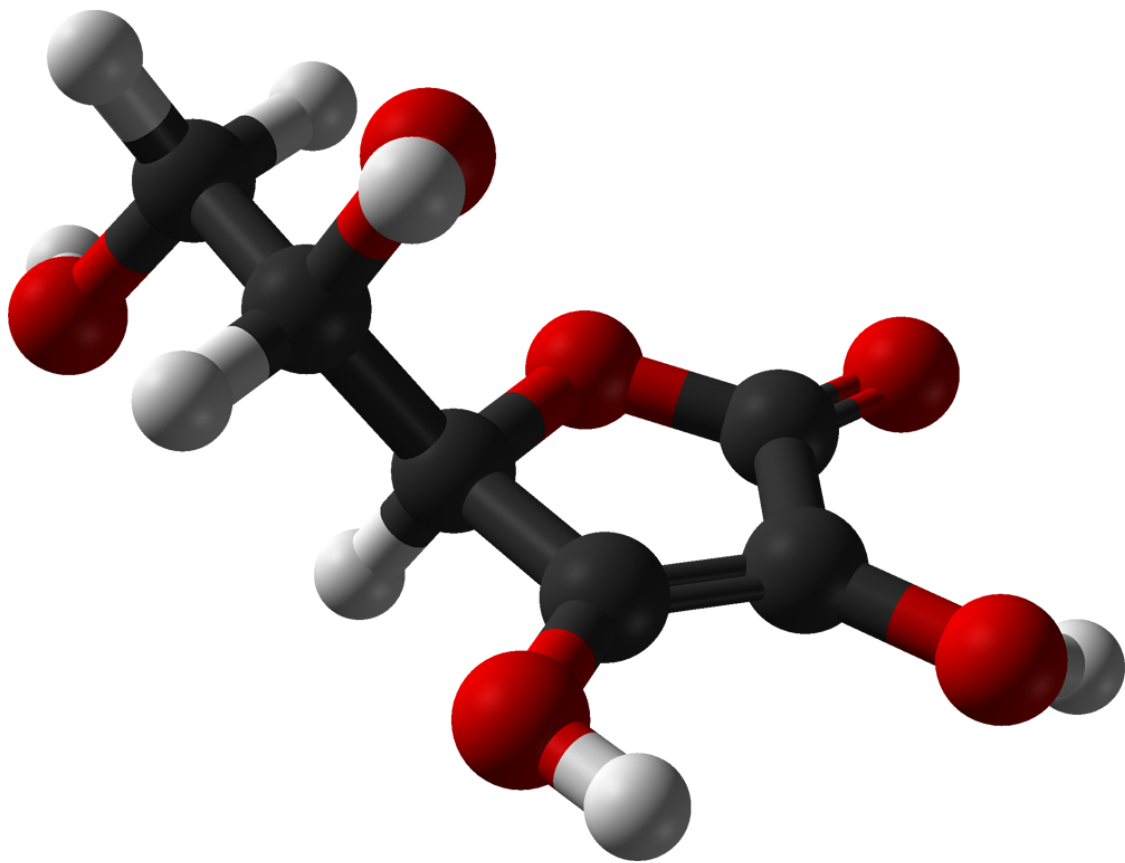


Vitamin C can shorten the length of stay in the ICU

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Ball-and-stick model of the L-ascorbic acid (vitamin C) molecule, $C_6H_8O_6$, as found in the crystal structure. Credit: public domain

Vitamin C administration shortened the length of stay in the intensive care unit on average by 8 percent in 12 trials with 1766 patients according to a meta-analysis published in *Nutrients*.

The biochemistry of [vitamin C](#) is complex. For example, it is involved in the synthesis of norepinephrine and vasopressin, both of which influence the cardiovascular system, and carnitine, which is involved in [energy metabolism](#). Through its epigenetic effects, vitamin C may influence hundreds of genes. In controlled trials, vitamin C has lowered [blood pressure](#), decreased the incidence of atrial fibrillation, decreased bronchoconstriction, decreased pain, decreased [glucose levels](#) in patients with type two diabetes, and it has shortened the duration of colds.

Very low vitamin C plasma levels are not uncommon in hospitals. Furthermore, vitamin C metabolism is changed in many conditions that involve physiological stress, such as infections, surgery, traumas, and burns, in which case vitamin C levels can decline dramatically. Although 0.1 grams per day of vitamin C can maintain a normal plasma level in healthy persons, much higher doses, up to four grams per day, are needed for critically ill patients to increase their plasma vitamin C levels to the range of normal healthy people. Therefore, high vitamin C doses may be needed to compensate for the increased metabolism in critically ill patients.

Given that vitamin C has shown diverse effects on [medical conditions](#), and the accumulated evidence for low vitamin C levels and increased metabolism of vitamin C in critically ill patients, vitamin C might influence practical outcomes such as the length of ICU stay, without any restrictions on the specific medical conditions that cause the stay in the ICU.

Dr. Harri Hemilä from the University of Helsinki, Finland, and Dr. Elizabeth Chalker from the University of Sydney, Australia, carried out

a systematic review of vitamin C for ICU patients. They identified 18 relevant controlled trials, and 12 of them were included in the meta-analysis on the length of stay. On average, vitamin C administration shortened ICU stay by 7.8 percent. In six trials, orally administered vitamin C with an average dose of two grams per day reduced the length of ICU stay on average by 8.6 percent.

According to Hemilä and Chalker, "Vitamin C is a safe, low-cost essential nutrient. Given the consistent evidence from the trials published so far, vitamin C might be administered to ICU patients, although further studies are needed to find out optimal protocols for its administration. A few common cold studies have indicated that there may be a linear dose response for vitamin C on common cold duration for up to six and eight grams per day. Evidently, the dose response for doses higher than two grams per day should also be investigated for ICU [patients](#)."

More information: Vitamin C can shorten the length of stay in the ICU: a meta-analysis. *Nutrients*. doi.org/10.3390/nu11040708

Provided by University of Helsinki

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