

Part 1: Amino Acids

B. Indications, Therapeutic doses and Contraindications / Cautions of Amino Acids

Amino Acid	Indications	Therapeutic Dose Range	Contraindications / Cautions
Alanine	<ul style="list-style-type: none"> - Cancer¹ - Diabetes / hypoglycaemia¹ - Athletic performance¹ 	200 – 600 mg ¹	<ul style="list-style-type: none"> - Competes with taurine transport.¹
Arginine	<ul style="list-style-type: none"> - Cardiovascular conditions¹ - Liver and kidney disorders^{1,2} - Immune function³ 	400 – 6000 mg ¹	<ul style="list-style-type: none"> - > 200-400g: may cause hyperkalemia and hyperphosphatemia, a decrease in brain pool of lysine, which results in loss of appetite, thickening and coarsening of skin.¹ - Increasing dosage increases methylation, which may aggravate schizophrenia.¹ - Do not give to patients with herpes and pseudomonas, as it promotes their growth.¹ - Avoid if pregnant or lactating.²
Aspartic Acid	<ul style="list-style-type: none"> - Athletic performance¹ - Detoxification^{1,3} - Part of active sites on enzymes.³ 	1.5 – 2 g / day ¹	<ul style="list-style-type: none"> - Similar to monosodium glutamate.¹ - Magnesium and zinc reduce toxicity.¹
Carnitine	<ul style="list-style-type: none"> - Cardiovascular conditions¹ - Renal failure^{1,4} - Athletic performance¹ 	<ul style="list-style-type: none"> - 400 – 2000 mg¹ - 50 – 200 mg / kg body wt. for lipid storage disease¹ 	<ul style="list-style-type: none"> - Overdosing may cause diarrhoea, irritability, ketosis, lethargy and personality changes.¹ - Fish odour syndrome¹

Creatine	<ul style="list-style-type: none"> - Chronic heart failure³ - Athletic performance⁵ - Muscle aches and pains / Sports Injuries⁵ 	2 g / day ³	<ul style="list-style-type: none"> - Reported side effects include dehydration, stomach and muscle cramps, diarrhoea and water retention.⁵ - Experts caution that extended high doses can lead to kidney and liver problems.⁵ - Avoid taking high doses of creatine with NSAIDs, may put added stress on the kidneys.⁵
Cysteine, Cystine	<ul style="list-style-type: none"> - Detoxification^{1,3} - Diabetes Mellitus¹ - Liver disease¹ 	200 – 500 mg ¹ Take with vitamin C and B ₆	<ul style="list-style-type: none"> - Toxicity may lead to cystinosis/ fanconi's syndrome, which leads to kidney dysfunction and stones.¹
Glutamic Acid	<ul style="list-style-type: none"> - Benign Prostatic Hyperplasia⁶ - Heart Disorders⁶ - Personality disorders^{2,3} 	20 – 35 mg / day ⁶	<ul style="list-style-type: none"> - High dosages of glutamic acid may cause headaches and neurological problems.⁶ - Excess monosodium glutamate may give rise to Chinese restaurant syndrome – burning sensation on lips, flushing.¹ - > 300 mg may cause mania in some individuals.¹
Glutamine	<ul style="list-style-type: none"> - Alcoholism^{1,2,3} - Enhance mental function^{2,3} - Gut Function^{2,3} 	500 – 3000 mg ¹ Athletes: 8 – 10 g ¹	<ul style="list-style-type: none"> - Contraindicated in hyperammonemia, ammonia intoxication or nitrogen excess.¹ - Avoid in Reye's syndrome, kidney disease, and cirrhosis of the liver.²
Glycine	<ul style="list-style-type: none"> - Prostate health^{1,2} - Schizophrenia³ - Memory / Cognition⁶ 	4 – 30 g ¹	<ul style="list-style-type: none"> - Too much can displace glucose in the metabolic chain and cause fatigue.²

Histidine	<ul style="list-style-type: none"> - Rheumatoid arthritis ^{1,2} - Anaemia ^{1,2} - Allergies ^{1,2} 	<p style="text-align: center;">1 – 6 g Infants: 33 mg / g body weight ¹</p>	<ul style="list-style-type: none"> - Dosages >5% of diet resulted in growth depression and a 10 fold increase in brain histidine levels. → levels of isoleucine, leucine, tyrosine and phenylalanine in the brain decreased by 50%. ¹
Inosine	<ul style="list-style-type: none"> - Myocardial infarction ³ - Athletic performance ³ - Wound healing ³ 	<p style="text-align: center;">Athletes: 5 – 6 g / day ⁶</p>	<ul style="list-style-type: none"> - The body converts unused inosine to uric acid, which may be hazardous to people at risk for gout. ⁶
Isoleucine	<ul style="list-style-type: none"> - Athletic performance ¹ - Hepatic and Renal failure ¹ - Phenylketonuria ¹ 	<p style="text-align: center;">5 – 10 g ¹</p>	<ul style="list-style-type: none"> - People with kidney or liver disease should not consume high amounts of amino acids without consulting their doctor. ⁶
Leucine	<ul style="list-style-type: none"> - Liver and kidney failure ¹ - Athletic performance ¹ - Recovery from surgery ^{1,2} 	<p style="text-align: center;">170 – 1100 mg ¹</p>	<ul style="list-style-type: none"> - Excess may precipitate pellagra in marginal vitamin B₃ deficiency. ¹ - Take in moderation, or hypoglycaemia may result. ²
Lysine	<ul style="list-style-type: none"> - Herpes infection ^{1,2,3} - Recovery from surgery ^{1,2} - Promotes growth in children. ^{1,3} 	<p style="text-align: center;">300 – 3000 mg Child: 44 mg / kg body weight ¹</p>	<ul style="list-style-type: none"> - May increase triglycerides and cholesterol levels at high dosage. ¹ - Abdominal cramps and transient diarrhoea have occasionally been reported at very high (15 – 40 g per day) intakes. ⁶
Methionine	<ul style="list-style-type: none"> - Detoxification ^{1,2} - Liver and kidney disease ^{1,2} - Parkinson's disease ¹ 	<p style="text-align: center;">200 – 800 mg ¹</p>	<ul style="list-style-type: none"> - Excessive methionine intake, coupled with deficiencies in vitamins B₆, B₉ and B₁₂, can increase the conversion of methionine to homocysteine, which is linked to heart disease and stroke. ^{1,6}

Ornithine	<ul style="list-style-type: none"> - Immune function² - Liver disease² - Athletic performance² 	5 – 10 g / day ⁶	<ul style="list-style-type: none"> - Do not give to children unless prescribed by physician.² - Gastrointestinal distress with intakes over 10 g per day.⁶
Phenylalanine	<ul style="list-style-type: none"> - Depression^{1,2} - Pain² - Appetite control / Obesity^{1,2,3} 	150 – 600 mg / day ¹	<ul style="list-style-type: none"> - Can cause anxiety, headaches and hypertension.¹ - Should not be used by women who are pregnant or lactating.^{1,2} - Should be avoided by those with high blood pressure, phenylketonuria or with existing pigmented melanoma.²
Proline	<ul style="list-style-type: none"> - Cardiovascular conditions¹ - Joint / Tissue repair¹ - Cancer¹ 	500 – 1000 mg ¹	<ul style="list-style-type: none"> - Excess can lead to convulsions, increased blood calcium and osteoporosis.¹
Serine	<ul style="list-style-type: none"> - Memory¹ - Multiple Sclerosis¹ - Pain relief¹ 	None given ¹	<ul style="list-style-type: none"> - Can exacerbate psychosis if vitamin B₆ is limiting.¹
Taurine	<ul style="list-style-type: none"> - Cardiovascular conditions^{1,2,3} - Liver disease^{1,3} - Cataract prevention^{1,3} 	250 – 2000 mg ¹	<ul style="list-style-type: none"> - May aggravate individuals with stomach ulcers, gastric upsets, loose motions.¹
Tryptophan	<ul style="list-style-type: none"> - Insomnia^{1,2,3} - Psychiatric conditions^{1,2,3} - Weight control^{1,2} 	300 – 4000 mg ¹	<ul style="list-style-type: none"> - A contaminant associated with Tryptophan has been linked to eosinophilia-myalgia syndrome (EMS).^{1,2} - Contraindicated in those taking MAOIs, and those with adrenal insufficiency or scleroderma.¹

Tyrosine	<ul style="list-style-type: none"> - Depression ^{1,2,3} - Weight control ^{1,2} - Withdrawal from drugs ^{1,2,3} 	400 – 6000 mg ¹	<ul style="list-style-type: none"> - Care must be taken if given in conjunction with MAOIs. ¹ - Avoid giving to patients with melanoma or glioblastoma. ¹ - Dosage greater than 3% of diet may result in corneal lesions, eye problems, palm and sole erosion, skin lesions. ¹
Valine	<ul style="list-style-type: none"> - Muscle wasting ^{1,3} - Athletic performance ^{1,3} - Hepatic coma ^{1,3} 	500 mg – 5 g ¹	<ul style="list-style-type: none"> - Avoid in hypervalinemia, characterised by headache, irritability, delusions, hallucinations and crawling skin sensation. ¹