

Notes from first paper Hall and Trojian

- Abstract
 - .03g/kg per day
 - Loading dose not necessary to increase intramuscular stores
 - Other forms, specifically creatine ethyl ester, have not shown added benefits
 - Most adverse effect is transient water retention in early stages of supplementation
- Biochemistry
 - Adding other supplements may benefit
 - Whey protein, dextrose, beta-alanine
- Effects of Creatinine on Performance
 - Significant evidence for increase in short duration, maximum-intensity resistance training.
 - Increase in body mass may be due to increased water retention early in loading
 - No evidence on affecting protein synthesis
 - No shown effect on sprinting, swimming, or agility
- Side Effects of Creatinine
 - No evidence of side effects or adverse effects when used appropriately.
 - One case of a 20 year old man with interstitial nephritis. Was taking 20g a day for 4 weeks
 - Reports of young healthy individuals developing acute liver failure while large doses of creatine were among other supplements.
 - When in isolation, no adverse effects from creatine
 - Transient asymptomatic increases in compartment pressures when compared with a placebo.
- Conclusions
 - It can augment short-duration, maximum-intensity resistance training.

Notes on second source Gualano et al

- Introduction
 - Creatine induced mass increase is not exclusively water retention
- Effects on muscle disorders
 - Capable of inducing strength and lean mass gain in patients with dystrophy, mainly dystrophinopathies and myotonic dystrophy type II
 - Aggravated pain in patients with glycogenosis type V (McArdle disease)
 - Patients with inflammatory myopathy who were weak after conventional treatment and supplemented with creatine for 6 months showed greater muscle function than their counterparts
 - It is hard to get large samples in study due to rarity of these diseases
- Creatine effects on bone and cartilage
 - Young patients with Duchenne dystrophy showed increased BMD +3% and reduced bone resorption -30%
 - Elderly male patients with resistance training show reduced muscle protein degradation and bone resorption
- Creatine effects on CNS
 - Supplementation enhanced cerebral oxidation, which partially explains reduced mental fatigue after a mathematical calculus sequence
 - Shown patients with disorders related to anxiety have reduced brain creatine content
 - Creatine supplementation seems to be effective at relieving symptoms, attenuating depression, and improving sleep quality in individuals with PTSD
 - Benefits in individuals with depression and fibromyalgia
 - No improvement for patients with schizophrenia.
- Other therapeutic effects of creatine
 - Marked improvement in elderly who supplement creatine and exercise vs only exercise.
 - Creatine supplementation promotes bone mineral density
- Conclusions
 - It's safe to supplement creatine unless otherwise noted

Notes on Paper number 3 H Kim et al

- Abstract
 - Doubtful allegations against creatine through media and publications
 - Cramps and gastrointestinal complaints is not necessarily linked directly to creatine
 - no change in [kidney] functionality in healthy subjects supplemented with creatine, even during several months, in both young and older populations
- Introduction
 - Lots of uncertainty and lack of data in early 2000's
- Muscle cramp incidences
 - Cramping most likely due to imbalance of electrolytes in muscle
 - Athletes taking 15.75g/day for 28 days, no cramping
 - Hydrate
- Gastrointestinal complaints
 - Lack of support in scientific literature
 - 40g/day creatine and 400mg/day caffeine
 - No disturbances in a study with 20g a day
 - Keep single servings below 10g
 - Make sure to completely dissolve before ingestion
- Liver dysfunctions
 - No statistical evidence using different combinations of dosage and duration
 - Mice and rats show negative effects that are unique to them and not present in humans
- Muscle fibre rupture
 - No supporting evidence that could be differentiated from soreness and damage due to exercise.
- Kidney impairments
 - First study on creatine in 1926 found increase excretion of creatinine and positive nitrogen balance
 - Increase in body mass likely attributed to water retention. Creatine appears to be absorbed in intestines... 40-72% of original load excreted
 - No statistical differences in control group vs 20g/day for 5 days and 10g/day or less thereafter.

- Values remain normal for clinically normal populations up to several years of creatine monohydrate
- Human nephropathies
 - 25 year old soccer player taking cyclosporin, a certified nephrotoxic drug
 - Patient taking 20g/day for 4 weeks
 - Three other individuals did not disclose amounts or other suspected substance use
 - Long term use over 310 days at 10g/day did not show any signs in patients with neurodegenerative disease.
- Conclusion
 - High dose creatine supplementations should not be used by those with preexisting renal disease or risk.

1. Hall, M., & Trojian, T. H. (2013). Creatine supplementation. *Current Sports Medicine Reports*, 12(4), 240-244. doi:10.1249/jsr.0b013e31829cdff2
2. Gualano, Artioli, Poortmans, Lancha Jr. (2010). Exploring the therapeutic role of creatine supplementation. *Amino Acids*, 38:31-44. doi: 10.1007/s00726-009-0263-6
3. H Kim, C. Kim, Carpentier, Poortmans. (2011) Studies on the safety of creatine supplementation. *Amino Acids*, 40:1409-1418. Doi: 10.1007/s00726-011-0878-2