilders. The bodybuilders use it to inhibit the effects of estrogen, thus bypassing the negative feedback loop and increasing their LH, so that more testosterone is released. Clomiphene has also been used to augment testosterone replacement therapy, sometimes instead of testosterone replacement, to boost natural production of testosterone. It is fairly effective compared to topical testosterone, but not close to the results of testosterone injections. Brand names of clomiphene include Clomid, Milophene, and Serophene.

HCG

HCG (human chorionic gonadotropin) is a hormone found in the urine of pregnant women. It has been touted as a weight loss aid and is sold over the counter as homeopathic liquid for sublingual administration (under the tongue) and in prescription form as an injectable. The weight loss achieved on the "HCG diet" is staggering, but it is due to a plan that restricts dieters to 500 calories per day. Ads for the product say that if you follow the plan for 45 days, you will lose several pounds a day and "fix your metabolism." HCG is supposed to suppress your appetite and speed up your metabolism. There is no scientific evidence that it does either. A 2009 position

paper sponsored by the American Society of Bariatric Physicians concluded that HCG is not effective as a weight-loss aid and is not recommended. Furthermore, most nutritionists recommend a diet plan will allow calories of about 1200- 1500 for a woman, and more for a man. Very low caloric consumption triggers the body to go into starvation mode, so that you lose muscle as well as fat, and when the weight inevitably returns, it returns as fat.

The FDA and the FTC issued warning letters in 2011 to 7 companies that were marketing over-the-counter "homeopathic" HCG for weight loss, stating there were making unsupported claims for their products. HCG is used by bodybuilders to prevent testicular atrophy, resulting, from mega amounts of testosterone and to mask the presence of illegal anabolic steroids.

SECTION 4

Rx HGH Peptides

GHRH

Product Description GHRH (human growth hormone releasing hormone) is a 44-amino acid sequence that is produced in the hypothalamus of the brain. It is responsible for stimulating the production of growth hormone by the pituitary. Synthetic growth hormone releasing hormone contains 29-amino acids, so it is not bioidentical. It is a peptide secretagogue.

See Sermorelin and Termolein for more information on pharmaceutical GHRH. Related names include somatocrinin, somaorelin, GHRF, and MGC19781.

Genaxxon (Germany) produces and ships peptide hormones for research purposes, including GHRP-6 ($450 for 100 mg), which is a chain of 6 amino acids of growth hormone releasing hormone.

Sermorelin

Sermorelin Acetate (GRF1-29 NH2) is contains 29 amino acids out of the 44 in naturally produced growth hormone releasing hormone (GHRH). Sermorelin is not a hormone, but the active amino acid sequence in GHRH. It is an amino acid secretagogue, but it is intended to mimic the action of GHRH. It is available by prescription only.

It is not bioidentical but the amino acids it contains also occur in the body. Sermorelin has been shown to be effective in stimulating the pituitary to produce growth hormone. It comes as a lyophilized powder with bacteriostatic water, the same as injectable growth hormone. The Sermorelin is mixed with the water and injected into the body fat, usually before bedtime. It takes about 3-6 months for its full effects to be noticed. Like growth hormone, it is injected daily, but unlike growth hormone, once optimal GH levels are achieved, you can switch a less frequent dosing schedule. Real Sermorelin is not sold in a premixed liquid form, sublingual form, or oral tablet form. Currently (09-2013) there are no brands of FDA-approved Sermorelin on the market. It can be provided by a compounding pharmacy. Online websites that have it for sale state "not for human consumption" Geref (Sermorelin Acetate) by EMD Serono – discontinued. Compounding Pharmacies (Franck's Lab, NuVision, Beacon Hill/Rxtra issued recalls in 2012- 2013) CJC-1293 and CJC-1295 are research drugs Tesamorelin

Tesamorelin is a growth hormone releasing factor (GHRF). The brand name is Egrifta, made by EMD Serono, which also makes growth hormone. It is a powder that is mixed in a solution and injected.

Compounded forms are made in Canada by Theratechnologies, but are not legal for sale in the U.S. It is sold as a research drug on the black market.

MK-677

MK-677 (Ibutamoren, L-163, 191) is a research drug made by Merck Laboratories that acts as an orally active growth

hormone secretagogue. It is able to stimulate growth hormone release without affecting cortisol. It belongs to a group of oral secretagogues, which consist of amino acid peptides, the building blocks of hormones such as growth hormone. Ghrelin, one of these amino peptides, has been found to stimulate the production of growth hormone. Currently under development, MK-677 claims to mimic the effects of ghrelin and other natural secretagogues found in the body. MK-677 as a growth hormone secretagogue is based on the assumption that oral secretagogues can interact directly with growth hormone receptors without being tamped down by somatostatin, which inhibits the release of growth hormone. A study of 65 people aged 65 to 81 found that Mk-677 produced some effects similar to growth hormone, but that body fat actually increased and like ghrelin it also stimulated an increase in appetite which persisted for several months. MK-677 is thought to be of value primarily to older people who cannot afford GH replacement therapy and who need to gain some weight. MK-677 is not legally available for human consumption. Online sellers frequently charge $150 per gram, but there is no way to determine if in fact you have a substance similar to MK-677 without having your purchase analyzed by a lab.

SECTION 5

HGH Oral Peptide Secretagogues

Arginine

Arginine is an amino acid made by the body. It is found in foods that have protein. It is the chemical precursor to nitric oxide, which is a vasodilator. Evidence suggests that arginine can help with circulation, erectile dysfunction, vascular headaches, and clogged arteries.

Arginine triggers the body to make protein and reduces muscle wasting. In injection form, arginine is used in stimulation tests to measure growth hormone output. It inhibits the release of somatostatin, and when injected with growth hormone releasing hormone is linked to a significant rise in growth hormone (GHRH). GHRH stimulates the release of growth hormone, and arginine keeps somatostatin from blocking growth hormone output. The combination of GHRH and arginine together is more effective than either alone.

In oral form, arginine can cause growth hormone to increase significantly in doses of 5 g to 9 g. The rise in growth hormone started 30 minutes after ingestion and peaked 30 minutes later. Above 9 g, arginine caused diarrhea without much increase in growth hormone. Arginine is usually taken with ornithine. Tolvaptan is the prescription form of arginine and

is used to increase sodium levels in the blood of people with heart failure. It causes the body to release more water into the urine, so that sodium concentration rises. Too much can be fatal.

Glutamine

Glutamine is used to treat nerve pain (neuropathy), ulcers and Crohn's disease, anxiety, moodiness, and insomnia. It is also used to prevent muscle-wasting and to boost the immune system. Glutamine is the most prevalent free (unbound) amino acid in the body and is produced by the muscles to be distributed in the blood where needed. It plays an important part in metabolism and is needed to convert glucose into energy (nitrogen plus carbon). Nitrogen produced by glutamine helps repair muscle damage, and if the body uses more glutamine than it can make muscle wasting occur, such as is seen in AIDS patients. It is used to prevent muscle damage and wasting associated with chemotherapy.

Glutamine is thought to support the body's immune system by fueling white blood cells, and in combination with cysteine and glycine, helps the body produce the antioxidant glutathione.

In a study published in the American Journal of Clinical Nutrition, 2 grams of oral glutamine increased blood levels of growth hormone. In another study, subjects who injected a combination of glutamine, glycine, and niacin for 3 weeks showed a 70% increase in serum growth hormone levels.

Lysine

L-lysine is thought to prevent shingles and cold sores. In a 1981 study of 15 men, oral supplements of lysine (1200 mg) and arginine (1200 gm) provoked a release of growth hormone plus insulin. But neither lysine nor arginine alone provoked an increase in growth hormone.

These results have been borne out by subsequent studies, which found growth hormone peaked after ingestion at up to 8x the baseline level. This effect was noticed at rest, not with exercise. The reason is that exercise alone is a powerful growth hormone releaser, and amino acids do not do much to boost it. Like the other amino acids, it is found in protein foods.

Ornithine

L-ornithine is an amino acid produced by the body from l-arginine. It aids the body in recovery and hospital patients recovering from major surgery or trauma are usually deficient in it. It inhibits cortisone, which breaks down muscle, and encourages the body to synthesize protein into muscle. It has also been found to help people who have cirrhosis of the liver. Intravenous administration is associated with significant growth hormone release, but ornithine can also have a positive effect when taken as an oral supplement. Bucci, et al, investigated the effects of oral ornithine on bodybuilders and found significant increases in growth hormone at 40 and 100 mg/kg. Subjects who took 170 mg/k showed a higher increase with up to 4x the base level, but high doses of ornithine caused diarrhea in the male subject (not the female ones). Ornithine is usually taken with arginine.

SECTION 6

Homeopathic HGH

HGH sprays claim that putting a little growth hormone in your system will stimulate your liver to produce IGF1, with an increase of up to 170%.

There are many different HGH sprays, but they all claim to work the same way with great results. Jerry Emanuelson, the author of the Life Extension Manual (available online only), sums it up best regarding HGH Sprays: Many products are currently being advertised as Oral HGH sprays.

I don't see how these products can possibly work. They don't contain enough HGH to have any biological effect, and all of the scientific evidence indicates that the HGH molecule is far too large to be absorbed through the membranes of the mouth. If HGH is swallowed, it is destroyed in the digestive tract before it can be absorbed into the blood stream.

The advertising for nearly all of the so- called "oral HGH sprays" is clearly fraudulent. Most people have received junk email advertising these products. I looked at the website referred to by one of these bulk email ads. The web site quotes data from a report on injectable HGH, a completely unrelated product. The website quotes data on oral absorption from the Physician's Desk Reference, but if you look at that page of the referenced edition of the Physician's Desk Reference, you see that the absorption data is for a completely unrelated

multivitamin product made by another company.

Many "oral HGH" products advertise their HGH levels in nanograms. Keep in mind that the average daily injectable dose of HGH (one unit) is 333, 333 nanograms, whereas the advertised amount of HGH in "oral HGH sprays" is 600 to 2000 nanograms per day. Also, without refrigeration, more than 90 percent of the HGH in an ordinary liquid solution is lost every 24 hours.

SECTION 7

HGH Supplements

Pituitary Extract

Pituitary extract is bovine pituitary extract. Human-derived pituitary extract is no longer produced and has not been since 1985.
Nonetheless, it is sold in one form or the other as "high concentration of raw pituitary gland which is rich in biologically active proteins enzymes and polypeptide hormones necessary to assist with proper pituitary function." It sounds good, except than humans cannot absorb or use any peptides that do not mimic their own DNA. Bovine (cow) pituitary is foreign to the human body and excreted as a waste product.

Deer Antler Velvet

Deer antler velvet is sold primarily to athletes who want to recover more quickly from the muscle tears and tendon injuries associated with strenuous exercise. The theory is that the IGF-1 that comes from deer antler velvet will work to heal muscle and cartilage injuries.
While IGF-1 does play an important role in muscle recovery, the effective form of IGF-1 must be virtually indistinguishable from human- produced IGF-1 and it must be injected. Deer

antler velvet fails on both counts. It is not a form the human body can recognize or use. And sprays or sublingual or drops do not work, even if you spray 100% pure pharmaceutical IGF-1 all over yourself or drink a glass of it.

The World Anti-Doping Agency has removed it from its banned substances list, no doubt recognizing the stuff is useless. Now that it is no longer banned, the popularity of deer antler velvet should plummet rapidly. One such brand is SuperMax (200, 000 nanograms) of "IGF1".