FITNESS & EXERCISE

What Creatine Can Actually Do

Creatine can add something to resistance training, but its benefits are specific, modest and easy to exaggerate.

The promise is bigger than the powder

You see creatine beside a familiar set of promises: more muscle, better performance, less fat, perhaps even broader health benefits. Some of that story rests on solid research. Some of it stretches findings from one kind of exercise into claims about almost everything your body does.

The useful question is not whether creatine "works." It is what it works for. The clearest answer is resistance training. Reviews find that adding creatine to that kind of training can produce somewhat larger gains in lean body mass than training alone. That does not make the supplement a substitute for lifting. It makes it an addition to work you are already doing.

Creatine also plays a role in cellular metabolism, particularly when cells are under metabolic stress. That helps explain why researchers have studied it in exercise, ageing, injury and disease. But a plausible role in the body is not proof that every product claim will translate into a noticeable benefit for you.

Creatine is a dietary supplement, usually sold in a form taken by mouth. Supplements do not go through the same premarket testing as drugs, and the rules governing their manufacture and distribution are less strict. That distinction matters before you consider what the trials found.

The strongest case is beside the weights

A 2022 systematic review and meta-analysis brought together 35 randomised controlled trials involving 1,192 participants. Across studies with and without exercise, creatine increased lean body mass by an average of 0.68 kilograms. The more revealing result appeared when researchers separated the studies by activity.

When creatine was combined with resistance training, the average additional gain in lean body mass was 1.10 kilograms. Without exercise, the estimated difference was just 0.03 kilograms and was not statistically significant. Mixed exercise did not produce a statistically significant result either. In other words, the supplement's clearest value appeared in a particular setting: resistance training.

A later meta-analysis of 12 studies in adults younger than 50 reached a similar conclusion. Compared with resistance training alone, training plus creatine produced 1.14 kilograms more lean body mass on average. It was also associated with small reductions in body-fat percentage and fat mass. Those findings do not show that creatine independently strips away fat; they describe the added result observed alongside resistance training.

The pattern is consistent enough to be useful without being miraculous. Creatine can add something to resistance training, but the average difference is measured in roughly a kilogram of lean mass, not a wholesale transformation. The training remains the foundation.

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Lean mass is not the whole story

Lean body mass is a broad outcome. It is not identical to directly measured muscle growth. To ask whether muscles themselves became larger, a 2023 review examined trials lasting at least six weeks that used magnetic resonance imaging, computed tomography or ultrasound to measure changes at specific sites.

Across 10 studies and 44 outcomes, creatine combined with resistance training produced a very small advantage over resistance training with a placebo. Analyses suggested small additional increases in upper- and lower-body muscle thickness. That supports a real benefit, but it also puts the scale of that benefit in view.

The research does not suggest that everyone responds in exactly the same way. In the 2022 review, men had a statistically significant increase in lean body mass, while the estimate for women was smaller and not statistically significant. That does not prove creatine cannot help women; it means that this analysis did not establish a clear effect for them.

Age may matter too, although the evidence is not decisive. The review using direct muscle imaging found a small superior benefit in younger compared with older adults, but the credible interval crossed no difference. Group averages can guide expectations. They cannot tell you in advance exactly what will happen in your body.

It does not improve every workout

Creatine is often discussed as though all performance belongs in one bucket. It does not. Evidence cited in a 2023 systematic review supports a benefit for short-term, high-intensity exercise in athletes. The same review asked a different question: does creatine improve endurance performance in trained people?

The researchers pooled 13 placebo-controlled human trials. They found no statistically significant change in endurance performance, and the estimated effect was trivially negative. Removing studies that were unevenly distributed in the analysis did not change the conclusion.

That is an important boundary. Evidence for high-intensity exercise or resistance training should not be repackaged as evidence for better endurance. If your main goal is endurance performance, this review gives you little reason to expect creatine to improve it.

Broader health claims deserve the same discipline. A 2021 systematic review concluded that creatine has several health and potential therapeutic benefits across the lifespan, based partly on its role in cellular metabolism. But this does not turn a supplement into a general treatment. Disease, injury and medical recovery are clinical questions, not invitations to self-prescribe from a promising mechanism.

Take the label to the conversation

If you are considering creatine, start with the unglamorous part: identify the goal. "More muscle while resistance training" fits the strongest evidence here. "Better endurance" does not. A vague hope of better health is too broad to tell you whether the supplement is doing anything useful.

Then remember that the tub in front of you is not automatically identical to the product used in a trial. Supplements sold in shops or online may differ from research products, and what appears on a supplement label may not always match what is inside. Do not exceed the amount recommended on the label.

This becomes a medical question if you take medication, have a medical condition, are pregnant or nursing, are considering creatine for a child, or are preparing for surgery. Supplements can interact with medicines or pose risks in some medical circumstances. Tell your health care provider about every supplement you use rather than treating the powder as separate from your care.

On Monday, write your medicines and other supplements on a medication list, then take that list and the creatine container to your pharmacist or health care provider. Ask whether it fits your health and your actual goal. That step takes two things you can hold: the container and an up-to-date medication list.

Where this comes from

- Dietary Supplements

  MedlinePlus, U.S. National Library of Medicine · https://medlineplus.gov/dietarysupplements.html
- Dietary and Herbal Supplements - NCCIH

  National Center for Complementary and Integrative Health · https://www.nccih.nih.gov/health/dietary-and-herbal-supplements
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- Effects of Creatine Monohydrate on Endurance Performance in a Trained Population: A Systematic Review and Meta-analysis.

  Sports medicine (Auckland, N.Z.), 2023 · https://pubmed.ncbi.nlm.nih.gov/36877404/
- The Effects of Creatine Supplementation Combined with Resistance Training on Regional Measures of Muscle Hypertrophy: A Systematic Review with Meta-Analysis.

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- Creatine in Health and Disease.

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