

















Amino Acid Compendium

 L-Arginine	 L-Lysine
 L-Carnitine	 L-Methionine
 N-Acetyl-L-Cysteine	 L-Ornithine
 Inositol	 L-Phenylalanine
 L-Glucosamine	 L-Proline
 N-Acetyl D-Glucosamine	 Taurine
 L-Glutamine	 L-Threonine
 Glycine	 L-Tyrosine

**Information on
clinical uses | dosages | contraindications**

Researched & written by:

Ilve Hunt

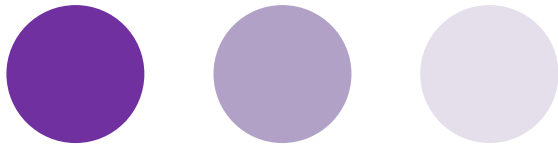
Adv. Dip Hsc (Nat.)

Dip. Herbal Medicine

Member ATMS

On behalf of:

KRPAN Enterprises



Amazing Arginine

L-Arginine

P U R E P O W D E R

T Y P E U S E D : A R G I N I N E H C L

A R G I N I N E H C L is a synthetically manufactured form of Arginine that combines the amino acid with a hydrogen chloride molecule. Hydrogen chloride is combined with Arginine to make the supplement more palatable and to **enhance its absorption** by the digestive system.

Arginine HCL and Athletic Performance

- One of the main effects of Arginine is that it causes vasodilation, by stimulating the smooth muscle endothelial cells that line the blood vessels to produce a compound called nitric oxide.
- Nitric oxide stimulates blood vessels to relax and expand, increasing the flow of blood and oxygen to the muscles during bouts of intense exercise, **especially resistance training**.
- An increase in blood flow and oxygen delivery during exercise may enhance performance, allowing muscles to **produce more strength and delaying the onset of exercise-induced fatigue**.

Arginine HCL and Hormone Production

- Arginine is an important catalyst for the production of **human growth hormone, or HGH**. When ingested, Arginine HCL stimulates the **anterior pituitary gland** to release HGH, increasing plasma levels of HGH circulating throughout the body.
- Naturally elevated levels of HGH have many benefits, including an **increase in muscle recovery and repair, regulation of metabolism, body fat reduction, and the optimal functioning of the heart and kidneys**.

Taking Arginine in conjunction with other amino acids like ornithine, may enhance this effect. Studies suggest **2 Arginine:1 Ornithine** to stimulate HGH production.





Amazing Arginine

L-Arginine

P U R E P O W D E R

OTHER BENEFITS OF ARGININE HCL

Arginine HCL may have a wide range of potential benefits beyond its use as a performance enhancer for athletes.

MedlinePlus reports that possible benefits of Arginine HCL supplementation include improving surgery recovery time, **treating congestive heart failure, reducing chest pain in coronary artery disease, reducing bladder inflammation, treating erectile dysfunction**, improving kidney function, and maintaining a healthy body weight in individuals suffering from muscle-wasting diseases such as HIV.

Side Effects

- Arginine HCL may have adverse effects on individuals who have liver and kidney disease, as well as on **some individuals recovering from a heart attack**.
- Arginine HCL may also **upset the balance of potassium in the bloodstream**.
With a potassium deficiency, Arginine may cause dehydration, nausea, stomach cramps and diarrhea. **Monitor use with blood thinning medications.**
- Individuals with **chronically low blood pressure** are advised not to take Arginine, as it may lower blood pressure even further, leading to fatigue and dizziness.

Dosage

- The recommended dosage of Arginine varies depending on the treatment.
- **For congestive heart failure**, MedlinePlus recommends doses ranging from **6g to 20g** per day, which varies on a case-by-case basis.
- For relieving chest pain caused by clogged arteries, 9 g to 28 g of Arginine is taken in equal increments three or four times daily.
- Men suffering from **erectile dysfunction** may benefit from **5g** of L-Arginine per day.
- 6 g per day is an effective dosage for **improving physical performance**.

This information is for practitioner training purposes only.



Cutting Carnitine

L-Carnitine

P U R E P O W D E R

T Y P E U S E D :

L C A R N I T I N E T A R T R A T E

The Tartrate form is recognized as being the most **natural** and **well absorbed** of the Carnitine family.

While **acetyl Carnitine** is important for brain development, **L-Carnitine tartrate** excels at **weight loss, heart health** and **energy creation**.

The following are all linked to the benefits of the tartrate form of Carnitine.

Therapeutic Use:

Experts say that L Carnitine is it currently the best-researched dietary supplement in the world with 7822 studies listed, and has every appearance of being a proven remedy. Moreover, it is non-toxic, with minimal contraindications and adverse interactions, and well-tolerated by young and old.

Whenever an organism needs energy, L-Carnitine plays an important role.

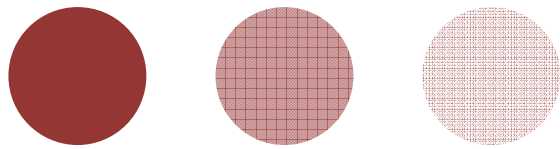
- **Fat Burning:** L-Carnitine mainly increases the rate at which fat is burned. This tends to reduce fat and build up lean muscle mass.
- **Fatty Acid Transport:** L Carnitine is best known as a facilitator of the transport of **fatty acids** into the mitochondria for oxidation.
- **Exercise performance:** The second lesser known role is in maintaining high density exercise via lactic acid minimalization
- **Heart Health:** Minimizing the risk of **heart disease**

FYI:

Healthy subjects consumed a high fat meal, which has been shown to cause impairment of vascular health. It was demonstrated in a trial that 2g of L-Carnitine taken with the meal enhanced vascular responses (increased dilation) to the high fat meal. This was most apparent in those subjects who had the greatest decrease in vascular function. Because vascular dysfunction is an early event in heart disease, Carnitine supplementation can be viewed as a preventative or therapeutic supplement to improve risk for heart disease.

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Cutting Carnitine

L-Carnitine

P U R E P O W D E R

Contraindications

The only contraindications for the use of L-Carnitine are to do with specific diseases and conditions.

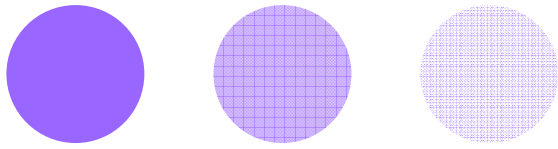
- **Seizures:** If you have ever had a seizure, you should avoid using L-Carnitine. For people with a history of seizures, the use of L-Carnitine has produced an increase in the seriousness and number of seizures, whether taken intravenously or orally.
- **Hypothyroidism:** if you have an under-active thyroid gland, or hypothyroidism, L-Carnitine tartrate may interact with the hormones produced by the thyroid and could have a negative effect. If you know you have hypothyroidism, it is best to avoid taking additionally L-Carnitine tartrate .

Dosage:

2 grams: Most studies are done at this dose, taking Carnitine post training

Take with **carbs (40-80 grams)** for an insulin spike to help shunt Carnitine into muscle tissue for peak performance





Notable NAC

N Acetyl Cysteine

P U R E P O W D E R

T Y P E U S E D :

N A C E T Y L C Y S T E I N E

N Acetyl Cysteine, also known as **NAC**, an amino acid of the sulfhydryl group, is a precursor of cysteine and reduced glutathione which **enhances the production of Glutathione**, a potent anti oxidant.

NAC and Liver clearance:

- Well studied for protecting liver damage from paracetamol (Tylenol) overdose, carbon monoxide poisoning, carbon tetrachloride.
- **Reduces heavy metal** overload: Arsenic, lead, cadmium, mercury, copper excess
- Estrogen clearance ; NAC **removes excess estrogen** metabolites (E2) by moving through methoxylation and conjugation pathways

NAC and Mental Health:

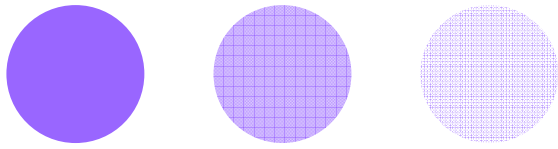
- Studies are ongoing using NAC for Bi Polar disorders and are showing positive results
- Used for **Traumatic Brain Injury** with improvements in memory loss, sleep deprivation due to trauma and helps control dizziness
- Some chemotherapy treatments reduce **cognitive function**; supplementing with NAC and Lysine during chemotherapy helps prevent this decline
- Help with addictions. NAC **normalizes glutamate** in the reward centre of the brain through cysteine-glutamate exchanges thereby increasing glutamate clearance. This results in decreased cravings and addictive behavior.
- Alzheimer's and Parkinson's disease: NAC helps **protect neurons** from damage and degeneration

NAC and Helicobacter Pylori:

- **Inhibits growth** of Helicobacter Pylori
- **Decreases inflammatory cytokines** in the gut

This information is for practitioner training purposes only.





Notable NAC

N Acetyl Cysteine

P U R E P O W D E R

NAC for immunity and lung diseases:

- Chronic Obstructive Pulmonary disease, Cystic Fibrosis and IPE can RESPOND to treatment with NAC
- Treatment for the common cold, respiratory congestion and influenza
- Strong evidence for use as a chemopreventative agent, especially for those at high risk of melanoma

Other conditions:

- Sjogrens Syndrome
- **Reduces Homocysteine** levels
- Prevent complications from kidney disease

Side Effects and Cautions:

- **May reduce copper levels** in the body when using for more than 6 weeks. It is suggested the use of copper supplements when using NAC long term would be beneficial.
- The smell of NAC can be offensive to some. Drinking through a straw can help with this

Interactions:

- Nitroglycerine : (used in some instances for heart problems) **cannot be used with NAC**
- Activated Charcoal: **avoid taking NAC at the same time** as it nullifies the effect of charcoal

Dosage:

- **Take on an empty stomach for best results**
- COPD and other chronic lung conditions: **3 gram in divided doses**
- Acute respiratory infections: **1 gram twice daily**
- Liver clearance and Homocysteine: **up to 2 gram**

This information is for practitioner training purposes only.





Naturalizing NAG

N-Acetyl D-Glucosamine

P U R E P O W D E R

T Y P E U S E D :

N - A C E T Y L D - G L U C O S A M I N E

N-acetyl D glucosamine (NAG) is a type of monosaccharide that is also related to glucose and is chemically similar to glucosamine. However, unlike glucose, N-acetyl glucosamine is not really a sugar but belongs to a **class of compounds called amides**, although it is commonly described as a carbohydrate.

NAG occurs naturally in the outer shells of certain insects and shellfish and is synthesized from the reaction between glucosamine and acetic acid. Although NAG can be found in certain cosmetic products where it is used as an **exfoliating and anti-wrinkle agent**, its main use is as a dietary supplement in the treatment of **autoimmune diseases**.

IBS, Crohn's and Colitis:

The protective wall of the GIT incorporates N-acetyl glucosamine. NAG shows promise in the treatment of inflammatory bowel disease (a class of conditions that includes **Crohn's disease**: from impaired innate immunity which is an abnormal immune response to microbial invasion, and for **colitis**), according to a pilot study published in *Alimentary Pharmacology and Therapeutics* in 2000. Testing on children with severe Crohn's disease and severe ulcerative colitis were conducted. Researchers found that daily treatment with N-acetyl glucosamine led to a significant improvement in symptoms and a **decrease of inflammation** in damaged soft tissue of the GIT in these children.

Auto Immune disease:

A 2011 study from the *Journal of Biological Chemistry* indicates that N-acetyl glucosamine may help suppress the destructive autoimmune response involved in **multiple sclerosis**.

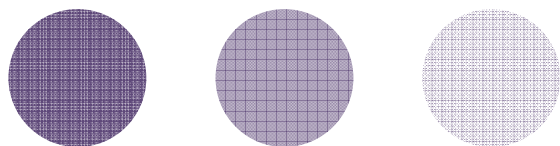
As Glucosamine Sulphate and HCL are also currently used in the treatment of Rheumatoid arthritis, it would be logical to assume that NAG could be used as it suppresses the auto immune response as well as exerts anti inflammatory effects.

How it works:

NAG is the more direct route to the important macromolecules such as **hyaluronic acid, keratin sulfate and chondroitin sulfate**. Unlike the low-molecular glucosamine found in glucosamine sulfate or glucosamine hydrochloride, N-acetyl-D-glucosamine is an advanced molecule that **requires fewer enzymatic steps** before being incorporated into the macromolecules of cartilage. Given that N-acetyl glucosamine saves the user several biochemical steps involved in the conversion of glucose-6-phosphate to N-acetyl glucosamine, it makes an effective product for the treatment of Crohn's disease for example.

Tissue biopsies taken from gastrointestinal tracts of Crohn's patients showed decreased glucosamine synthetase activity in the inflamed tissues. Because of the loss of this important structural carbohydrate, the inflamed tissues experience rapid loss of epithelial cells.





Naturalizing NAG

N-Acetyl D-Glucosamine

P U R E P O W D E R

Suitable for Diabetics:

NAG **does not interfere** with glucose metabolism. Low-molecular glucosamine, as in glucosamine sulfate or glucosamine hydrochloride, has been associated with glucose uptake in patients. This probably occurs because low-molecular-weight glucosamine inhibits glucokinase. Because N-acetyl-D-glucosamine has its own kinase it is not dependent on glucokinase and **does not cause a rise** in glucose levels when consumed.

Note on Shellfish allergy:

Shellfish allergy is triggered by the *meat* of seafood and not by their shells. Therefore, shellfish allergy does not involve chitin or N-acetyl glucosamine. This means that those with shellfish allergy *call safely* take the supplement.

Contra Indications:

How safe is N-acetyl glucosamine? The results of current safety studies suggest that N-acetyl glucosamine is very safe. However, N-acetyl glucosamine is not recommended for pregnant and breastfeeding women as well as those who are about to undergo surgery.

It should be used cautiously by patients who also suffer from asthma, bleeding disorders and kidney problems.

N-acetyl glucosamine should not be combined with anticoagulant drugs such as warfarin.

Side Effects:

None noted

Dosage:

3-6 gram daily in divided doses. NAG dissolves readily and is heat stable, so can be added to hot beverages.





Gallant Glucosamine

L-Glucosamine HCL

P U R E P O W D E R

T Y P E U S E D :

L - G L U C O S A M I N E H C L

Why use Hydrochloride?

Most literature concentrates on Glucosamine Sulphate, only because this is a more prevalent type of glucosamine on the market. In fact, the hydrochloride form is more concentrated than the sulphate form, approx 3000 mg of sulphate = 1500 mg of hydrochloride, and contains substantially less sodium per effective dose than the sulphate form.

Because glucosamine sulphate is stabilized with sodium chloride (table salt) and can contain as much as 30% sodium, there needs to be consideration for individuals who want to reduce their dietary intake of sodium.

Uses for Glucosamine Hydrochloride:

Since glucosamine is a precursor for glycosaminoglycans, which are a major component of cartilage, supplemental glucosamine may beneficially influence cartilage structure, and alleviate arthritis. There have been multiple clinical trials testing glucosamine as a potential medical therapy for osteoarthritis, some, but not all results have supported its use. Glucosamine concentrations in plasma and synovial fluid increase significantly from baseline levels when ingesting Glucosamine hydrochloride and these levels could be biologically advantageous to articular cartilage. In the short term however, the levels are still 10 - 100 fold lower than required to positively affect the cartilage and to build new tissue—so treatment needs to be long term to be effective.

The use of Glucosamine Hydrochloride as a therapy for osteoarthritis appears safe, but watch side effects listed

Dosages:

Osteoarthritis: 1500-2500mg daily

Knee pain: 1000 -1500 mg daily.

Contra Indications:

Warfarin interacts with GLUCOSAMINE HYDROCHLORIDE

There are several reports showing that taking glucosamine (with or without chondroitin) increase the effect of warfarin on blood clotting. This can cause bruising and bleeding.

Medications for cancer (Antimitotic chemotherapy) may interact with Glucosamine hydrochloride as medications for cancer work by decreasing how fast cancer cells can copy themselves and it is postulated that glucosamine might increase how fast tumor cells replicate themselves

This information is for practitioner training purposes only.





Gregarious Glutamine

L-Glutamine

P U R E P O W D E R

T Y P E U S E D : L G L U T A M I N E

naturally fermented at low temperature

Athletic Use:

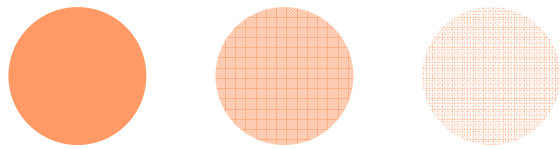
Glutamine is stored in skeletal muscle along with other sites in the body including the intestine, brain and lung. Not much is written about its use in sports medicine and the idea of Glutamine as a muscle repair agent is not well studied, but is used regardless

Other Uses:

- Glutamine is used to counter some of the **side effects** of medical treatments. For example, it is used for side effects of **cancer chemotherapy** including **diarrhea, pain** and swelling inside the mouth (**mucositis**), nerve pain (**neuropathy**), and muscle and joint pains caused by the cancer drug **Taxol**.
- Glutamine is also used to **protect** the **immune system** and **digestive system** in people undergoing radio/chemotherapy for cancer of the esophagus..
- Additionally, glutamine is used for **improving recovery** after **bone marrow transplant** or **bowel surgery**, increasing well-being in people who have suffered traumatic injuries, and preventing infections in critically ill people. After surgery or traumatic injury, nitrogen is necessary to repair the wounds and keep the vital organs functioning. About **one third** of this **nitrogen** comes from **glutamine**.
- Some people use glutamine for digestive system conditions such as **stomach ulcers, ulcerative colitis**, and **Crohn's disease**. It is also used for depression, moodiness, irritability, anxiety, insomnia (not as much evidence)
- People who have HIV can use glutamine to **prevent weight loss (HIV wasting)** This is because the body uses more glutamine than it can replace where there are muscle wasting diseases present
- Glutamine is also used for attention deficit-hyperactivity disorder (ADHD), a urinary condition called cystinuria, sickle cell anemia, and for alcohol withdrawal support.

This information is for practitioner training purposes only.





Gregarious Glutamine

L-Glutamine

P U R E P O W D E R

Dosage:

For adults ages 18 and older: Doses of **500mg, 1 - 3 times daily**, are generally considered safe and used for **general stomach complaints and wound healing**

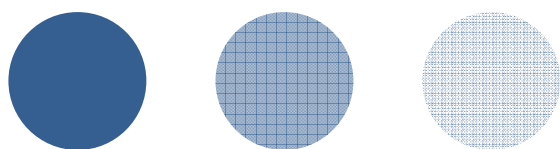
Doses as high as **5,000 - 15,000 mg daily (in divided doses)**, or sometimes higher, may be prescribed by a health care provider for certain conditions. These include Crohn's and **chemotherapy support**.

Caution:

People with kidney disease, liver disease, or Reye syndrome (a rare, sometimes fatal disease affecting children that is generally associated with aspirin use) should not take glutamine.

Some people exhibit signs of excitability and wakefulness when taking glutamine and could be converting Glutamine to Glutamic acid, which could explain these symptoms





Galactic Glycine

Glycine

P U R E P O W D E R

T Y P E U S E D : L G L Y C I N E

Athletic Use:

- **Control blood sugar** levels and protect against **ATP depletion**, optimizing energy levels
- While too much Glycine in the body can cause fatigue, having the proper amount produces the opposite effect - more energy.
- As one of the few amino acids that helps improve blood-sugar storage, some experts suggest Glycine may increase energy for **endurance activities**.
- Glycine has been shown to help **slow muscle breakdown** by supplying **Creatine** to the muscle cells.
- For **growth-hormone release**, Glycine is reportedly more effective when used with ornithine, arginine, glutamine, tyrosine, Vitamin B6, niacinamide, zinc, calcium, magnesium, potassium, and/or Vitamin C.

Other uses:

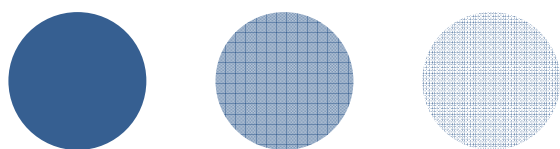
Antacid: Glycine is also used as an **antacid agent** and is reportedly effective for limiting stomach discomfort. In addition, it may help shuttle toxic substances out of the body.

Prostate: Because the prostate contains considerable amounts of Glycine, this nutrient may help **promote prostate health**. In fact, one study found that Glycine, taken with **alanine** and **glutamic acid**, reduced the amount of swelling in the prostate tissue.

CNS Function: Glycine is necessary for **central nervous system function**. Research has shown that this amino acid can help **inhibit the neurotransmitters** that cause **seizure** activity, **hyperactivity**, and manic (**bipolar**) depression. Glycine can also be converted to another neurotransmitter, serine, as needed, and may be beneficial in the management of **schizophrenia**.

Leg Ulcers: When applied as **cream** (see dosage section for [recipe](#))





Galactic Glycine

Glycine

P U R E P O W D E R

Dosage:

Athletic and Other Use: 2-6 grams daily

CNS: 4 gram daily until desired effect is reached. Some clinical trials with schizophrenic patients use **40 to 90 grams** daily (based on .8 gm per kg body weight)

Ischemic Stroke: Putting **1 teaspoon** Glycine under the tongue may help to limit brain damage caused by an ischemic stroke when started within 6 hours of having the stroke.

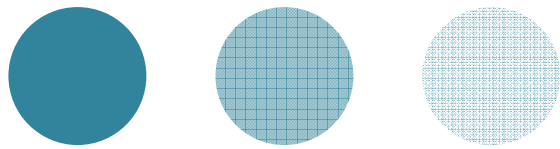
Leg ulcers: A cream containing 10 mg of Glycine, 2 mg of L-cysteine, and 1 mg of DL-threonine per gram of cream has been used. The cream is applied at each wound cleaning and dressing change once daily, every other day, or twice daily as needed.

Caution:

Individuals with **kidney or liver disease** should **not consume Glycine** without consulting their doctor. Taking any one glycerol based amino acid supplement can cause a **disruption** of the **citric acid** or Krebs cycle, and cause a **build-up of nitrogen** or **ammonia** in the body, which makes the liver and kidneys work harder to remove waste.

Clozapine (Clozaril) is used to help treat schizophrenia. Taking Glycine along with clozapine (Clozaril) might decrease the effectiveness of clozapine (Clozaril). It is not clear why this interaction occurs yet. Do not take Glycine if you are taking clozapine (Clozaril)





Intense Inositol

Inositol

P U R E P O W D E R

T Y P E U S E D : M Y O I N O S I T O L

Athletic Performance: Fat Loss | Cholesterol Control | Insulin regulation

Possible Uses for:

Panic disorder: Inositol shows some promise for controlling panic attacks and the fear of public places or open spaces (agoraphobia). One study found that inositol is as effective as a prescription medication. However, large-scale clinical trials are needed before inositol's effectiveness for panic attacks can be proven.

- **Obsessive-compulsive disorder (OCD):** There is some evidence that people with OCD who receive inositol by mouth for 6 weeks experience significant improvement.
- **Polycystic ovary syndrome (PCOS):** Taking a particular form of inositol (isomer D-chiro-inositol) by mouth seems to lower triglyceride and testosterone levels, modestly decrease blood pressure, and promote ovulation in obese or insulin resistant women with polycystic ovary syndrome. Myo inositol is thought to be converted to D Chiro inositol in the body. When using Myo inositol for PCOS, the dose should be two-three times higher than using D Chiro inositol alone. Studies into conception show the myo form stimulates ovulation better than the D Chiro form.
- Problems breathing in premature infants known as "**acute respiratory distress syndrome**" when given intravenously (by IV).
- **Psoriasis** brought on or made worse by **lithium** drug therapy. Inositol doesn't seem to help psoriasis in people not taking lithium.

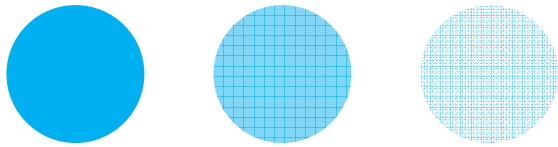
FYI: Bipolar disorder: There is some concern that taking too much inositol might make bipolar disorder worse. There is a report of a man with controlled bipolar disorder being hospitalized with extreme agitation and impulsiveness (mania) after drinking several cans of an energy drink containing inositol, caffeine, taurine, and other ingredients (Red Bull Energy Drink) over a period of 4 days. It is not known if this is related to inositol, caffeine, taurine, a different ingredient, or a combination of the ingredients.

Dosage:

- For panic disorder: **12 to 18 grams** per day
- For obsessive-compulsive disorder: inositol **18 grams** per day.
- For treating symptoms associated with polycystic ovary syndrome: D-chiro-inositol **2 gram** per day
- For treating lithium-related psoriasis: **6 grams** daily

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Lucid Lysine

L-Lysine

P U R E P O W D E R

T Y P E U S E D : L Y S I N E H C L

Athletic performance:

Lysine is important for proper growth, and it plays an essential role in the production of Carnitine, and is sometimes taken with the 2:1 Arginine to Ornithine ratio to produce HGH.

Other Uses:

- Lysine appears to **help the body absorb calcium**, and it plays an important role in the formation of collagen, a substance important for bones and connective tissues including skin, tendon, and cartilage, so may help prevent osteoporosis.
- Most people get enough lysine in their diet, although **athletes, vegans** who don't eat beans, as well as **burn patients** may need more.
- Some studies have found that taking lysine on a regular basis may help prevent outbreaks of **cold sores and genital herpes**. Lysine has antiviral effects by blocking the activity of Arginine, which promotes HSV replication. Studies suggest oral lysine is more effective for **preventing an HSV outbreak** than it is at reducing the severity and duration of an outbreak. One study found that taking lysine at the beginning of a herpes outbreak did not reduce symptoms.
- Lab studies suggest that lysine in combination with L-Arginine **makes bone building cells more active and enhances production of collagen** (possibly by association with HGH?)

Dosage:

- For adults ages 13 and older: Recommendations are **12 mg/kg/day**.
- An example of a dose often used during an active herpes flare up is **3 – 9 gram** per day in divided doses for a short period of time. To prevent recurrences, many people take 2-3 gram daily.

Lysine in the diet is considered safe. High doses have caused gallstones. There have also been reports of renal dysfunction, including Fanconi's syndrome and renal failure. **Use with lysine may increase the risk of nephrotoxicity.**



T Y P E U S E D : L M E T H I O N I N E

Athletic Uses:

- In addition to its role as a precursor in protein synthesis, L-methionine participates in a wide range of biochemical reactions, including the production of S-adenosylmethionine (SAM or SAME), L-cysteine, glutathione, taurine and sulfate.
- Methionine is also a glycogenic amino acid and may participate in the formation of D-glucose and glycogen so may help with energy production and stamina

Other Uses:

- **Liver detoxification:** The ability of L-methionine to **reduce** the **liver-toxic** effects of such hepatotoxins as acetaminophen and methotrexate has led to the suggestion that methionine should be added to acetaminophen products. However, there is some recent research suggesting that elevated L-methionine intake may promote intestinal carcinogenesis. This is unclear.
- **Heavy Metal Toxicity:** L-methionine is involved in the formation of many substances containing protein, as well as providing sulphur. It is necessary for the **bonding** and **excretion of toxic heavy metal** compounds.
- **UTI's:** Methionine is also capable of pushing the **pH-value** of urine into the **acidic part** of the scale, reducing the occurrence of **cystitis** and other **urinary tract infections**. The effectiveness and efficiency of ampicillin and other **antibiotics** is also **improved** where the pH-value ranges between 4 and 6.

Absorption:

- Some metabolism of L-methionine takes place within the **intestines**. That which is not metabolized is transported to the liver via the portal circulation. In the **liver**, L-methionine, along with other amino acids, participates in protein biosynthesis. It may also participate in a wide variety of metabolic reactions, including the **formation of SAME, L-homocysteine, L-cysteine, taurine and sulfate**. There is where it is also metabolized to produce D-glucose and glycogen.
- L-methionine not metabolized in the liver is transported to the various tissues of the body where it is involved in reactions similar to those described above.



Cautions and Interactions:

- One of the metabolites of L-methionine, **L-homocysteine**, has been implicated as a significant factor in coronary heart disease and other vascular diseases. Perhaps taking Methionine with taurine, B6, B12 & Folate may counter this production?.
- Amino acids like methionine, Creatine and SAMe can **inhibit** your absorption of the Parkinson's disease medication **L Dopa** warn the University Of Pittsburgh Medical Center.
- In general, it is recommended while you're taking methionine supplements to take extra B-complex vitamins, particularly **vitamin B6, vitamin B12 and folate**. This is because taking methionine while you have a **B-vitamin deficiency** could increase your blood levels of homocysteine and cholesterol, both of which are linked to elevated risks for atherosclerosis.

Dosage:

- Even without B-vitamin deficiencies, taking high doses of methionine **-7g daily or more-** can increase your homocysteine levels.
- Studies show taking up to **2g per day** of methionine doesn't appear to cause any serious adverse effects.



Ornate Ornithine

L-Ornithine

P U R E P O W D E R

T Y P E U S E D : L O R N I T H I N E H C L

Athletic Performance:

- Stimulation of GHG in combination with Arginine HCL
- Results suggest that L-Ornithine has an anti fatigue effect in increasing the efficiency of energy consumption

Other Uses:

- Ornithine is the driving force of action of the enzyme Arginase which creates Urea. Therefore, ornithine is a central part of the urea cycle, which allows for the disposal of excess nitrogen and ammonia.
- Ornithine uses Ammonia and Nitrogen to produce Urea which is then excreted by the kidney.
- Used in Parasite Cleansing to mop up ammonia produced from parasites. Excessive ammonia can cause insomnia, according to Hulda Clarke.
- Possibly an adjunct treatment to those with impaired liver function due to excess ammonia and nitrogen (shown in blood tests)
- Useful for wound healing post surgery due to the fact it acts as a precursor of citrulline, proline and glutamic acid, all of which play a role in healing.

Interesting Note: High ammonia levels can occur for a variety of reasons. Causes for elevated ammonia in your blood include parasites, liver failure, hepatitis, liver cirrhosis, Reye's syndrome in children, intestinal bleeding, cardiovascular conditions, kidney complications and a rare, inherited disorder of the urea cycle called Citrullinemia. If left untreated, these conditions can lead to complications like a liver abscess.

Early symptoms of high ammonia levels can include **lethargy, confusion and memory difficulties.**

Dosage:

- Parasites: 1-3 grams at night
- Athletes: 3-6 grams. L Ornithine HCL is generally considered safe to take in high doses.



Ornithine doing some sort of conversion thing..





Formidable Phenylalanine

L-Phenylalanine

P U R E P O W D E R

T Y P E U S E D :

L P H E N Y L A L A N I N E

Phenylalanine is found in 3 forms: **L-phenylalanine, the natural form** found in proteins; D-phenylalanine (a mirror image of L-phenylalanine that is made in a laboratory), and DL-phenylalanine, a combination of the 2 forms.

Athletic and Other Uses:

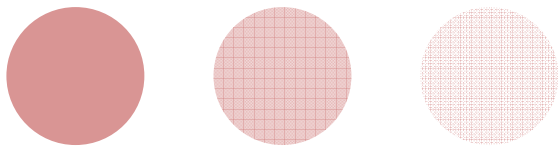
- Metabolism: L-phenylalanine acts primarily on the **digestive system** and the **metabolic rate**.
- One of phenylalanine's primary functions is to serve as a **precursor** to the amino acid **tyrosine**, which in turn is needed to produce the hormone **thyroxine**.
- **Appetite Suppression:** Phenylalanine also stimulates the release of cholecystokinin, a digestive system hormone that produces a feeling of satiety after eating and decreases interest in eating, as well as being a precursor molecule for the neurotransmitter norepinephrine, a compound that also plays a role in controlling appetite.
- **Depression:** The body changes phenylalanine into tyrosine, which makes proteins, brain chemicals, including **L-dopa, epinephrine, and norepinephrine**, and thyroid hormones.
- Pain Control: D Phenylalanine (but not L-phenylalanine) has been used to treat chronic pain
- Skin Conditions: **Vitiligo**. Phenylalanine is a **precursor to melanin** via L Tyrosine so is used in the treatment of Vitiligo along with sunlight therapy.

Dosage: No more than 5 gram a day for any conditions.

- More than 5 gm can cause neuropathies.
- D, L-Phenylalanine **competes** with other **amino acids**. They have to be able to pass through the stomach and blood brain barrier without competition.
- The consensus of experts recommends taking phenylalanine on an **empty stomach** 15-20 minutes before eating. Avoid taking them with other amino acids or other supplements.
- It is recommended to start with **500-1,000 mg** as soon as you **awake**. Some people may take another 500-1,000 mg 4-6 hours later.
- Taking phenylalanine too close to bedtime may keep you awake.

This information is for practitioner training purposes only.





Formidable Phenylalanine

L-Phenylalanine

P U R E P O W D E R

Drug Interactions and Cautions:

- **Monoamine Oxidase Inhibitors:** Monoamine oxidase inhibitors (MAOIs) are an older class of antidepressants drugs that are rarely used now. They include phenelzine (Nardil), isocarboxazid (Marplan), and tranylcypromine sulfate (Parnate). Taking phenylalanine while taking MAOIs may cause a severe increase in blood pressure (hypertensive crisis)
- **Levodopa:** A few case reports suggest that phenylalanine may reduce the effectiveness of levodopa (Sinemet), a medication used to treat Parkinson's disease.
- **Antipsychotic drugs** can interact with Phenylalanine
- These include chlorpromazine (Thorazine), clozapine (Clozaril), fluphenazine (Prolixin), haloperidol (Haldol), olanzapine (Zyprexa), perphenazine (Trilafon), prochlorperazine (Compazine), quetiapine (Seroquel), risperidone (Risperdal), thioridazine (Mellaril), thiothixene (Navane), and others.

Caution:

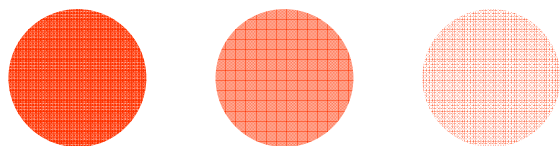
Melanoma patients should avoid taking L-phenylalanine and L-tyrosine. Certain cancers, such as melanoma, depend on these amino acids to fuel their growth.

Supplemental use of L-phenylalanine and L-tyrosine may **raise or normalize blood pressure**.

Insomnia may be a side effect if taken too close to bedtime.

Some researchers think L-phenylalanine use can cause a number of side effects, including high blood pressure, nausea, heartburn, difficulty sleeping and mood swings, especially irritability. This is usually due to high dosing.





Perfecting Proline

L-Proline

P U R E P O W D E R

T Y P E U S E D : L - P R O L I N E

Proline is the amino acid necessary for the production of collagen and cartilage for healthy joints, ligaments and skin.

L-Proline for **Cardiovascular Health:**

L-lysine and particularly L-proline are important substrates for the biosynthesis of matrix protein and **competitively inhibit** the binding of lipoprotein to the vascular matrix which prevents **cholesterol build up** and resulting arterial plaque. Maintaining the integrity and physiological function of the vascular wall is the key therapeutic target in controlling cardiovascular disease.

L-Proline for **fine lines and wrinkles:**

When proline is taken, the **stability of collagen** is increased, making it a desirable supplement for **skin integrity and decreasing fine lines and wrinkles**

L-Proline to **heal wounds:**

Proline initiates the biochemical pathway for connective tissue repair and collagen production, therefore increases wound healing and minimizes scar formation

Doses:

Reducing cholesterol plaque (research from Linus Pauling)

Preventative:

Vit C: 3 gm, Lys: 2 gm, Proline 2 gm

Treatment:

As above, but increasing by 50% more

Skin and wound healing: 2 – 5 gm daily, weight dependant

This information is for practitioner training purposes only.





Perfecting Proline

L-Proline

P U R E P O W D E R

Contraindications:

The intake of L-proline may lead to the development of neurological problems such as seizures and intellectual disability in patients with **hyperprolinemia**, a rare genetic condition caused by the excesses in proline levels, according to the Genetics Home Reference of the National Institutes of Health.

If you have high levels of **lactic acid** in your blood, you are also predisposed to hyperprolinemia, because lactic acid inhibits the breakdown of proline

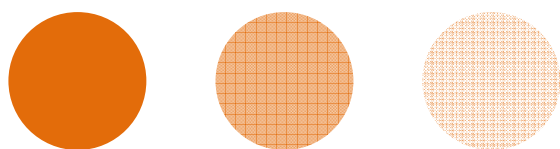
People who have **chronic kidney failure** should not take any amino acid supplement without consultation with their physician

Smokers should avoid proline supplements and foods that are high in proline if they eat foods preserved with nitrates or that release nitrates during the process of pickling, because, in smokers, nitrates can convert proline into the potent carcinogen N-nitrosoproline.

People who have **alcohol-related liver disease** should not take proline, as they usually already have high levels of proline in the bloodstream. Chronic liver inflammation interferes with the body's ability to make collagen anywhere except in the liver, where proline is used to form the collagen that forms the fibers that cause cirrhosis of the liver.

People who have **allergies** should avoid proline as it increases levels of histamine in the bloodstream.





Tantalizing Taurine

Taurine

P U R E P O W D E R

T Y P E U S E D : L T A U R I N E

Athletic Performance:

- The amino acid Taurine is believed to enhance the **effect of adrenalin** in the body by increasing the number of **adrenalin receptors** in the body, but not enough studies verify this
- The levels of some amino acids can rise in the **muscle cells** when taking Taurine, specifically **glutamine** and the **BCAAs valine, leucine and isoleucine**. It may be that Taurine raises the concentration function of glycogen precursors.

Other Use

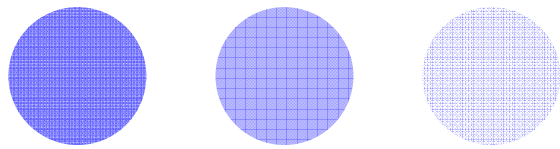
- In a recent study, scientists discovered that taurine supplements may help **reduce levels of homocysteine**
- Taurine also occurs naturally in the body and plays a key role in many biological processes, such as **detoxification** and regulation of **nerve-cell** activity. Although low levels of taurine have been linked to several conditions (including eye diseases and cardiovascular problems), research on the health benefits of taurine supplements is fairly limited.
- There's some evidence that taurine may **protect against diabetes** and diabetes-related complications and may help **prevent the onset of type 2 diabetes**.
- Published in Diabetes/Metabolism Research and Reviews in 2001, an earlier report indicates that taurine supplementation shows promise in the prevention of certain diabetes-related complications (such as **atherosclerosis**).
- Taurine may help treat **high blood pressure**, according to a 2002 report published in Amino Acids. Looking at data from preliminary research, the report's authors found that taurine supplementation may lead to significant decreases in blood pressure
- Relieving **panic attacks** and **anxiety** due to **GABA** effects of Taurine

Dosage

- **3-5 grams** for panic attacks, anxiety
- **3-5 grams** for homocysteine and heart (studies done on 3 gram for 4 weeks)
- **6 grams** for athletes (in divided doses)

This information is for practitioner training purposes only.





Thorough Threonine

L-Threonine

P U R E P O W D E R

T Y P E U S E D : L - T H R E O N I N E

Athletic use:

May speed wound healing and recovery from injury by keeping the connective tissue strong to facilitate faster healing. Threonine is needed to create [glycine](#) and [serine](#), two [amino acids](#) that are necessary for the production of collagen, elastin, and muscle tissue. It is also found in significant amounts in the heart.

Liver Function:

Threonine combines with the amino acids [aspartic acid](#) and [methionine](#) to help the liver with the digestion of fats and fatty acids.

Nervous System Disorders:

Threonine supplementation may be useful in the treatment of Lou Gehrig's disease, Amyotrophic Lateral Sclerosis (ALS) where there is a Glycine deficiency. Administering glycine directly is ineffective, since it cannot cross into the central nervous system, so it needs Threonine to facilitate the shuttle. Research indicates that symptoms of Multiple Sclerosis (MS), another disease that affects the nerve and muscle function, may be lessened with threonine supplementation

Uric acid reduction:

Uric acid accumulation in the body predisposes the body to Gout. The amino acid threonine, along with glycine, are important compound for the removal of purines - these are compounds that break down into uric acid, which itself is a by-product of protein digestion in the human body.

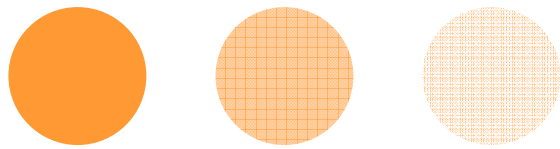
Dosage:

When taken in dosage of anything between 2 and 4 grams every day for a maximum period of about 12 months the use of threonine appears to be safe. However, some people using this essential amino acid may suffer from negligible side effects like headache, stomach disorder, queasiness and skin rash.

Nervous System Disorders; ALS, MS; Depression:

One 1992 study showed that 7.5 grams of threonine taken daily decreased spasticity among study participants. Individuals suffering from clinical depression can also benefit from using dosages consisting of one gram of threonine two times daily - this supplementation generates a marked improvement in the affected person.





Tenacious Tyrosine:

L-Tyrosine

P U R E P O W D E R

T Y P E U S E D : L T Y R O S I N E

Athletic Uses:

Supplements that boost the brain's dopamine concentration are of interest to endurance athletes. Some research has suggested that tyrosine might have an effect at a **high temperature**. At high temperatures athletes tire more quickly. In the brain tyrosine is converted – also via L-Dopa – into dopamine. Dopamine is a neurotransmitter that motivates people to continue and **suppresses feelings of fatigue** and is activated by high temperatures produced by aerobic activity.

Other Uses

Cognitive function

In addition, a 2007 study of 19 people (published in *Physiology & Behavior*) found that use of tyrosine supplements helped protect against the detrimental effects of severe cold exposure on cognitive performance and memory.

Depression and mood disorders

- Tyrosine (actually L-tyrosine) is an amino acid **precursor** of the neurotransmitters **norepinephrine** and **dopamine**. Taking tyrosine on an empty stomach is supposed to cause an increase in norepinephrine and dopamine in the brain, which can lead to increased energy, alertness and improved moods, thus relieving depression.
- Unlike St John's wort, that can take two months to work, and prescription antidepressants, which probably won't kick in for about six weeks, **tyrosine works very quickly**. However, because it can raise blood pressure in some people, it must be used cautiously by individuals with hypertension and can also cause anxiety.
- **Healing the thyroid** can be a useful adjunct in the treatment of depression. As a precursor of the thyroid hormones thyroxine and triiodothyronine, L tyrosine can help to elevate mood and promote well-being that is hindered by low thyroid function.

PKU (phenylketonuria)

This serious condition occurs in people whose bodies can't use the amino acid phenylalanine. It can lead to brain damage, including intellectual disability. People with PKU must avoid any phenylalanine in their diets. Because tyrosine is made from phenylalanine, people with PKU can be deficient in tyrosine.



Tenacious Tyrosine:

L-Tyrosine

P U R E P O W D E R

Dosage

Thyroid Function and Mood disorders:

500-1000 mg twice daily

PKU

500-1000mg once daily

Take L Tyrosine **at least 30 minutes before meals**, divided **into 2-3 daily doses**. Taking vitamins B6, B9 (folate), and copper along with tyrosine helps the body **convert tyrosine** into important brain chemicals. There is no research to indicate taking Tyrosine in juice enhances absorption

Possible Interactions

Be cautious with the following:

Monoamine Oxidase Inhibitors (MAOIs) -- Tyrosine may cause a **severe increase in blood pressure** in people taking antidepressant medications known as MAOIs. This rapid increase in blood pressure, also called "hypertensive crisis," can lead to a heart attack or stroke. People taking MAOIs should avoid foods and supplements containing tyrosine. MAOIs include:

- Isocarboxazid (Marplan)
- Phenzelzine (Nardil)
- Tranylcypramine (Parnate)
- Selegiline

Thyroid hormones -- Tyrosine is a precursor to thyroid hormone, so it might raise levels too high when taken with synthetic thyroid hormones. (Monitor)

Levodopa (L-dopa) -- Tyrosine **should not** be taken at the same time as **levodopa**, a medication used to treat Parkinson's disease. Levodopa may interfere with the absorption of tyrosine.



How to make the most of your HealthWise® Amino Acids

Tips for best results:

- Use your weight chart for correct dosage
- Most amino acids are thought to be absorbed best when taken:
 - on an **empty stomach**
 - **between meals** and
 - **in divided doses**

However there are always exceptions to the rule and there may also be several co factors that are required for the uptake of amino acids which will be listed.

- **Most amino acids will be well tolerated** by the general population. Some individuals however, can experience stomach upsets and nausea which dictates that these aminos may be taken with meals, although this is said to reduce absorption and uptake in cells due to the competitiveness of other amino acids.
- Store aminos in a cool, dry area away from light
- Some nutritionally oriented physicians contend that in order to prevent an imbalance of amino acids in your body and give your system a periodic break, you should take an amino acid complex along with any single amino acid that you're on for more than one month for a 2 week period then resume your single amino acid treatment. This is not standard practice however.



L Arginine HCL:

Tips for GH production:

L-arginine, or l-arginine hydrochloride, taken on an empty stomach, will cause a significant release of growth hormone in many people.

L-arginine is most effective as a growth hormone releaser for people between the ages of about 25 to 45.

It is necessary, however, to use a very large dose of arginine: 10 to 30 grams, depending upon many factors such as one's age and body weight

Tips for effectiveness:

Arginine levels can best be maintained by not taking it continuously. A schedule of something like four weeks of continuous use followed by a two-week break generally works best.

When carbohydrates are present in large amounts, particularly when combined with high temperatures (like post workout), it can be rendered nutritionally unavailable to the body, so take well away from carbohydrate based meals.



L Carnitine bi tartrate:

Tips for Absorption:

Absorption is the key for maximum effects in fat loss. Insulin is the most effective agent at helping more L-carnitine get inside muscle cells. So, by combining L-carnitine with an insulin-elevating supplement or meal, you can ensure maximum carnitine retention in muscle cells.

Best time of day to take L-carnitine:

It all depends on your primary goal. If your main concern is fat loss, then it's best to take carnitine with your largest meals of the day. If your primary goal is muscle growth, performance, or recovery, then you're best to take carnitine before and after your workouts with some insulin-spiking carbs

An effective dosage of L-carnitine tartrate is 1,000 to 2,000 milligrams daily, usually split up into two servings

Glucosamine HCL:

Absorption:

83% HCL VS 63% Sulphate, HCL is the original form of glucosamine. May be taken with or without food, but high doses are not to be taken (anything over 1500mg) by diabetics.

May be taken with food.

L Glutamine:

Tips for absorption for stomach ailments:

Take it three times a day in divided doses on an empty stomach as it is sensitive to stomach acids

The best times to take it are in the morning, after a workout and before going to bed. Taking glutamine when you wake up is ideal because your muscles have gone all night without nutrition.

Tips for absorption for sports performance :

Taking it after a workout helps the muscles recover.

Taking it before bed helps increase growth hormone in your body.

Glycine

Best time to take Glycine:

Though Glycine can be absorbed from food, it would be difficult on an ordinary diet to absorb enough to saturate the blood. At saturation levels, Glycine readily crosses the blood brain barrier via passive diffusion.

A supplemental dose of 3 g before bed readily accomplishes this.

For Creatine conversion:

Glycine is best taken away from meals or pre workout if you are desiring it to convert to creatine

Inositol

Tips for Anxiety/OCD treatment:

If you take Inositol for anxiety/OCD, medical professionals advise starting with 2,000 mg twice a day. After one week, this can be increased to three times per day. During the third week, you can slowly begin to increase the Inositol by small amounts to 3,000 mg three times daily; the fourth week, to 4,000 mg three times per day; and the fifth week, 5,000 mg three times each day. In the sixth week, you will reach a suggested maximum dosage of 6,000 mg three times a day.

You may find that using Inositol on its own may not be enough to treat anxiety. Many take it in conjunction with Omega-3 supplement, valerian root, and passionflower to enhance the effects.

There are a few side effects to watch out for when taking this supplement, although stomach upsets may occur, but studies have shown this to be a relatively normal side effect . Some users report that their appetites greatly increased after starting an inositol regime

There is some evidence to show that caffeine interferes with inositol uptake.

Best time to take Inositol:

There is conflicting evidence whether this amino acid can be taken all at once, in divided doses, with or without food, but it seems best absorbed in the morning before breakfast.

Inositol does not dissolve very well, so it needs to be stirred, and drunk while the water is still in motion.

L Lysine

L Lysine has no known toxicity. Although a few cases of abdominal cramps and diarrhea have been reported with very high doses (more than 10 grams a day).

Best way to take Lysine:

If you feel a virus coming on, take 1 Lysine every hour for 8 hours or until symptoms desist.

Lysine is best taken on an empty stomach - but if you have forgotten a serving, you may take it with food.

Postmenopausal women can take Lysine with meals to encourage absorption of calcium by the body.

For cold sores: Take 1,000 mg L-Lysine three times a day with meals for flare-ups. If you are subject to recurrent outbreaks of cold sores, continue on a maintenance dosage of 1,000 mg day.

L Methionine

Tips for absorption:

During methionine supplementation, intake of taurine, cysteine, and other sulfur containing amino acids, as well as B6 and folic acid should also be included. Taking it with a tablet for liver support would be ideal.

Recommended dosage ranges from 500 mg to 4,000 mg in divided dosages throughout the day, away from meals

Remember that those with high homocysteine should only take 2 grams a day



N Acetyl Cysteine

Special tips:

Regular supplementation with NAC will increase the urinary excretion of copper. So if you're using NAC for an extended period of time, it's probably wise to add both copper (2 mg a day) and zinc (30 mg a day) to your treatment regimen.

If you use NAC for more than a month, add a mixed amino acid complex to your treatment regimen to ensure that you are getting adequate, balanced amounts of all the Amino acids.

Tips for absorption:

NAC is most effective when taken on an empty stomach, with a small amount of vitamin C powder mixed in

If you've added a mixed amino acid complex to your NAC regimen, be sure to take it on an empty stomach as well, but at a different time of day than you take the NAC.

As the Acetyl portion of the amino acid is quite irritating to the teeth, taking it through a straw is advised, and it also makes it more palatable

Special caution:

Evidence indicates that in some healthy individuals, high doses of NAC (3,000 mg a day) can act as a pro-oxidant rather than an antioxidant, actually lowering levels of glutathione rather than increasing them. For this reason, otherwise healthy individuals may want to avoid taking high doses of NAC until more information is available.

L Ornithine:

Best time to take for performance:

Studies show Ornithine reduces ammonia concentrations in the blood and thus enhances performance of prolonged exercise (45 minutes or more) which is in part due to Ornithine remaining elevated in the blood for a few hours after ingestion. On this basis, it is suggested pre workout or between meals for reducing excess ammonia.

Best time to take when on a parasite treatment program:

For parasites or in combination with Arginine (2 arg: 1 Orn ratio) for GH production, take before bed on an empty stomach

L Phenylalanine

Special tips:

With high blood pressure, start with very low amounts, such as 200 mg a day. Increase the dose slowly only if safe to do so.

L Phenylalanine is best taken on an empty stomach with water or juice about an hour before meals. High-protein foods, in particular, can interfere with proper absorption.

Handy Tip:

At recommended doses, DLPA occasionally causes mild side effects, such as heartburn, nausea, or headaches. This can be prevented by taking it with a glass of water. At excessive doses (more than 1,500 mg a day), it can cause numbness, tingling, or other signs of nerve damage over a period of time

Taurine

Tips for absorption:

Taurine is found in pre and post workout formulas, and in sugar laden energy drinks, so the general concensus is out on the best time to take it and whether it needs an insulin spike or not to allow it to enter cells.

Tyrosine:

Tips for neurotransmitter production:

L-Tyrosine should be taken before meals, preferably 30 minutes before, and divided into two or three doses daily.

Tyrosine supplements are best taken with a B group or multivitamin/mineral complex because vitamins B6, B9, folic acid and the copper mineral help in the conversion of L-tyrosine into neurotransmitters



HealthWise® Amino Acids - Specific Weight Chart

Amino Acid – Pure Pharmaceutical Grade Powder	per 5ml
L-Arginine (HCL)	3300mg
L-Carnitine (Tartrate)	2950mg
Inositol (Myo)	3600mg
L-Glucosamine (HCL)	3600mg
L-Glutamine	3300mg
Glycine	4500mg
L-Lysine (HCL)	3500mg
L-Methionine	2500mg
N-Acetyl-L-Cysteine	2350mg
L-Ornithine (HCL)	3000mg
L-Phenylalanine	3500mg
Taurine	3800mg
Tyrosine	1800mg

Note: The above measurements display the amount of milligrams per amino equivalent to a 5ml metric teaspoon. Powders are loosely filled, levelled but not compacted.

HealthWise® Amino Powders are pure pharmaceutical grade powders and are packed by weight not volume, without the use of fillers or flowing agents. Some of the powders are slightly hygroscopic (retain moisture) and this can result in clumping. This can be broken apart with a spoon before taking or dissolved in water.

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PO Box 8177 MAROOCHYDORE DC QLD 4558
PH: 07 5450 8266 FAX: 07 3009 0374

www.krpan.com E-mail: mail@krpan.com