

# The Effects of Creatine Supplements on Fitness

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## Abstract

About 95 percent of the human body's creatine is found in the skeletal muscle wherein short term, high intensity activity continues fatigue in humans is the skeletal muscles failure to maintain a high rate of anaerobic ATP production from phosphocreatine hydrolysis. The research was obtained by searching for peer reviewed articles on creatine from legitimate websites, such as Medline Plus provided by the National Library of medicine and NIH. The conclusion of my research is those creatines supplements can be a natural performance enhancing supplement in short term, high intense activities. Only in those activities does the availability of phosphocreatine have a benefit. The availability and function of phosphocreatine differs during three circumstances: a single bout of exercise, a recovery phase, and repeated bouts of exercise. With creatine usage you potentially can damage your kidneys and liver.

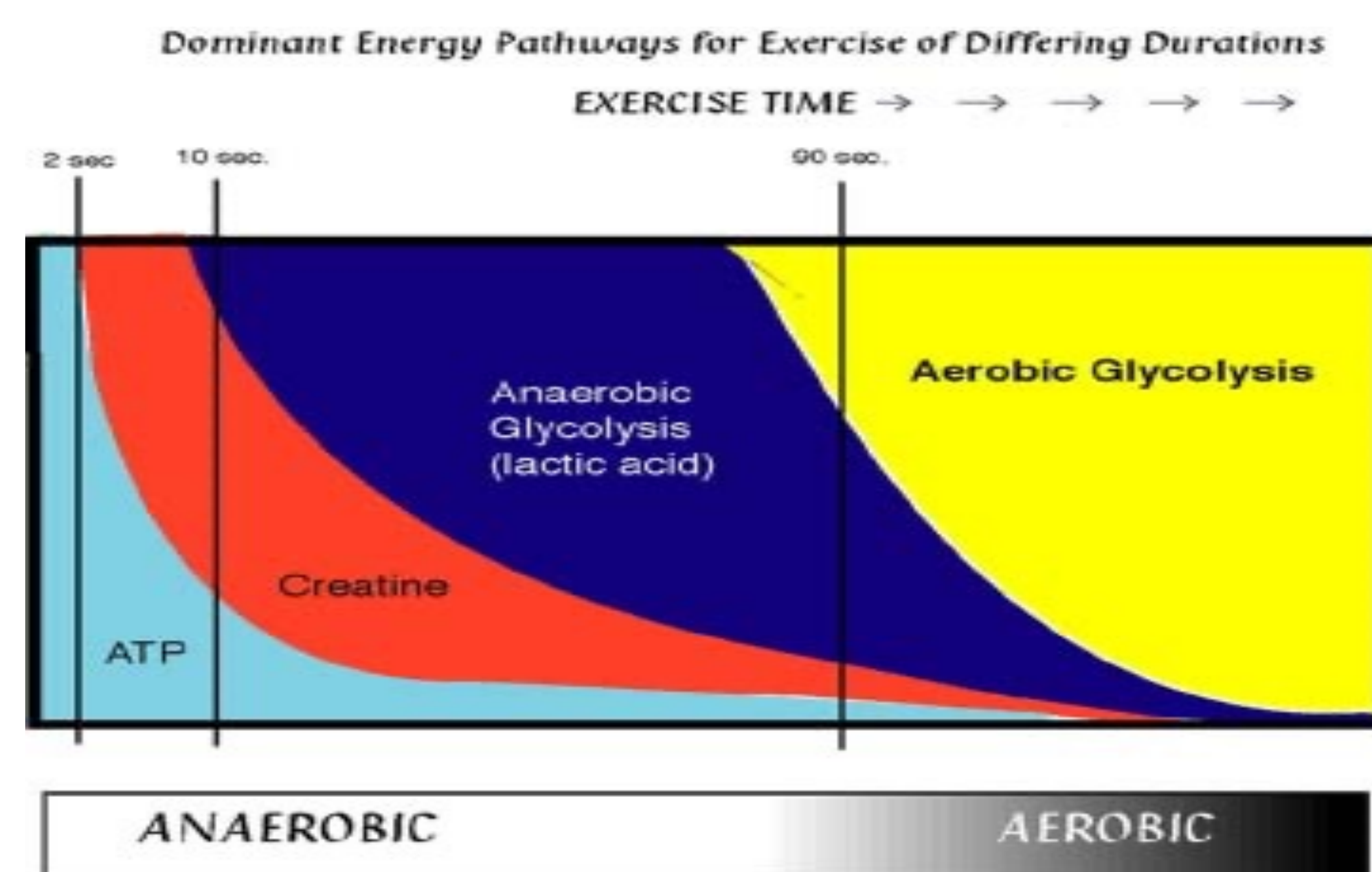
## Introduction

The media has paid attention to athletes and their consumption of creatine. The media advertises that to increase performance, athletes should take creatine supplements. Because of the advertised effects of creatine, lots of athletes use different products to become the best athletes they can. 14 million dollars is spent a year on creatine supplements alone.(6)

Creatine has a significant role when we exercise, by helping produce ATP when we are fatigued. Creatine is a nitrogenous organic acid that occurs naturally in vertebrates and helps to supply energy to muscles. Creatine supplementation is based on an aspect of human energy metabolism known as the creatine phosphate energy shuttle. Your body's common "energy currency" is a molecule called adenosine triphosphate (or ATP for short). It is basically an adenosine molecule with 3 phosphates attached.(5) You use ATP to fuel virtually all of your body's cellular processes, including exercise. When humans exercise in a high-intensity activity, fatigue will set in and cause the skeletal muscles to be unable to produce ATP at a sufficient level to maintain the intensity of the performance. Your body metabolizes food such as carbohydrates, fats, and proteins to make ATP. Under the initial demands of a high intense exercise, when you burn a lot of ATP very quickly, your body can make small amounts of ATP by transferring a phosphate ion from a molecule called creatine phosphate onto an adenosine di-phosphate (ADP). Taking a creatine supplement is thought to give you more creatine in your body that you will make into creatine phosphate therefore may allow you to have more energy.

Do creatine supplements increase the level of creatine in muscles, and does that consumption enhance performance of humans? If creatine does improve the performance of humans, are there any side effects of increasing the levels of creatine in a human's body? Does prolonged consumption of creatine lead to hazardous side effects? My hypotheses are that creatine supplements improve the immediate performance of athletes but have hazardous side effects.

Figure 1: The energy source for muscles is dependent on the availability of oxygen



## Method

This information was obtained through peer-reviewed articles, and other internet sources.

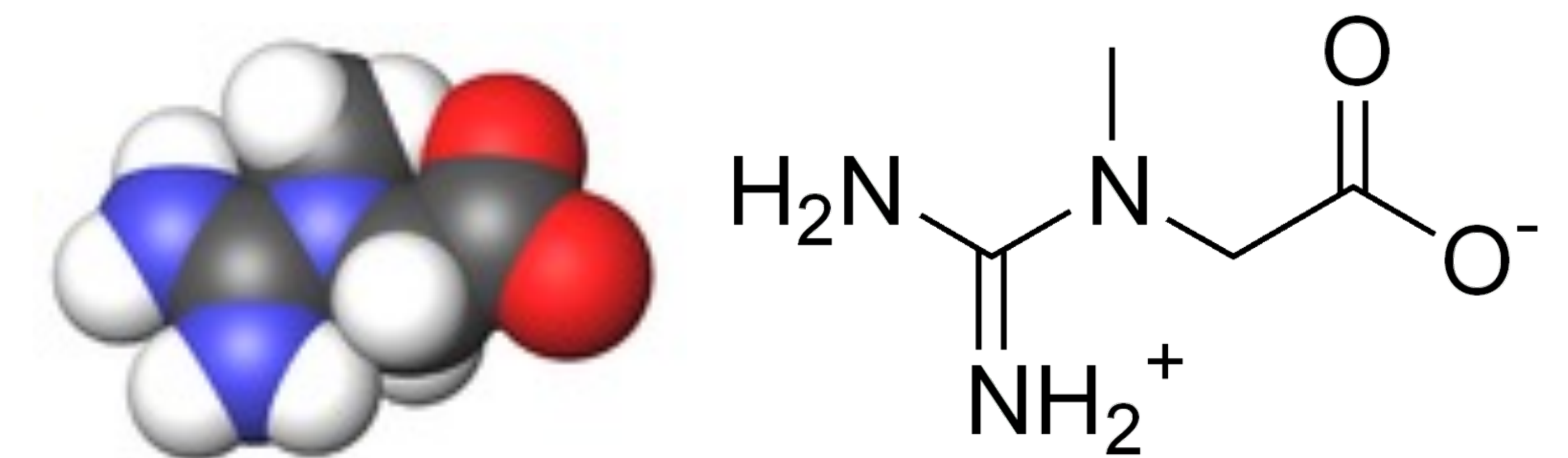
## Results

Is creatine a beneficial supplement to consume during exercise? According to my research creatine plays a vital role in anaerobic exercises.(2) The first published investigation on the effect of creatine supplementation was directed by Anna Casey and Paul Greenhaff. Ingestion of creatine at a rate of 20g/day for 5 days was found to improve performance during repeated bouts of maximal, isokinetic knee extensor exercise; fatigue decreased by 6%.(4) Creatine supplementation affords a legal and scientifically proven means of improving performance during high intensity. Potentially could benefit many sports with many bouts of high intensity such as football, hockey, soccer, and sprinting.(4) Creatine should not be used by endurance athletes because research by Dr. Mark Jenkins shows that those athletes did not benefit from creatine in a 6km course. Instead they became less efficient because of the initial weight gain from creatine.(2) There are side effects that may occur when using creatine supplements. According to Medline Plus creatine may affect liver function and should be used cautiously.(1) A former creatine user from the Houston Astros suffered side effects such as kidney damage, kidney stones, and dehydration.(2) In 1998 an investigation of what role creatine had in the death of three colligate wrestlers.(2) Nausia, heat illness, and muscle cramps may occur when using creatine according to three of my sources.(1,2,3) Prolong creatine use can lead to compartment syndrome of the lower leg, which are blood clots.(1)

## Discussion

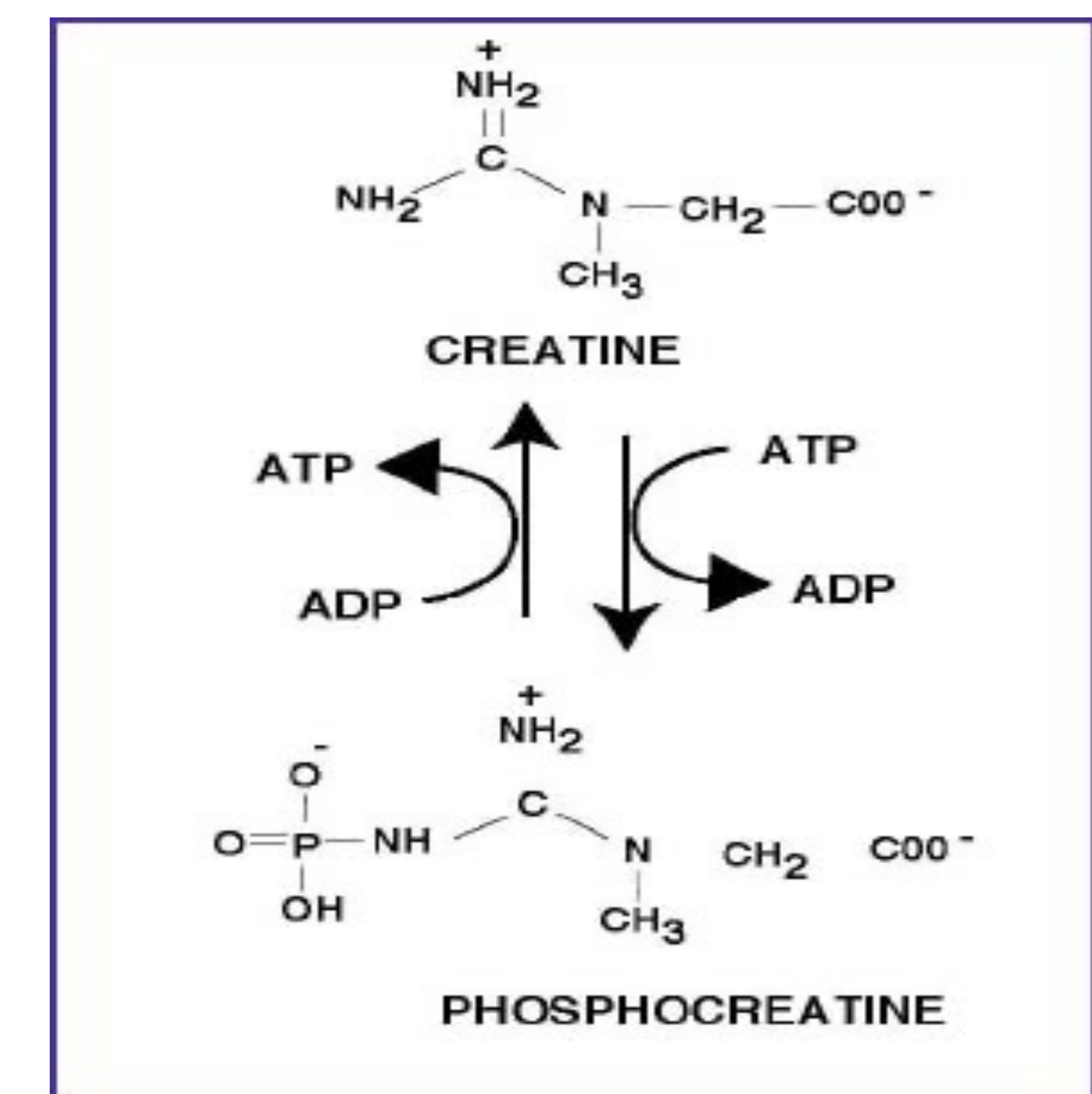
Currently creatine is a legal and scientifically proven supplement to increase ones performance in high intense, short term exercises. It helps in high intense exersices which is the mass building stage of your workout. There is no evidence that suggest creatine supplementation can benefit prolonged exercise, submaximal exercise, such as long distance running. Creatine also comes with lots of side effects. My hypothesis was correct according to my sources, creatine may improve an individual's performance in certain activities but does come with consequences. Creatine may help in the short run with performance, but is it worth the risk?

Figure 2: The structure of Creatine



Source:<http://en.wikipedia.org/wiki/Creatine>

Figure 3: Creatine stores energy from ATP as Phosphocreatine



Source:<http://www.rice.edu/~jenky/sports/creatine.html>

## References

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