Creatine and Diving: Is it Good for You?

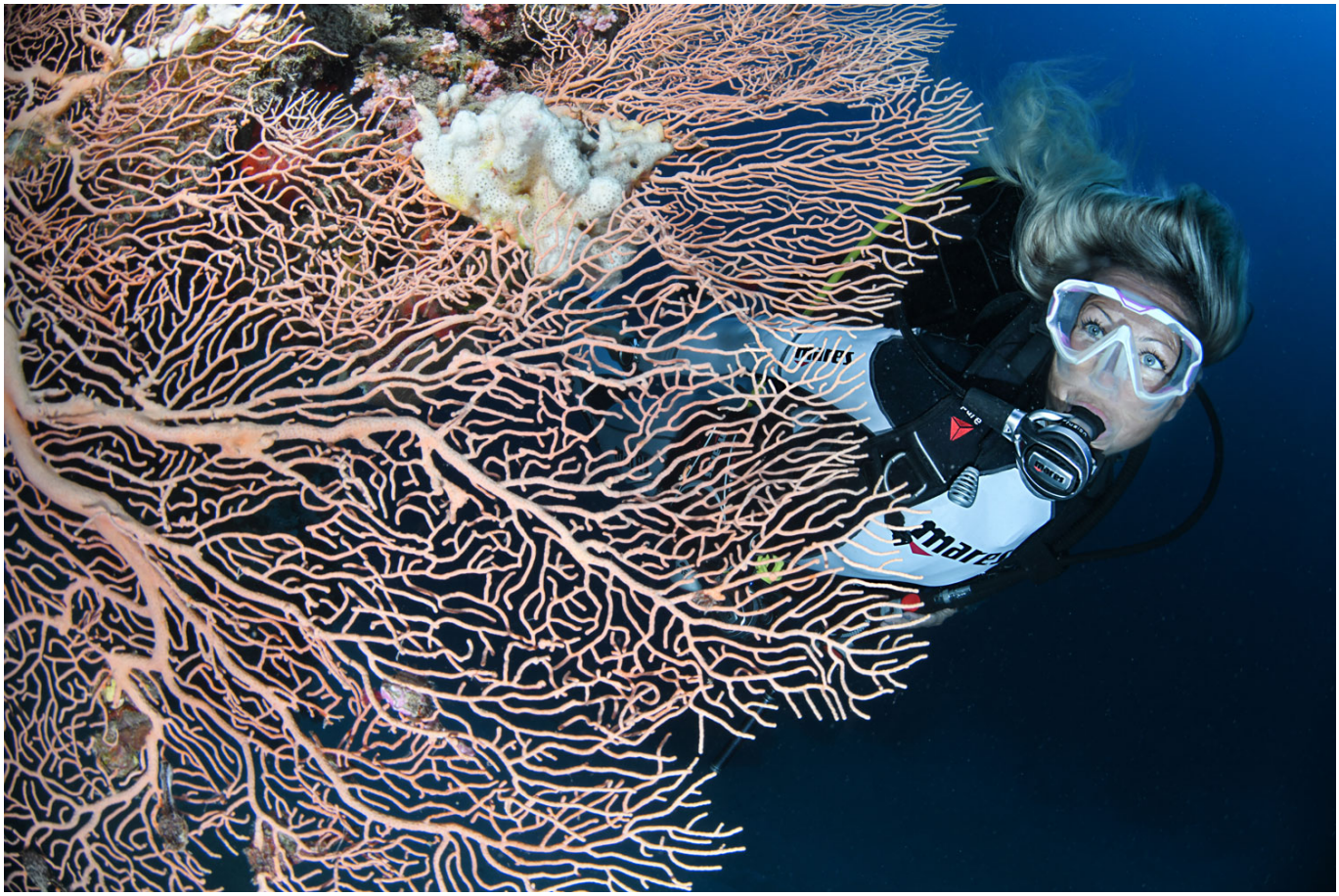
Creatine is a very popular supplement among fitness enthusiasts, bodybuilders and competitive athletes. Yet is it safe to take creatine while diving? Or can it even be beneficial? Let's take a look at the science and find out:

What does creatine do?

Creatine is an intermediate energy storage medium for your body's cells. The energy used by many physiological processes, including muscle contraction, comes from a molecule called adenosine triphosphate, or ATP. In terms of biochemistry, it is the breakdown of high-energy phosphate bonds where the energy to power the movement of your muscle fibers comes from. Creatine helps with replenishing the body's ATP stores, which is why many gym enthusiasts swear by it.

Some amount of creatine is naturally present in your body. However, supplementing creatine on the order of 5 grams per day has been shown to improve athletic performance. This is especially true for strength sports.

While I am not Odin's gift to strength sports, I have personally competed in powerlifting and strongman on a regional level, without winning but without embarrassing myself either. I have consumed creatine on and off for the past 20 years. There appear to be no long-term detrimental effects from taking it, it's cheap, safe, and effective – at least on land. But, is it also safe for scuba diving? Or even beneficial?



Creatine and scuba

There are two areas where the effects of creatine might interfere – positively or negatively – with the demands of scuba diving. One is hydration, a crucial topic in diving physiology. The other one, the understanding of which is relatively new, is brain health. I'll briefly outline the state of science on both of these issues and then give my interpretation as to what it means for a diver:

Hydration

Proper hydration is crucial for divers: When diving dehydrated, unpleasant things like leg cramps can happen. Also, very unpleasant things like decompression illness are more likely to happen.

Bodybuilding lore has it that creatine users need to drink much more, and that creatine binds a lot of water in the tissues. But is that even true? Does it influence one's fluid balance, and by extension, one's ability to deal with heat (which is compromised when dehydrated)? These would be serious issues for diving.

As a supplement, creatine became popular in the late 90s. In subsequent years, exercise scientists published a number of studies about its effects, including effects on hydration and body temperature.

Creatine does in fact at first increase the amount of water held in an athlete's body (Powers et al., 2003). This explains the initial weight gain experienced by many who start using creatine. However, the body then remains in this new state of holding more water, and no continued, additional fluid intake is necessary once an athlete is "creatine loaded." Interestingly, the ratio between water contained inside and outside of the muscle cells is not changed by taking creatine.

Creatine could therefore affect thermoregulation two possible ways: Either the increased amount of water held in a creatine consumer's body is helpful by providing more liquid for sweating, or the tendency of creatine to bind water limits the availability of water to form sweat. But which one is it? Scientists have conducted a number of experiments to find out.



A review article (a scientific article summarizing multiple existing studies) by Rebecca Lopez and colleagues in 2009 synthesized a lot of this work. The ten studies they summarized investigate a variety of physiological parameters like core temperature, sweat loss, hydration status, as well as extracellular and intracellular water. The research looked at triathletes, generally fit people, both male and female. The researchers concluded that “no evidence supports the concept that creatine supplementation hinders the body’s ability to dissipate heat or negatively affects the athlete’s fluid balance.”

A review article from 2014 by Sobolewski and colleagues looks at an expanded pool of studies investigating the effects of creatine on heat and thermoregulation in a variety of athletes, from high-school football players to adult powerlifters. Synthesizing these insights, the researchers find that creatine, if anything, might have a small positive effect on thermoregulation. They conclude that “creatine supplementation does not present additional heat risk or hinder thermoregulation and may actually aid in thermoregulation during hot and humid conditions.” Hot and humid conditions – that is where a lot of scuba diving takes place.

Sadly, there does *not* appear to be any study investigating the effects of creatine on scuba divers specifically.

What this means for divers: Taking creatine appears to have no effect on your body’s fluid balance or ability to cope with heat. There is nothing to worry about beyond the usual concerns about staying hydrated when diving.

Creatine and the brain

It turns out extra creatine doesn’t just power up a human’s skeletal muscle, but the brain as well. Not a

surprise: brains are very energy-intensive organs. Recent science has shown that taking in extra creatine can have beneficial effects on various aspects of brain function. This is an active, developing field, outlined in three recent reviews (Roschel; Forbes; and Furtak, and colleagues each, 2021, 2022, 2025).

In principle, supplementing creatine can help when the brain lacks the substance, either due to a disease like depression or Alzheimer's, or due to heavy exercise or sleep deprivation in healthy humans.

However, there are a few crucial differences between creatine supplement uptake in the muscles (easy) and the brain (tricky). The blood-brain barrier, a layer of cells that limits which chemicals can pass from the blood to the brain, might partially exclude it; And, the brain, unlike the muscles, is able to make some creatine by itself. Extra ingested creatine may still improve brain performance. On the other hand, an abundance of creatine in the blood stream could tune down the brain's intrinsic synthesis of creatine in the brain.

A variety of studies has shown improvements in reaction time, short-term memory, and hand-eye coordination in subjects who took extra creatine. Other studies showed better cognitive performance after sleep-deprivation in subjects taking creatine. It's noteworthy that some studies found no positive effects of creatine on cognition, a fact probably related to the aforementioned role of the blood-brain-barrier and the synthesis of creatine in the brain. Hence, while it's unclear what the best doses for achieving cognitive boosting via creatine are (a question that has been largely worked out for muscles), it's clear that the supplement may help your brain perform in some circumstances.

What this means for divers: While it's a good thing that creatine may boost brain function, this isn't something a diver should rely on. Take it as a potential bonus effect of this useful supplement.



Conclusions

Creatine is an excellent supplement for improving athletic performance without negative side effects. If you are an athlete and take creatine, the scientific literature suggests that you can safely continue doing so while diving. There don't appear to be any detrimental effects on hydration or the ability of your body to cope with heat. The positive brain health effects of creatine could also be beneficial underwater.

On the other hand, no one should try to use creatine as a crutch to cope with stress or other mental health problems before a dive! Minor issues, like a lack of focus due to poor sleep, are a reason to skip a diving day and rest, rather than gulping down a spoonful of creatine. A prospective diver struggling with serious mental health issues needs to see a specialized medical doctor before diving. However, the positive mental effects by creatine on healthy humans might certainly come in handy underwater: Maybe, for once, you'll react quick enough to ace that shot of a fast-swimming shark.

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