

ANRC Guidelines for Comprehensive Nutritional Support

The Autism Nutrition Center's guidelines are designed to provide optimal nutritional support for most children and adults with autism. It includes a comprehensive set of vitamins, minerals, essential fatty acids, l-carnitine, and a healthy allergen-free diet.

The ANRC Guidelines are based primarily on several major research studies and clinical trials conducted by Prof. James Adams at Arizona State University, as well as studies by many other researchers around the world.

In just 120 days, the ANRC Guidelines will provide comprehensive nutritional support, to maximize brain and body function.

A previous 12 month clinical trial of an earlier version of this set of guidelines found that it resulted in a 7 point increase in non-verbal IQ vs. no change for the control group, and an 18 month increase in developmental age, vs. only 4 months for the control group.

The 4 key parts of the ANRC Guidelines include:

ANRC Essentials: provides comprehensive vitamin and mineral support, as well as several other key anti-oxidants and mitochondrial support

Essential Fatty Acids: provides omega 3 and omega 6 essential fatty acids

L-Carnitine: provides carnitine, a key factor for supporting mitochondrial function (energy production)

Healthy special diet: a diet rich in vegetables, fruit, and protein, and free of gluten, casein, corn, soy, artificial colors/flavors, artificial flavors/colors/preservatives, and excess sugar/junk food.

Note: These general guidelines are not intended as individual medical advice. We advise all families to also discuss these recommendations with their physician and/or nutritionist.

Detailed ANRC Guidelines

Day 1-28: ANRC Essentials: Follow ANRC guidelines for bodyweight and for gradually increase dosage over 4 weeks.

Note that 2-3 months is usually required to observe benefit.

Day 29-42: Essential Fatty Acids: We recommend the following, where each capsule contains approximately 800 mg of omega 3 fatty acids (primarily as EPA).

30–50 pounds (14–23 kg): Day 29-35: 1 capsule/3 times a day;
Day 36 and beyond: 2 capsules/3 times a day

51–100 pounds (23–45 kg): Day 29-33: 1 capsule/3 times a day
Day 34-38 2 capsules/3 times a day
Day 39 and beyond: 3 capsules/3 times a day

100+ pounds (45+ kg): Day 29-32: 1 capsule/3 times a day
Day 33-36: 2 capsules/3 times a day
Day 37-39: 3 capsules/3 times a day
Day 40 and beyond: 4 capsules/3 times a day

We recommend ProEPA Xtra by Nordic Naturals (www.nordicnaturals.com), which contains 820 mg of omega 3 per capsule (mostly EPA), because that is very similar to what we used in our 2018 study. If you want to try other brands, we strongly recommend you smell them to check for rancidity.

Note that it takes about 2 months for blood levels to significantly increase, and about 4 months to reach peak level and provide maximum benefit, so be patient.

Day 43-56: L-Carnitine: Gradually increase dosage over 2 weeks.

Day 43-49: 25 mg/kg bodyweight (so about 750 mg for a 30 kg, or 65 lb, child)

Day 50 and beyond: 50 mg/kg bodyweight (so about 1500 mg for a 30 kg, or 65 lb, child). Maximum of 2 grams.

Note that one study (Fahmy 2013) used 2x this dosage and found even better results.

We recommend L-carnitine instead of acetyl-l-carnitine since we found L-carnitine was better absorbed. Now Foods is one reputable supplier (www.nowfoods.com), and we used their carnitine in our 2018 study.

Carnitine supplementation is most likely to help participants who have low energy or fatigue easily (since carnitine helps make ATP, a primary energy source for the body and brain). It is also most likely to help people who do not regularly consume beef or pork (2-3 servings/week), since the primary source of carnitine in the diet is beef, and somewhat in pork.

Note that about 3 months is required to observe benefit.

Day 57-120: Healthy special diet: Begin with the ANRC Diet Self-Assessment (found on our webpage www.autismnrc.org under the “Nutrition Assessment” tab) to assess current nutritional status, and then work on improving the areas with the lowest scores. The 6 major principles of the diet are:

- 1) High intake of a variety of vegetables (including leafy greens) and some fruit (preferably whole fruit).
- 2) Adequate protein quality and intake.
- 3) Adequate, but not excessive, caloric intake
- 4) Minimal consumption of “junk” foods and replacement with healthy snacks.
- 5) Healthy, gluten-free, casein-free, corn-free, and soy-free (HGCCSF).
- 6) Avoidance of artificial flavors, colors, and preservatives.

Note that it can take 1-3 months to observe benefit from improved diet.

Hints:

In the rare cases that one of these supplements is not tolerated, reduce the dose to a level that is tolerated, or eliminate it.

Evaluate benefits at day 120.

If results are positive, continue all treatments. If you suspect a treatment is not necessary, you can gradually reduce it over 2-4 weeks, and then see if there is any effect due to removing it over the next 1-3 months.

Additional Testing:

If possible, ask your physician to measure levels of iron and vitamin D.

Iron: Iron is not included in ANRC Essentials, because most males do not need extra iron, and excessive iron can be harmful. However, young children under 5 years, females who have reached puberty, and children with “restless leg” syndrome are at greater risk of low iron, and should have their levels checked, and provided with additional iron if needed. Discuss with your physician.

Vitamin D: Vitamin D is primarily obtained by direct sunlight exposure to the skin. Many people do not have adequate exposure to sun, and hence need extra vitamin D. A measurement of your levels of vitamin D levels (25-hydroxyvitamin D). If results are low, discuss additional supplementation with your physician.

Research behind the ANRC Nutrition Guidelines:

The major nutrients that humans need are vitamins, minerals, essential fatty acids, carnitine, and protein. The ANRC guidelines are designed to provide all of those nutrients, at safe and effective levels, to maximize nutritional support and optimize brain and body function.

The ANRC Guidelines are based primarily on the results of the following research studies and clinical trials of children and adults with autism.

You can click on the weblink to learn more about each study.

Comprehensive Study including vitamins, minerals, carnitine, and a healthy special diet

A 12 month clinical trial of an earlier version of the ANRC Guidelines found that it resulted in a 7 point increase in non-verbal IQ vs. no change for the control group, an 18 month increase in developmental age vs. only 4 months for the control group, and many other benefits. The ANRC Guidelines are an improved version of the guidelines used in that study, and we believe it will be even more effective.

Comprehensive Nutritional and Dietary Intervention for Autism Spectrum Disorder – A Randomized, Controlled 12-Month Trial

James B. Adams, Tapan Audhya, Elizabeth Geis, Eva Gehn, Valeria Fimbres, Elena L. Pollard, Jessica Mitchell, Julie Ingram, Robert Hellmers, Dana Laake, Julie S. Matthews, K. Li, Jane C. Naviaux, Robert K. Naviaux, Rebecca L. Adams, Devon M. Coleman, David W. Quig. *Nutrients* 2018, 10(3), 369;

<http://www.mdpi.com/2072-6643/10/3/369>

Vitamins/Minerals:

The latest study (Adams et al 2022) found that 73% of 161 people using ANRC Essentials Plus reported moderate, good, or great benefits. The other papers provide more information on earlier studies of vitamin/mineral supplements for autism.

Vitamin/mineral/micronutrient supplement for autism spectrum disorders: a research survey.

Adams, J. B., Kirby, J., Audhya, T., Whiteley, P., & Bain, J. (2022). *BMC pediatrics*, 22(1), 590.

<https://doi.org/10.1186/s12887-022-03628-0>

Vitamin/Mineral Supplements for Children and Adults with Autism.

Adams JB (2015) *Vitamins Minerals* 3: 127.

<https://www.ncbi.nlm.nih.gov/pubmed/15673999>

Effect of a Vitamin/Mineral Supplement on Children with Autism

Adams JB, Audhya T, Mcdonough-Means S, Rubin RA, Quig D, Geis E, Gehn E, Loresto M, Mitchell J, Atwood S, Barnhouse S, Lee W *BMC Pediatrics* 2011, 11:111

<https://bmcpediatr.biomedcentral.com/articles/10.1186/1471-2431-11-111>

Nutritional and Metabolic Status of Children with Autism vs. Neurotypical Children, and the Association with Autism Severity, Adams JB, Audhya T, Mcdonough-Means S, Rubin RA, Quig D, Geis E, Gehn E, Loresto M, Mitchell J, Atwood S, Barnhouse S, Lee W *Nutr. Metab (Lond)* 2011 Jun 8:8(1):34.

<https://nutritionandmetabolism.biomedcentral.com/articles/10.1186/1743-7075-8-34>

Pilot study of a moderate dose multivitamin/mineral supplement for children with autistic spectrum disorder. Adams JB and Holloway C, *J Altern Complement Med.* 2004 Dec;10(6):1033-9.

Carnitine

Two studies have found that carnitine supplementation is helpful for some children with ASD.

A prospective double-blind, randomized clinical trial of levocarnitine to treat autism spectrum disorders.

Geier DA, Kern JK, Davis G, King PG, Adams JB, Young JL, Geier MR. *Med Sci Monit* 2011 Jun;17(6):PI15-23.

<https://www.medscimonit.com/download/index/idArt/881792>

L-Carnitine supplementation improves the behavioral symptoms in autistic children

Sarah Farid Fahmy, Manal H. El-hamamsy, Osama K. Zaki, Osama A. Badary. *Research in Autism Spectrum Disorders* 7 (2013) 159–166

<https://www.sciencedirect.com/science/article/pii/S1750946712000827>

Essential Fatty Acids

This meta-analysis of many studies found that children with ASD generally benefit from supplementation with fish oil.

Relationship between Long Chain n-3 Polyunsaturated Fatty Acids and Autism Spectrum Disorder: Systematic Review and Meta-Analysis of Case-Control and Randomised Controlled Trials.

Mazahery H, Stonehouse W, Delshad M, Kruger MC, Conlon CA, Beck KL, von Hurst PR. *Nutrients.* 2017 Feb 19;9(2).

<http://www.mdpi.com/2072-6643/9/2/155>