

Scottsdale Sports Medicine Institute

Men's Health Program

Growth Hormone Releasing Supplements (GOAL)

1. Glutamine

Glutamine is the most abundant amino acid in the body that is used mostly during times of high stress. The immune system and stomach live on glutamine. Glutamine is a key to the metabolism and maintenance of muscle, the primary energy source for the immune system, and essential for DNA synthesis, cell division, and cell growth, all factors that are enhanced by growth hormone (GH). It crosses the blood-brain barrier into the brain, where it increases energy and mental alertness. High levels of glutamine in the blood translates into greater health as a 1994 study revealed.

Dose: 2 grams. Taken at bedtime.

Side effects: abdominal discomfort, diarrhea.

2. Ornithine

Ornithine is a non-essential amino acid that causes the natural secretion of growth hormone (GH). It appears to stimulate GH by blocking secretion of growth hormone inhibitor somatostatin.

Dose: 2 – 5 grams on an empty stomach

3. Arginine

Arginine is an essential amino acid that causes the natural secretion of growth hormone (GH). It appears to stimulate GH by blocking secretion of the growth hormone inhibitor somatostatin. It can be taken stacked together with other amino acids, such as ornithine, lysine and glutamine. Arginine alpha keto glutarate is the most potent form and most well-studied in the research.

Dose: 2 – 5 grams on an empty stomach 1 hour before exercise and before sleeping.

4. Lysine

Lysine is an essential amino acid that affects bone formation, height, and genital function. It works best when combined with arginine.

Dose: 1 gram on an empty stomach 1 hour before exercise and before sleeping.

5. OKG (L-ornithine alpha-ketoglutarate)

This is a designer nutrient that consists of ornithine (see above) bound to alpha ketoglutarate, which is a precursor to glutamine and has growth hormone stimulating effects. It boosts glutamine levels better than glutamine itself.

Dose: 10 g daily with fluids.

6. Glycine

A nonessential amino acid that increases growth hormone levels in the body.

Dose: 250 mg to 6.75 g

7. Tryptophan

An essential amino acid that is a precursor to serotonin – the neurotransmitter that helps stabilize mood and sleep patterns. Tryptophan is converted to serotonin, which increases growth hormone during sleep. It is useful for inducing sleep and reducing effects of jet lag. It appears to be a mind-body regulator, decreasing anxiety and depression and with the addition of vitamin B6 may reduce severity of panic attacks.

Dose: 500 mg to 2 g at bedtime. For best results, take with B6 (30mg) and Vitamin C (250 mg), which the brain uses to convert tryptophan to serotonin.

Metabolic Enhancers

1. CLA

Linoleic acid is found primarily in meat and milk of cows. Research shows it will ↑ metabolic rate, alter body composition by ↑ lean tissue deposition and ↓ fat deposition. The isomers with most biological activity are cis-9, trans-10/11 and cis-12.

1. L-carnitine

A vitamin-like nutrient related to the vitamin B-complex, which is essential for energy production and metabolism of fat. It is crucial for anyone doing aerobic endurance exercise because it is involved in the oxidation of fatty acids, which supply most of the energy for endurance training. It has been shown to help reduce body fat in athletes and bodybuilders, and recent Japanese research revealed that it helps lower high triglycerides.

Dose: 1 – 2 g daily. Only take the L- carnitine form, D and DL have been shown to have adverse cardiac and GI effects due to the salt content.

2. Co-Enzyme Q-10 (Ubiquinone)

CoQ10, as it is known, is an anti-aging drug according to various studies involving rats and mice. It is an antioxidant that helps prevent heart disease, lower blood pressure, improve the gums and reduce periodontal disease, enhances immune function, and stabilizes aging cell membranes. It is important in exercise because it is a vital co-factor in the production of cellular energy. Its benefits include improving aerobic capacity, reducing fatigue, and helping to control the accumulation of fat and reducing body fat.

Dose: 60 mg daily for general muscle repair

100 mg for cardiovascular disease and anti-aging effects.

Diet Intervention

With every meal, we go through a three-stage cycle of feast and fast. In the first hour after eating (stage one), the blood sugar rises and insulin is released, which encourages the storage of excess carbohydrates and fat. After the second hour (stage two), growth hormone is released and the levels of insulin and blood sugar start to fall. At this stage, growth hormone acts to build up muscle protein, an activity that is enhanced by the presence of insulin. In stage three, known as postabsorptive phase, which occurs more than four hours after eating (the fasting stage), the growth hormone concentrations remain at a high level, while the insulin almost disappears. At this stage, growth hormone acts solely to mobilize the body's fat stores for burning as fuel.

Growth Hormone Enhancement Diet

1. **Take GH-releasers (see above)**
Take the GH releasers only before going to sleep. This will give you the best sleep you've had in years and cause the biggest spurts of GH to occur in the first two hours of sleep when they do naturally. During weight training, take them an hour before.
2. **Bulk up on Protein**
Obtain at least 1.2 to 1.5 g/kg body weight of protein/day. Remember to drink at least 10 to 12 glasses of water too. Best sources are lean chicken, fish, soy products, egg whites and whey protein.
3. **Keep Fats low**
Fat blocks the production and release of GH.
4. **Eat carbohydrates that are low on the glycemic index**
Glycemic Index is a measure of how fast a carbohydrate enters the bloodstream and raises your blood sugar level. The higher the food is on the index, the more insulin is secreted. And this promotes fat-storage. Examples of Low Glycemic foods are most fruits and vegetables.
5. **Keep meals at least four hours apart**
This time interval allows the insulin to disappear from your bloodstream so that the growth hormone can act on building muscle. Don't go beyond 5 hours or you will suffer from the effects of hypoglycemia. The slower absorbed proteins in your diet should keep you from becoming hungry. Have your last meal at least four hours before you plan to go to bed.
6. **Fast one day every two weeks (optional)**
The greatest spikes of growth hormone occur during fasting. To prepare your body for a fast, a day or two before, switch to a simple diet of cooked vegetables, salads, and juices, while avoiding grains, breads, dairy products, meat, and fish. Do light exercising, napping, drink 2 to 3 quarts of liquid veggies or fruit juices.
7. **Do GH-releasing exercises**
Both aerobic exercise at very high levels and weight training will stimulate growth hormone. Refer to our Exercise Specialist for details on exercises.
8. **Rest and Recover**

Along with fasting, sleep, either prolonged at nighttime or napping, will cause pulsatile release in growth hormone.

Exclusions to taking GH:

- **History of acromegaly**
- **Fasting blood glucose of 140 mg/dl**
- **Carpal Tunnel Syndrome**
- **Any malignancy or history of malignancy (excluding basal cell skin tumors)**
- **Any personal or first degree relative history of breast cancer**
- **Any history of psychoses or currently on anti-psychotic medications**
- **Any history of major depression**
- **Currently on chemotherapy, immunotherapy, or radiation therapy (except for pituitary disease)**

IGF-1 Serum

	Male (NG/ML)	Female (NG/ML)
2 mos – 5 years	17-248	17-248
6 - 8 years	88-474	88-474
9 - 11 years	110-565	117-771
12 - 15 years	202-957	261-1096
16 - 24 years	182-780	182-780
25 - 39 years	114-492	114-492
40 - 54 years	90-360	90-360
> 55 years	71-290	71-290

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