Vitamin D3 is a nutrient long known to be essential in maintaining bone health and can be found in low amounts in some seafood and various fortified food products, in addition to normal production via skin exposure to UV radiation. More recently, a large amount of research has demonstrated roles for vitamin D that reach into other aspects of our physiology such as cancer, immune function, skeletal muscle function and neuromuscular diseases. ALS (also known as "Lou Gehrig's disease") is a neuromuscular disorder of the central nervous system that quickly results in severe weakness followed by absolute paralysis of skeletal muscle and death within 3-5 years after the first symptoms have appeared.

Using animals genetically predisposed to develop ALS (G93A transgene mice), we studied the effects of high-dose vitamin D3 (10 fold the adequate intake) as compared to the adequate intake for vitamin D3 which served as the controls. We found significant improvements in the physical functional capacity of mice receiving the high dose of vitamin D3, but no changes in the age at disease onset, duration of disease progression or lifespan. High-dose mice demonstrated a 7% greater paw grip endurance and a 22% greater motor performance score (33% greater within males) vs. the adequate intake. These improvements were in spite of the age at start of dietary intervention (40 d), as well as the fact that the "adequate intake" for mice might already be in considerable excess of what is truly adequate.

Nevertheless, these results could be due to the greater level of neuroprotection as well as a possible increase in skeletal muscle contractile protein synthesis. This is important, because functionality is the central aspect of a disease in which ALS patients very rapidly lose strength and the ability to care for themselves. Future clinical research may demonstrate that high-dose vitamin D therapy slows functional loss and can thus improve quality of life for ALS patients.

Reference: Gianforcaro A, Hamadeh MJ. Dietary vitamin D3 supplementation at 10× the adequate intake improves functional capacity in the G93A transgenic mouse model of ALS, a pilot study. CNS Neurosci Ther. 2012 Jul;18(7):547-57.

View this article [PDF].