

Minimum Supplement Schedule – Basic, Advanced, Prechelation, and Chelation

Please note: I am giving you “safe ranges” to use as target ranges. These ranges and what I am recommending for your child have been developed by me after interpreting thousands of laboratory tests, prescribing tens of thousands of nutrient protocols, and clinically observing the outcomes for the last 15-20 years. What you see in the first chart below is what I call my “minimum basic” protocol. The reason I call it by that name is because it is a program that I know is safe and one that I know will not cause me to ever have to get up in the middle of the night because something bad has happened because of “overdosing” on supplements.

It is important to note that I am not treating “RDA” values – recommended daily allowances better spelled “wreck-omended” → I’m a wreck and I need mended. In general children on the spectrum are shown repeatedly to have special metabolic needs. Partially this is due to the terrible diet they are eating, often no fault of the parent but eventually enabled as the parent just gives up in frustration after trying to get their child to eat better. Partially it is due to primary or secondary damage to the intestinal tract, one of the problems that result is limited or poor absorption. Partially it is due to the child’s genetic makeup that cannot be changed. And partially it is due to unique biochemical abnormalities, e.g. those known to be present in the methionine/homocysteine-recycling pathway. Each of these problems alone is enough to cause the laboratory data to be abnormal. However, by having two or more of these mechanisms active at the same time results in a synergistic mess, the sum being greater than adding things together or multiplying them together.

You will notice that I have not told you any specific company from which to buy your products. All I have done is give you the ranges that I want for your child and then let you “have at it” from whomever you want to use. There are many good companies. Kirkman Labs has dedicated their company to working with children with autism. Brainchild Nutritionals is a relatively new kid on the block that many parents like to work with. Thorne Research has many products as does Vitamin Research Products. Randy at Hopewell Pharmacy has been a wealth of information and comfort to many of my patients and I recommend him highly. Alan Israel at Lee-Silsby has formulated special products that many parents say taste very good. Tanya through her own company, Logistics Support Systems, has been able to help many of my patients obtain some hard to find products and/or she is able to help them save some money because she set up accounts with various companies, is able to make a little profit while extending parents a discount.

I recommend that each of you use Rick Neubrandner’s Supplement Review Worksheet, a program specifically designed to help you create various program scenarios until you find one that seems to have the fewest pills and the best price. This worksheet program is found on my website at www.dr.neubrandner.com in the download section. After clicking on the link, whenever asked to run or save, always click run. Continue the installation program. Eventually you will be asked for a password which is: reviewit [all lower case and no spaces between the words]. We recommend checking the box that puts a shortcut icon on your desktop. If you forget to do this, once the program is installed you can go to your start button and then to “program files” and look for the program entitled “Supplement Review Worksheet”.

Regarding Safety Concerns: Please note that the ranges shown below are safe ranges and there is nothing that concerns me that you could not exceed the upper limits shown by 33%-50% except possibly selenium and vitamin A. In reality, the increases for these two items is probably safe 99% of the time but I would want to be monitoring these a little more closely so a surprise doesn’t slowly sneak up on us and bite us. Please be aware that the safety margins are very high for everything else shown and you could most likely go up on many of the things several 100% and still “be safe” but you would definitely be generating the famous “expensive urine” so easily talked about by those that don’t understand the benefit or more is better [just not that much more]!

Tips That May Be Helpful:

A kilogram is the weight in pounds divided by 2.2

1 gram = 1000 mg: 1 mg = 1000 mcg

1 tsp = 5 ml: 1 tbs = 15 ml: 1 ounce = 30 cc [really 29.5 cc]

20 drops = 1 cc: 1 cc = 1 ml

“ate” on the end of a word = the same base word followed by “ic acid”; e.g. folate = folic acid; folinate = folinic acid

“BASIC” SUPPLEMENTATION: The nutrients listed directly below should definitely be included in every nutritional program. The ranges shown below are neither conservative nor aggressive and are definitely not toxic. I would prefer that you not go below the recommended ranges. As stated above in the section entitled “Regarding Safety Concerns”, you are safe even if you exceed the upper limits by 33% to 50% with the possible exceptions of vitamin A and selenium.

You will see that some of the nutrients state, “Not Basic but a Preferred Optional”. These nutrients are often needed by children on the spectrum and they are frequently found in “combination products” so I am showing them in both sections, Basic and Advanced/Optional.

Vitamin B6 (pyridoxine or pyridoxal-5-phosphate, P5P) may need to go as high as 4 to 8 mg per pound (up to a maximum dose of 500 mg) due to faulty enzyme kinetics. Therefore, the range you see immediately below for B6 is what I consider to be the “basic range” and not the “faulty enzyme kinetic range” that is necessary for many children on the autistic spectrum.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
[Not Basic But A “Preferred Optional”] Alpha-ketoglutaric acid	Multiply by 0.5	Multiply by 0.75	250-500 mg	Multiply by 1.5	
[Not Basic But A “Preferred Optional”] Beta-carotene	Multiply by 0.5	Multiply by 0.75	10-15,000 IU	Multiply by 1.5	This is the “carotenoid family”, provitamins, vitamin A precursors. No level is unsafe but at very high levels the skin may show a yellow or orange tinge. This is not “liver toxicity” [the whites of the eyes are still white] and is OK.
Biotin	Multiply by 0.5	Multiply by 0.75	500-1000 mcg	Multiply by 1.5	Helps the transsulfuration pathways, a problem most of the children on the spectrum are shown to have
Calcium	Multiply by 0.5	Multiply by 0.8	750-1500 mg	Multiply by 1.5	These doses are safe. Please remember that your calculations for total daily calcium include food and drink sources.
[Not Basic But A “Preferred Optional”] Choline	Multiply by 0.5	Multiply by 0.75	35-65 mg	Multiply by 1.5	Part of neuromuscular chemical transmitters, e.g. acetylcholine, and other key biochemicals, e.g. phosphatidylcholine
Chromium	Multiply by 0.5	Multiply by 0.75	100-200 mcg	Multiply by 1.5	Necessary for good carbohydrate metabolism. Most children on the spectrum predominantly eat carbohydrates.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
[Not Basic But A “Preferred Optional”] Coenzyme Q10	Multiply by 0.5	Multiply by 0.75	50-100 mg	Multiply by 1.5	Also known as “ubiquinone”. It is a powerful antioxidant and protects the heart and brain and many organ systems.
DHA, an omega 3 fatty acid	Multiply by 0.5	Multiply by 0.75	450-600 mg	Multiply by 1.5	DHA and EPA are in cod liver oil and in refined products that just yield DHA and EPA. Small amounts can be made from flaxseeds or flaxoil and hemp oil.
[Not Basic But A “Preferred Optional”] Digestive enzymes	As needed	As needed	As needed	As needed	See description in the Advanced/Optionals section below
EPA, an omega 3 fatty acid	Multiply by 0.5	Multiply by 0.75	600-900 mg	Multiply by 1.5	
Flouride-Free toothpaste: this is preferable for all children on the spectrum. If interested, call my office to make available to you the handouts and links regarding “the rest of the story” about flouride.					
Folic acid	Multiply by 0.5	Multiply by 0.75	150-300 mcg	Multiply by 1.5	This can sometimes help hyperactivity. However, it may make it worse and when folic acid is being used, both won’t hurt but both may not be necessary.
Folinic acid	Multiply by 0.25	Multiply by 0.5	1000-1600 mcg	Multiply by 1.5 to 2.0	
The doctor will usually start folinic acid at the end of the first 5-week clinical trial period of methyl-B12. Folinic acid is an “active” folic acid family member and is necessary to complete other activities folic acid has than to donate methyl groups to eventually form methyl-B12. Remember, the important thing is that folates are very important for many things and we want to make sure we have enough around and we want to make sure we have active forms. In my practice approximately 20% of children cannot handle folinic acid and become hyperactive or more stimmy.					
[Not Basic But A “Preferred Optional”] Glutathione	Glutathione is increased and made active by the use of methyl-B12 in methyl-B12 responders. Therefore I do not always use it for my patients that are doing very well with the methyl-B12 treatment protocol. However, it is definitely a High Priority “preferred optional” that I usually recommend children to try at some point in their treatment. See description in the Advanced/Optionals section below.				
Iron “The ferrous family”	Multiply by 0.5	Multiply by 0.75	8-12 mg	Multiply by 1.5	
Though iron is an oxidant and too many oxidants are not healthy, God and Mother Nature do want us to have “just the right amount”. There is “fear” out there on the Internet making iron “bad” but this is not correct. Children need to have iron to activate many enzyme systems and a serum ferritin level, a test that evaluates the storage form of iron, is a good test to perform in order to convert fear into fact and make the right decision. Based on the thousands of tests I have performed with children on the spectrum, the dose of iron shown above has never caused problems in my experience.					

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Magnesium	Multiply by 0.5	Multiply by 0.75	250-400 mg	Multiply by 1.5	
Magnesium is involved in hundreds of enzymes and is probably one of the most important minerals to calm a child, to decrease stimming and anxiety, and to stop mouthing of objects. In order to accomplish these desirable features, the dose often needs to go double or triple the amount shown above. Because many forms of magnesium can cause diarrhea or loose stools, it is important to stay away from the “extra magnesium” that must be added outside of a multivitamin/mineral preparation that contains things like oxide or hydroxide. You may have to experiment to see which form your child tolerates best. Good forms include chelates, glycinate, aspartate, etc. Children are different so I can give no cookbook recipe for what is best for a specific child.					
Manganese	Multiply by 0.5	Multiply by 0.75	2-6 mg	Multiply by 1.5	Very difficult to absorb and often significantly higher levels are needed to get the blood levels up.
Molybdenum	Multiply by 0.5	Multiply by 0.75	100-300 mcg	Multiply by 1.5	This helps to remove copper, a problem most children have that are on the spectrum.
[Not Basic But A “Preferred Optional”] Probiotics	As needed	As needed	As needed	As needed	See description in the Advanced/Optionals section below
Selenium	Multiply by 0.5	Multiply by 0.75	50-100 mcg	Multiply by 1.5	Monitor or at least discuss it with a physician knowledgeable with this element when greater than 4 mcg/kg.
The conservative range for selenium is 1-4 mcg per kilogram [kilograms = weight in pounds divided by 2.2]. It is important to note that selenium activates one of the key enzymes that recycles glutathione. Selenium has the potential to become toxic at high doses. After evaluating thousands of blood tests, what I find in my practice is that the “safe doses”, e.g. 1-4 mcg/kg are usually not high enough in children on the spectrum to bring their low selenium levels into the normal range.					
Taurine (also known as L-aurine)	Multiply by 0.5	Multiply by 0.75	325-750 mg	Multiply by 1.5	Necessary as an antioxidant, biliary aid, and has neurotransmitter-like functions. It is part of a “spin off” from the homocysteine to glutathione pathway
Vanadium, mineral	Multiply by 0.5	Multiply by 0.75	100-250 mcg	Multiply by 1.5	Similar to chromium it is necessary for good carbohydrate metabolism. Most children on the spectrum predominantly eat carbohydrates.
Vitamin A (palmitate, retinyl, retinol)	Multiply by 0.5	Multiply by 0.75	4000-6000 IU	Multiply by 1.5	This is “true A”, not pre-A or provitamin A derived from carotenoids

True vitamin A has the potential to be toxic but I have only seen it once in my career in a nurse that took a “dropperful” of mycelized vitamin A instead a “drop” of mycelized A. The hype and scare, according to the tens of thousands of nutritional programs I have prescribed over the years is definitely overstated and unfounded. Most children are found to have low vitamin A levels by comprehensive nutritional tests. In addition, 2-day old infants in 3rd world countries are given doses of 200,000 IU plus to prevent measles infections. The levels shown above are not high enough above the RDA values to cause problems unless a child already has an significant underlying liver problem.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Vitamin B1 (thiamin)	Multiply by 0.5	Multiply by 0.75	5-15 mg	Multiply by 1.5	Necessary for brain development. Known for its requirement in liver problems from alcoholism. It is 1/2 of TTFD [the “T” part], a mild chelating agent.
Vitamin B2 (riboflavin)	Multiply by 0.5	Multiply by 0.75	10-20 mg	Multiply by 1.5	Very important also in the regeneration of glutathione.
Vitamin B3 (niacinamide, niacin)	Multiply by 0.5	Multiply by 0.75	25-55 mg	Multiply by 1.5	One of the major vitamins necessary to aid oxidation/reduction reactions in the body [switching the electricity from off to on]. Much more may help at times.
Vitamin B5 (pantothenate, pantothenic acid)	Multiply by 0.5	Multiply by 0.75	30-90 mg	Multiply by 1.5	Part of the energy metabolism cycle
Vitamin B6 (pyridoxine, P5P, pyridoxal phosphate) BASIC RANGE (Advanced/Optional Range discussed in the section below entitled Advanced/Optional)	BASIC RANGE Multiply by 0.5	BASIC RANGE Multiply by 0.75	BASIC RANGE 10-40 mg B6 EUs or B6 PUs	BASIC RANGE Multiply by 1.5	These minimum values may need to be increased significantly as discussed below. Because hyperactivity or increased stimming are not uncommon, I recommend increasing this supplement incrementally and alone after other supplements are in place and the child is “stable”. At times, children on the spectrum do best with up to 8 mg per pound.
Remember that 1 mg of P5P equals approximately 5 mg of pyridoxine; the recommendation above is for “B6 Equivalent Units” or “Pyridoxine Equivalent Units”. According to an unpublished study by Dr. Tapan Audhya, children on the spectrum need up to 21 times the amount of B6 to “push the enzyme reaction to completion”. This is a very important consideration because B6 is involved in numerous critical enzyme reactions. [See VITAMIN B6 ADVANCED/OPTIONAL RANGE in the section below entitled Advanced/Optional]					
Vitamin C (ascorbic acid, ascorbates)	Multiply by 0.5	Multiply by 0.75	500-1000 mg	Multiply by 1.5	Not only important as an antioxidant but also because of the role it plays in recycling glutathione.
Doses double those shown above may be needed at times and can be safely used. The most common side effect is loose stools.					

Vitamin D	Multiply by 0.5	Multiply by 0.75	400-800 IU (is safe) or “Active Vitamin D3” 200 IU (prescription)	400-800 IU (is safe)	
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Important for bone and kidney. The RDA requirements are lower than what you see. However, I put the numbers shown above so that you know that these values “are safe”. The reason I did this is because the amount of vitamin D your child is likely to get in food and from supplements will very quickly exceed the RDA and possibly cause you fear unless you know that these values are well within safety ranges.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Vitamin E (tocopherols)	Multiply by 0.5	Multiply by 0.75	150-300 IU	Multiply by 1.5	
<p>Not only important as an antioxidant but also because of the role it plays in recycling glutathione. Vitamin E levels need to increase in direct proportion to the amount of omega 3 and omega 6 fatty acids that are consumed. It is a very common mistake to jump on the “EPA/DHA or cod liver oil bandwagon” without simultaneously increasing vitamin E. When this happens there is an increase in lipid peroxides. Lipid peroxides are what the lab measures to show that the cell membranes are being chewed up.</p>					
Zinc	Your child’s weigh in pounds	Your child’s weigh in pounds	Your child’s weigh in pounds	Your child’s weigh in pounds	
<p>If the laboratory demonstrates a zinc deficiency, present in about 85% of children on the spectrum; one rule of thumb is 15 to 20 mg over your child’s weight in pounds; another rule of thumb is 2 mg per pound. It is rare for me to see a normal red cell zinc level – usually it is very low normal to low, oftentimes markedly so. At the same time zinc is typically low normal to low in the plasma or serum. Occasionally it can become high in the serum because the amount consumed in the diet (typically little with children on the spectrum) and the amount consumed in supplements cannot leave the serum/plasma and gain entry into the cells. Therefore it builds up and is found to be high when in reality the child really needs more zinc. Zinc is a very stubborn mineral to replete and it is extremely important in numerous enzyme systems and processes, e.g. adequate immune system function, adequate growth and development, absorption, etc.</p>					

“ADVANCED AND/OR OPTIONAL” SUPPLEMENTATION: The nutrients listed below are good to have, may already accompany some of the nutrients shown above if you are using any type of “combination product”, but can be added later if you must prioritize “your basics or beginning program”. They represent a more comprehensive program for specific purposes, e.g. if a child frequently gets sick, you may add the immune system enhancers; if a child has dysbiosis you may add those supplements that support the bowel, etc. Note that I may modify the order of my Basic and my Advanced and/or Optional recommendations if I believe this to be important for your child.

You will see that I make no specific mg or mcg recommendations for many of the items because they are optional or very individualized. In general, when present in a combination product or alone, a safe and conservative dosage range will appear on the container in which it is supplied.

Supplements associated with mg or mcg recommendations are to be used as general guidelines. They are more likely to be included in “combination products” or those supplements that I would like you to think about adding next or for specific reasons.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Carnitine (see L-carnitine)					
Acetylcarnitine (see L-acetylcarnitine)					
Amino acids	Can be based on laboratory test results	See: Plasma amino acids profiles in children with autism: potential risk of nutritional deficiencies. J Autism Dev Disord. 2003 Aug;33(4):449-54.			
The child’s weight divided by 6 is roughly the number of ounces of a “solid animal product” the child needs per day, with 50% of the total preferably eaten at breakfast. If the child has malabsorption, something very common in children on the spectrum, “typical required amounts” may in reality be too little.					
Alpha-ketoglutaric acid	Multiply by 0.5	Multiply by 0.75	250-500 mg	Multiply by 1.5	
Alpha-lipoic acid	Multiply by 0.5	Multiply by 0.75	Use caution!	Multiply by 1.5	
Anthrocyanins from cranberry extract					A good antioxidant enhancer
Arginine (see L-arginine)					
Bacterial control agents	As needed	As needed	As needed	As needed	For preventive reasons you do not need to check with the doctor. For therapeutic reasons to treat symptoms or positive lab results, the doctor should recommend that appropriate first line medications and/or herbal products.

Many herbal products are available and preferable to use as 1st line defense rather than jumping to the “big guns”. However, the doctor may need to take you quickly to something strong and then maintain your child with an herbal substance.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Beta-carotene	Multiply by 0.5	Multiply by 0.75	10-15,000 IU	Multiply by 1.5	This is the “carotenoid family”, provitamins, vitamin A precursors. No level is unsafe but at very high levels the skin may show a yellow or orange tinge. This is not “liver toxicity” [the whites of the eyes are still white] and is OK.
Beta-glucan	Multiply by 0.5	Multiply by 0.75	20-40 mg	Multiply by 1.5	An immune system enhancer.
Boron	Multiply by 0.5	Multiply by 0.75	1-2 mg	Multiply by 1.5	Good for the bones
Choline	Multiply by 0.5	Multiply by 0.75	35-65 mg	Multiply by 1.5	Part of neuromuscular chemical transmitters, e.g. acetylcholine, and other key biochemicals, e.g. phosphatidylcholine
Coenzyme Q10	Multiply by 0.5	Multiply by 0.75	50-100 mg	Multiply by 1.5	Also known as “ubiquinone”. It is a powerful antioxidant and protects the heart and brain and many organ systems.
Copper	Be very careful!	Be very careful!	Be very careful!	Be very careful!	This is very rarely prescribed to children on the spectrum because most do poorly with it.

It is very important to be aware that copper and zinc and molybdenum compete with each other. In addition, one must be very careful to not misread the test results because copper and/or zinc may be low intracellularly in the red cells, etc., but high extracellularly in the serum or plasma.

Digestive enzymes	As needed	As needed	As needed	As needed	
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The majority of children on the autistic spectrum have gastrointestinal issues, either primary or secondary. Many enzyme disorders have been demonstrated and articles about this fact can be found in the peer-reviewed literature. Digestive enzymes “are never wrong” and will never hurt a child. However, an occasional child may become hyperactive or stim more or have abdominal pains when introduced, especially if introduced too quickly or if taken before any food enters the stomach. Therefore, if you decide to use them, add them slowly and when you are making no other changes.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
DMAE	Multiply by 0.5	Multiply by 0.75	30-50 mg	Multiply by 1.5	
This supportive nutritive biochemical is believed by some to be a mild “Ritalin-like” natural agent that may increase focus, attention, eye contact, cognition, and occasionally speech and language. It is something you may like to experiment with when you are making no other simultaneous changes to see if it makes a difference or not in your child.					
DMG	Not needed if on MB12 shots per protocol	See comment below			
Please note that DMG and TMG have both been reported to help improve language. Based on the 50,000 plus methyl-B12 shots that I have prescribed and personally monitored, one of the most significant effects methyl-B12 has is in the area of speech and language. Based on the published research of Dr. Jill James, and based on the biochemical pathways that feed the homocysteine/methionine recycling pathway, it makes sense that these two molecules, both that feed into this pathway, would help speech and language. The “DMG error in thinking” is because DMG feeds through the folic acid pathway to become methylated to form methyl-B12, the final “end product” molecule that must enter the cycle to produce the speech and language. Therefore DMG is really making “a little” methyl-B12 when by giving the shots you are giving “a lot” of methyl-B12. The addition of DMG does not add to how much methyl-B12 there is when the shots are dosed per my protocol. The “TMG error in thinking” is because TMG feeds into the homocysteine/methionine recycling pathway directly but only in the liver and kidney whereas methyl-B12 feeds into the homocysteine/methionine recycling pathway in all the cells in the body. Homocysteine’s “job” is to take one methyl group and now become methionine. Homocysteine cannot receive more than one methyl group at a time – this is an impossibility. Therefore, the methyl group from methyl-B12 is adequate to service all of homocysteine’s needs and the addition of the methyl group from trimethylglycine has “no place to go” if the methyl-B12 dose is adequate as it is per my protocol. Any “extra methyl donors”, e.g. TMG that are just hanging around do nothing more than require a child’s body to process “one more thing” that it now has to get rid of.					
GABA (gamma butyric acid)	Multiply by 0.5	Multiply by 0.75	450-600 mg	Multiply by 1.5	The doctor prescribes this as needed for anxiety and stimming but does not use it as a “regular supplement”
Ginkgo biloba					Good for cerebral blood flow, a potential problem in children on the spectrum, especially in the temporal lobe.
Ginkgo has the longest use and safety record of any herb that has ever been used dating back thousands of years with the Chinese.					

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
GLA, an omega 6 fatty acid	Multiply by 0.5	Multiply by 0.75	260-520 mg but try from plant oils first; see below	Multiply by 1.5	This is the active ingredient in borage oil and evening primrose oil. It can also come from flaxseeds and flaxoil and hemp oil.
<p>Try getting enough in “good” oils from the plant kingdom, e.g. a few teaspoons to a tablespoon or more daily from sunflower, safflower, walnut oil, avocado, etc. Be very careful not to use much canola oil. It is important to note that children on the “standard American diet” [SAD] usually test high normal to high in the desired end product produced by this type of oil, GLA. The reason for this is because fast foods and the foods “in the center of the supermarket” use a lot of vegetable oils in their products. Unfortunately, though the GLA content in the blood is good, there is a price being paid because these foods contain many trans-fatty acids which are very unhealthy types of oils. Warning: One must be cautious of getting healthy without supervision. The reason I say that is because I have seen hundreds of children whose parents “hear the hype” of the omega 3 fatty acids, e.g. in cod liver oil or EPA/DHA capsules and get caught up in the craze of doing one thing right but possibly several things wrong. Frequently I have tested such children to find their EPA and DHA levels now being very high while their GLA level has gone very low [“we cleaned up the diet” – yes, but did not replace what was removed with “the good plant oils to replace the bad ones removed”] and their lipid peroxides have become uncomfortably elevated due to the lack of adding in the necessary vitamin E.</p>					
Glucosamine sulfate	Multiply by 0.5	Multiply by 0.75	200-300 mg	Multiply by 1.5	Possibly helpful if any pains in the joints or muscles or growing pains. I rarely use it in children.
Glutamine (see L-glutamine)					
Glutathione	<p>The value of oral forms in humans primarily helps heal the gut but is very poorly absorbed, if at all. Transdermal forms may be prescribed by the doctor. IV works well but is expensive, invasive, and takes a lot of time and travel. At this time one option parents have is to give a “clinical trial” using liposomal [lipocutical] glutathione available from Wellness Pharmacy (800) 227-2627 and Coastal Compounding Pharmacy (800) 888-9358. This is an oral form that has a definite odor, is being reported to help many children, though approximately 20% of children in my practice cannot tolerate this supplement and will increase stimming, hyperactivity, some even becoming “aggressive or just plain ‘off’”. Very few things are needed more than glutathione for children found to be on the spectrum. Glutathione is very difficult to produce and extremely easy to consume. All the children on the spectrum that were tested by Dr. James were shown to have low glutathione levels. These levels returned to control levels and the ratio of the active to inactive glutathione normalized with methyl-B12 injections per my original protocol.</p>				
<p>Obtain the full reprint for the following article, especially noting the next to the last paragraph where Dr. James makes the statement that autism may be a treatable disorder: James SJ, Cutler P, Melnyk S, Jernigan S, Janak L, Gaylor DW, Neubrandner JA. Metabolic biomarkers of increased oxidative stress and impaired methylation capacity in children with autism. Am. J. Clinical Nutrition, Dec 2004; 80: 1611–1617.</p>					
Glycine (see L-glycine)					
Inositol	Multiply by 0.5	Multiply by 0.75	500-1500 mg	Multiply by 1.5	Can aid sleep

Iodine (mineral)	Rx form is 0.08 mcg/kg/day of the pure “elemental” form	Important for thyroid function. In general, if I use it, I use the “elemental form” by prescription from a compounding pharmacy.			
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Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
L-arginine	Multiply by 0.5	Multiply by 0.75	250-500 mg	Multiply by 1.5	One of the essential amino acids that is often found to be low in children on the spectrum. One of its functions is to help the kidney get rid of ammonia.
L-acetylcarnitine	25-100 mg/kg	25-100 mg/kg	25-100 mg/kg	25-100 mg/kg	See comment below
L-acetylcarnitine is much more expensive than L-carnitine and is probably only needed if L-carnitine cannot be converted by the body into the active form. Therefore, I always recommend trying L-carnitine first.					
L-carnitine	50-100 mg/kg	50-100 mg/kg	50-100 mg/kg	50-100 mg/kg	Very important in getting “good fats” into the mitochondria, the metabolic energy factory of the cell so that “the energy you see” is really “balanced energy” and not energy or metabolism out of control.
L-glycine	Multiply by 0.5	Multiply by 0.75	250-500 mg	Multiply by 1.5	One of the 3 molecules necessary to form glutathione, the other 2 being cysteine and glutamic acid. It is also part of many other important biochemicals, e.g. DMG discussed above.
L-glutamine	Multiply by 0.5	Multiply by 0.75	500-1000 mg	Multiply by 1.5	One of the most important energy sources for the enterocytes, the cells of the intestine. It is necessary for healing of the GI tract.
L-lysine	Multiply by 0.5	Multiply by 0.75	250-500 mg	Multiply by 1.5	This amino acid is necessary “to carry B6”
L-methionine	Be very careful with this	Be very careful with this	Be very careful with this	Be very careful with this	Because Dr. Neubrander believes it is more important “to spin” the methionine/homocysteine recycling pathway than “to load” it, he does not just add methionine [or SAM] because it sounds like a good thing to do. Side effects are not uncommon.

Lithium	Varies according to need – by Rx only	Varies according to need – by Rx only	Varies according to need – by Rx only	Varies according to need – by Rx only	This can be obtained in a “pure elemental form” from a compounding pharmacy with a doctor’s order
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Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Lysine (see L-lysine)					
Melatonin	Multiply by 0.5	Multiply by 0.75	1-3 mg	Multiply by 1.5	A “terminal” antioxidant that does not get recycled
Methionine (see L-methionine)					
N-acetylcysteine (NAC)	Be careful with this orally	Be careful with this orally	Be careful with this orally	Be careful with this orally	A sulfur containing compound that has the ability to feed yeast and bad bacteria if given orally. “A little bit” in a multivitamin usually is not enough to cause too much of a problem
Potassium (mineral)					Only 99 mg is “legal” by the FDA because this mineral can hurt people with heart disease. A banana has about 250 mg of potassium. An adults daily RDA is 2500-3500 mg. If comes from fruits a vegetables and this is the best way to get it into the body!
Probiotics	As needed	As needed	As needed	As needed	Many kinds are available. The SCD complicates this allowing only acidophilus [at the time of this writing]. Children with elevated D-lactate in the urine need a custom probiotic with types of bugs that don’t make much D-lactate, an inflammatory “hot molecule” to a damaged gut lining.
Resveratrol from grape extract					
Silymarin	Multiply by 0.5	Multiply by 0.75	120-240 mg	Multiply by 1.5	
This is the active ingredient in milk thistle and protects from almost all types of liver problems because it “saves” glutathione, a major intracellular antioxidant.					
Sodium, mineral					“Salt” is a valuable element in moderation and should not be the one thing avoided in the “name of health”

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
TMG (the same as betaine)	Not needed if on MB12 shots per protocol	Not needed if on MB12 shots per protocol	Not needed if on MB12 shots per protocol (unless	Not needed if on MB12 shots per protocol	
<p>Please note that DMG and TMG have both been reported to help improve language. Based on the 60,000 plus methyl-B12 shots that I have prescribed and personally monitored, one of the most significant effects methyl-B12 has is in the area of speech and language. Based on the published research of Dr. Jill James, and based on the biochemical pathways that feed the homocysteine/methionine recycling pathway, it makes sense that these two molecules, both that feed into this pathway, would help speech and language. The “DMG error in thinking” is because DMG feeds through the folic acid pathway to become methylated to form methyl-B12, the final “end product” molecule that must enter the cycle to produce the speech and language. Therefore DMG is really making “a little” methyl-B12 when by giving the shots you are giving “a lot” of methyl-B12. The addition of DMG does not add to how much methyl-B12 there is when the shots are dosed per my protocol. The “TMG error in thinking” is because TMG feeds into the homocysteine/methionine recycling pathway directly but only in the liver and kidney whereas methyl-B12 feeds into the homocysteine/methionine recycling pathway in all the cells in the body. Homocysteine’s “job” is to take one methyl group and now become methionine. Homocysteine cannot receive more than one methyl group at a time – this is an impossibility. Therefore, the methyl group from methyl-B12 is adequate to service all of homocysteine’s needs and the addition of the methyl group from trimethylglycine has “no place to go” if the methyl-B12 dose is adequate as it is per my protocol. Any “extra methyl donors”, e.g. TMG that are just hanging around do nothing more than require a child’s body to process “one more thing” that it now has to get rid of.</p>					
Vitamin B6 (pyridoxine, P5P, pyridoxal phosphate) OPTIONAL OR ADVANCED RANGE	OPTIONAL RANGE 4 to 8 mg per pound of B6 EUs or B6 PUs up to a maximum of 250 mg	OPTIONAL RANGE 4 to 8 mg per pound of B6 EUs or B6 PUs up to a maximum of 375 mg	OPTIONAL RANGE 4 to 8 mg per pound of B6 EUs or B6 PUs up to a maximum of 500 mg	OPTIONAL RANGE 4 to 8 mg per pound of B6 EUs or B6 PUs up to a maximum of 500 mg	These minimum values may need to be increased significantly as discussed below. Because hyperactivity or increased stimming are not uncommon, I recommend increasing this supplement incrementally and alone after other supplements are in place and the child is “stable”. At times, children on the spectrum do best with up to 8 mg per pound.
<p>Remember that 1 mg of P5P equals approximately 5 mg of pyridoxine; the recommendation above is for “B6 Equivalent Units” or “Pyridoxine Equivalent Units”. According to an unpublished study by Dr. Tapan Audhya, children on the spectrum need up to 21 times the amount of B6 to “push the enzyme reaction to completion”. This is a very important consideration because B6 is involved in numerous critical enzyme reactions.</p>					

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Vitamin B12 (cyano, hydroxyl, or methyl forms)					
<p>Cyanocobalamin is the form in most vitamins and is more than adequate to take care of most “deficiencies”. As I have said many times, the response that over 90% of my children are getting from methyl-B12 shots in the subcutaneous tissue is due to a dependency. Cyanocobalamin and hydroxycobalamin, a form of B12 found in food, are not powerful enough to form enough methyl-B12 for children on the spectrum. Oral forms of methyl-B12 and transdermal forms have been shown by my research to be far inferior to the subcutaneous injectable form. Please understand it is not that it doesn’t work but rather, how long do you have to play around with a markedly inferior form while your child’s brain is less likely to respond to MB12 shots as s/he gets older?</p>					
Vitamin K					
Yeast control agents	As needed	As needed	As needed	As needed	<p>These agents are good to kill yeast but are more effective in keeping things in check for maintenance after “the big guns”, e.g. major antifungals like Diflucan, Nystatin, etc. have been used to initially clean up the gut to take away most of the yeast body burden.</p>

“CHELATION AND PRECHELATION” SUPPLEMENTATION: During chelation, the nutrients and/or the ranges listed below must be included and are no longer optional. When chelating, your program will include THE BASIC SUPPLEMENTS PLUS THE CHELATION SUPPLEMENT SCHEDULE MODIFICATIONS. You will note that some supplements from your Basic Supplement Schedule will now have increased dosage ranges. Please be sure to make these adjustments.

Nutrient	20-30 lbs	30-40 lbs	40-65 lbs	65-100 lbs	Comments
Boron	Multiply by 0.5	Multiply by 0.75	1-2 mg	Multiply by 1.5	Good for the bones
Chromium	Multiply by 0.5	Multiply by 0.75	200-400 mcg	Multiply by 1.5	
Coenzyme Q10	Multiply by 0.5	Multiply by 0.75	100-150 mg	Multiply by 1.5	
Copper	Copper is needed in the right oxidative state. Too much or too little or “the wrong kind” is a bad situation and therefore keeping “copper just right” means that clinical observations must be weighed against laboratory data. Please note that what is or is not present in the urine does not mean that the oxidative state of copper in the brain is the same. This nutrient is very tricky and needs to be interpreted by a physician familiar with these issues.				
GLA, an omega 6 fatty acid	Multiply by 0.5	Multiply by 0.75	260-520 mg	Multiply by 1.5	
L-taurine	Multiply by 0.5	Multiply by 0.75	600-900 mg	Multiply by 1.5	
Manganese	Multiply by 0.5	Multiply by 0.75	6-10 mg	Multiply by 1.5	
MSM (methylsulfonyl-methane)	Multiply by 0.5	Multiply by 0.75	500-1000 mg	Multiply by 1.5	
Molybdenum	Multiply by 0.5	Multiply by 0.75	250-500 mcg	Multiply by 1.5	
Selenium	Multiply by 0.5	Multiply by 0.75	150-300 mcg	Multiply by 1.5	See comment below.
As discussed above, selenium is “potentially dangerous” but not if monitored every 8-weeks as per Dr. Neubrander’s chelation protocol. “Levels too high” cannot build up that quickly within a 2-month period to cause significant problems so as long as you do the required lab tests to monitor safety, should the amounts be too high, we can reduce them accordingly. It has been my experience that children on the autistic spectrum do not show the same lab value averages that other children do and that it takes more selenium than usual to obtain the desired levels.					
Silymarin	Multiply by 0.5	Multiply by 0.75	120-240 mg	Multiply by 1.5	