The Straight Facts About Human Growth Hormone (hGH)

The bottom line is simply that pharmaceutical hgh given by injection is the only form that works. The hgh sprays, hgh supplements, and other hgh products like Ultimate HGH have not been proven to increase IGF1 levels.

What is Growth Hormone?

Human growth hormone (hGH) is a long chain amino acid molecule produced by the anterior pituitary gland, located at the base the brain. It is a large fragile protein molecule with a molecular weight of 20,000. HGH acts on many different tissues to promote healthy metabolism. The bulk of the effect accomplished by hGH is performed by a related hormone called Insulin-like Growth Factor-1 (IGF-1), which is released predominantly by the liver and, to some extent, by other tissues in response to the presence of hGH. It is one of the primary hormones of importance for maintaining optimal cellular performance.

What are the potential benefits of raising Human Growth Hormone levels?

Natural levels of hGH and IGF-1 decline progressively after young adulthood, leading to many of the bodily changes associated with aging. Raising hGH and IGF-1 levels to those associated with younger physiology slows down or delays the age related decline frequently seen in many organs.

Studies reliably demonstrate that the following are among the many beneficial effects of modulating hGH/IGF-1:

- Enhanced skin thickness and elasticity
- Improved healing time and reduced infection rates after trauma or surgery
- Diminished sun damage-type wrinkling
- Decreased total body fat
- Increased lean muscle mass
- Increased bone mineral density
- Improved cholesterol profile
- Decreased LDL (bad) cholesterol
- Increased HDL (good) cholesterol
- Improved exercise capacity
- Decreased recovery time between workouts
- Improved blood flow to the kidney
- Improved mood, coping skills, and over-all well-being
- Improved general energy levels

These effects do not occur over night, after the first several weeks of therapy, the first change that is typically noted is a feeling of enhanced well-being, with most of the compositional changes, such as fat loss or muscle or bone gain noted after 3 to 11 months of therapy.
What are acceptable methods of raising hGh/IGF-1 levels?

There are many companies that promote various pills, elixirs, sprays, or creams that are claimed to contain useful amounts of hGH; they claim that these products are actually taken up by the body through topical, oral, sublingual or nasal administration. One should be skeptical of such claims, as none of the published benefits of injected hGH have been objectively measured with oral tablets, capsules, or sprays.

It is important to understand that hGH is a very large polypeptide hormone--191 amino acids in exact sequence, maintained in a required three-dimensional shape. The only sources of safe and accurately assembled hGH are those that use recombinant DNA technology that requires elaborate, precise, and monitored methods. HGH, from any other source, even from other animals, simply does not work in humans. Similar animal molecules have been shown to be species-specific and unable to mimic the effect of the human molecule; and there is absolutely no naturally occurring plant source of hGH.

The Food and Drug Administration (FDA) licenses and oversees companies that manufacture hGH. They must register and verify their methods and product regarding uniformity of quality, bioavailability, safety, and demonstrated effectiveness. This large protein molecule is unable to penetrate intact membranes to any significant degree, making any spray or oral use of hGH almost completely a waste. The technology to make hGH is patented by large pharmaceutical companies and is restricted by law to their use. It is an expensive manufacturing process, making waste prohibitively expensive. HGH may only be administered via injection by prescription under the supervision of a licensed physician through a licensed clinic or pharmacy.

Given the above requirements, there are several concerns that arise regarding the claims made by non-FDA approved companies that offer hGH products in oral or spray forms:

1. As stated above there are only a few companies approved by the FDA to manufacture hGH. Because of the patent parameters, manufacturing hGH is complex and extremely expensive. Any claim that a product contains hGH would, by federal law, require its production be verified, overseen, and approved by the FDA to meet its standards for quality and content. This creates a double bind for the purveyors of these oral and other form "hGH" products, because if they do contain any significant amount of hGH, it would be illegal to provide it without a prescription, exact content disclosure, or origin of production. The fact that these products do not have to meet the accepted oversight and dispensing standards would indicate that they do not actually contain any significant amount of HGH.

2. Molecules as large as hGH cannot be absorbed into the body across skin or mucous membranes. Even insulin, a molecule only half the size of hGH, and of similar type and construction, cannot be absorbed in this manner. Given this limitation, hGH is digested, or broken down into simpler compounds if it is not injected. Any claim that it can be absorbed in the oral mucosa and then transported to the Pituitary Gland, is nonsense, as hGH has no beneficial effect at the pituitary gland. The pituitary gland is the normal source of hGH in young adults. The pituitary releases hGH into the circulation so that it can have its effects elsewhere. Any claim that stimulating dose works by being absorbed into the feedback system of the Pituitary Gland, is total nonsense, meant to deceive scientifi-cally unsophisticated consumers.

3. There are no published physiologic studies that show any appreciable improvement in systemic hGH/IGF-1 levels when delivered orally or by spray. If it were currently possible, the FDA approved pharmaceutical companies that manufacture hGH (and for that matter insulin) would dearly love to use delivery methods other than injection.
4. Given the expense involved in the manufacture of actual hGH, even if it were to be able to be administered orally or topically, the cost of delivering the proper dose of hGH would be equivalent to the current injection solutions, which have proven very high bioavailability and well-demonstrated correlation between dose and subsequent level.

5. HGH is a very fragile molecule; it is dependant upon the retention of a precise complete amino acid sequence and three-dimensional structure, with some parts of the molecule necessarily linked to others. It works on cell receptors exactly like a key in a lock, so, even if the chemical formula remains the same, any change in shape blocks hGH activity. The cross-linkages break very easily and become unstable soon after dissolving in solution. When refrigerated, biological activity may be maintained for up to two weeks before it loses its function.

6. Products that are shipped and stored at room temperature in uncontrolled or sub-optimal environments cannot retain any functional amount of hGH. [There are only 2 FDA-approved companies which manufacture injectable hGH which can be stored at room temperature for a defined period of time until mixing]

Considered as a whole, claims that over the counter or direct-marketed products contain or provide alternate forms of hGH are taking unwarranted advantage of consumer hopes, trust, and lack of medical knowledge. Using authentic claims about the benefits of human Growth Hormone which is injected, furthermore, is highly misleading, as that is not what they are selling.

What About Secretagogues or hGH Precursors?

In the realm of body hormones in general, there are two ways to attempt to augment the amount of a hormone in circulation. The first, as already mentioned, is to give it directly, through injection. The second is to try to stimulate the body in such a way as to increase the amount of hormone that is produced by the body itself, or to enhance the function of hormone that has already been produced. Regarding hGH there are several ways to attempt this:

1) Secretagogues. A secretagogue is a substance that stimulates the pituitary gland to produce hGH. This has been an intriguing avenue of research. Over the last twenty years, several short-chain, orally absorbable compounds have been investigated. Containing as few as three (commonly six to eight) amino acid molecules, some compounds have been shown to stimulate the production of significant amounts of hGH. Of the truly effective molecules, the pituitary gland was stimulated in a too broad manner, and levels of other hormones that are not desirable were also raised. Most unfortunately, the most common accompanying hormone rise was seen in cortisol levels. In a way, cortisol is the nemesis of hGH, antagonizing the beneficial effects of hGH action. These secondary hormonal changes have severely limited the general role secretagogues may play in hGH supplementation, and have stymied the ability of pharmaceutical research to develop useful compounds. To date, none have proven to be consistent enough in their actions or safety profile to warrant a specific product release.

Some claimed secretagogues are available in the over-the-counter market; these products are generally safe, but in general do not demonstrate a certain hGH response in every individual. They seem to have their greatest effectiveness in young (under age 35) and highly athletic people, and require high dose to generate a meaningful response.
The number of people who respond is typically around 35%, and in those who respond there is only a 10-30% increase in level. With advancing age there is a progressively smaller response rate and magnitude of response. Exceptions exist, and it is regarded as a safe category of compound to use in a trial, after a baseline hormone level is established and, after a three-month course of secretagogues, additional retesting of hormone levels is done. A total reevaluation should be made after no more than 6 months to determine effectiveness.

Only if there is objective as well as subjective improvement documented should use of the product be continued. Even an FDA approved injectable secretagogue is of limited value even in very young people. The secretagogue market brings to mind an important caveat regarding any medical or health directed program: The most important aspect of any medical/health undertaking is the open exchange of information; people should know precisely what they put into their bodies. Even patented drugs must disclose what they contain so appropriate decisions can be made regarding safety. Rule number one with secretagogues should be that any marketing company must tell the consumer exactly what he or she is ingesting.

2) HGH Precursors. The concept of hGH precursor use is that if the body is supplied with the constituent parts of hGH, then it may be more apt to decide to use that fortuitous blend of amino acids to more easily make hGH. (Most secretagogue products on the market would really be more accurately placed in this category.) This effect is seen, but, as above, is limited primarily to young athletic individuals. The most frequent outcome with this approach is no change in hGH level, but with no harm or undesirable hormonal changes. Very high doses may be required, necessitating a gentle approach in patients with decreased renal function, or who are on medications that require excretion by the kidney, especially aspirin related compounds. Response rates can be as low as 10%, with only a small actual rise in hGH levels. Again, response rates and amounts fall with age, and IGF-1 levels should be checked before beginning and after 5-6 weeks, to verify any response. If there is no change, then this intervention should be abandoned.

3) Anti-somatostatin Therapy. There is a concept of therapy that tries to identify compounds or hormones that antagonize the effect of hGH, and tries to foil them. This might be considered the medical equivalent of a double negative or "the enemy of my friend is my enemy". The body produces a hormone called somatostatin. This hormone is the antithesis of hGH. Therapeutic attempts have been made to attack somatostatin function in hopes of freeing the hGH that is already present for a net increase in hGH function or effect. These anti-somatostatin treatments have been intellectually honest but of disappointing effect; typically showing a 1% or so rise in IGF-1 levels, and no measurable clinical difference in patient outcomes. There is no current recommendation favoring the use of these compounds.

**What's the Bottom Line?**

The current paradigm regarding the most efficacious way to augment hGH/IGF-1 levels is still the direct administration of hGH via injection. Dependable correlation exists between dose and level, and accurate monitoring is easily accomplished. Cenegenics® has an investment in the proper approach to this endeavor and is open to future data showing the validity of as yet undeveloped strategies. We will always try to be the first and most definitive source of implementing the state of the art therapies, as they become available.