

How Nutrition Impacts Muscle Tone

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Many children with developmental delays have low muscle tone or hypotonia because external factors that impact the nervous system can also affect the muscles. Premature birth, heavy antibiotic use and exposure to toxins damage all types of cells and can cause general low tone or just influence specific areas like the hands or mouth. In severe cases of low tone, the muscles can be too weak to help a child sit up straight, chew or push out bowel movements. Milder cases cause fine motor delays or visual processing disorders. All children with hypotonia have reduced stamina.

Symptoms associated with low tone

Reflux- poor trunk tone can allow stomach flaps to flop

Constipation- reduced trunk tone can impede food movement

Fatigue- inefficient processing of nutrients to energy results in less energy

Low arousal- from poor energy availability

Weak chewing and poor eating- low tone in the mouth affects mastication

Drooling- saliva can pool because the mouth is hanging open

Poor eye tracking- weak muscles fail to control and coordinate eye movement

Slumping- soft trunk muscles

What You Eat vs. What You Get

Hypotonia is often described as a neurological problem due to imbalances in the parts of the brain that control tone. While there is a neurological contribution, there is also a nutritional component. Eating well is important, but nutrients must be delivered to the cells and then converted into usable energy. In hypotonia, there is a big gap between what is consumed and cellular nutrition. The muscles, suffering from nutrient deprivation, remain underdeveloped, or if strong, become fatigued easily. Whether a youngster is born with low tone or acquires it through cellular damage, the condition can be improved but the tendency remains.

Improving Energy Management

When a system is inefficient there are three basic strategies to boost output: increase the amount of available materials, enhance the delivery of nutrients and improve the production line. Even a perfect diet will not be enough to correct low tone, but improvement can be achieved with specific extra nutrients. Nutritional therapy for low tone is a long term management plan, not a quick fix.

Increasing available materials

People with hypotonia get tired easily so they tend to prefer sweets and starches as a quick source of energy. Controlling the intake of concentrated sugars (candies, sweetened drinks, desserts) and increasing the amount of protein in the diet is the first step. Protein foods tend to contain more concentrated nutrients while sugary items have calories with few vitamins and minerals. Improving nutrient density is critical because of the expected loss due to inefficient energy production.

Enhance Nutrient Delivery

Carnitine (or specifically, L-carnitine) carries partially digested fat molecules across the mitochondria membrane. The mitochondria is where fats and carbohydrates are converted into adenosine triphosphate (ATP), the cell's main source of energy. Carnitine is a simple protein made up of the amino acids methionine and lysine. Children with severe low tone can have low levels of carnitine in the blood.

Carnitine is usually dosed as the supplement, L-carnitine or L-carnitine fumarate, at 50 to 100mg per kg of body weight. It improves tone in the intestines which is wonderful for constipation but can cause loose stools or stomach distress in some cases. Carnitine as acetyl-L-carnitine is also available as a supplement but this form is more appropriate for brain function and works less well for tone issues.

While carnitine is available in capsules and as a liquid at most health food stores, it has the odd characteristic of also being available by prescription. The prescription version Carnitor, is the L-carnitine type. If your child has low blood carnitine levels, your doctor can recommend the prescription form.

Improve Energy Production

Co-enzyme Q-10 helps regenerate ATP. There is only enough ATP stored in the body to provide energy for about 5-8 seconds of strenuous activity, so it must be constantly regenerated using Co-Q-10. No Co-Q-10: no stamina. The beginning dose of Co Q-10 (also called ubiquinone) is 30-60 mg but can go up to 100mg. Co Q-10 is non-toxic and well tolerated.

Co-enzyme Q-10 works best when it is delivered in an oil base. For children who cannot swallow pills, Solace Nutrition (www.solacenutrition.com) has a Co-Q-10 in a liquid form which is easy to use.

B vitamins are required as co-factors at different points of energy production. Imagine energy production as an assembly line. The workers along the line are the B vitamins. Adding more, is like hiring more laborers

for a slow factory. This is why B vitamins have a reputation for improving energy.

B vitamins should be used as a complex. Youngsters with low tone need a minimum of several times the 100% of the Daily Value listed on vitamin bottles. While B-vitamins are non-toxic, they can make some children cranky, possibly because yeast like them, too. Keep in close contact with your supervising medical professional and adjust the B-vitamins if your child becomes agitated.

Vitamin E helps clean up oxidative damage from inefficient energy production. Free radicals are natural but destructive by-products of metabolism which are produced in much higher amounts when tone is poor. The vitamin E family also protects the fats in cell membranes including the mitochondria membrane, against damage.

There are 8 members of the vitamin E family, 4 tocopherols and 4 tocotrienols. Which member of this family has the highest antioxidant activity is being actively debated. Best to use the entire family. Megafood Complete E 8 is a good choice. Carlson's E Gem Elite also contains the entire spectrum. The insides can be squeezed out. For therapy, most practitioners use between 800-1200 total IUs in children 3 and over.

Improve the quality of your child's diet and add supplements to increase energy efficiency. Low muscle tone can often be managed successfully with the right biochemical support. For specific information on supplements for your child, always confer with a health care professional. These guidelines are for general educational purposes only.