



Get Your Essential Brain Nutrients

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What Are the Key Steps Used to Improve Cognitive Function?



- Add brain boosting foods and lower glycemic load
- Meet essential brain nutrient needs
- Add physical and mental fitness
- Proactively manage stress
- Avoid brain toxins
- These have become the five steps in my Better Brain Solution program

To Get You Started Fast, Follow As Many Steps as You Can

- Five steps work better together than only 1-2.
- Several recent studies (e.g. FINGER) have confirmed that combining multiple, diverse lifestyle interventions at once is far more effective than only following one step by itself
- I promise to make following them both fun and simple.

Most Nutrients Come From Eating the Top 12 Foods for Your Brain

1. Green leafy vegetables
2. Other colorful vegetables
3. Omega-3 rich seafood
4. Olive oil and other healthy cooking oils
5. Organic berries and cherries
6. Cocoa and dark chocolate
7. Tea and coffee in moderation
8. Red wine in moderation
9. Nuts
10. Spices and herbs
11. Beans (they have a low glycemic load)
12. Probiotic sources

Meet Your Essential Nutrient Needs

- Vitamin D (at least 2000 IU daily), with a level ~ 50
- Long chain omega-3 fats,,,,, commonly called fish oil (3 servings of omega-3 rich fish, or 1 gram of high-quality fish oil daily)
- A probiotic source (initially 25-50 billion per day); long term at least 5 billion per day
- Magnesium (at least 400 mg daily, preferably a protein bound source, not magnesium oxide)
 - Magnesium L-threonate may have special benefit
- And don't forget, a good quality multivitamin

Vitamin D



- You could get it from sun exposure, but most don't get enough UVB from sun to make sufficient vit D.
- Sunblock blocks vitamin D formation
- Unless you spend your summer in a bathing suit hunting/gathering, you need it as a supplement
- Aim for 2,000 IU daily (up to 5,000 IU daily) until your level is 50-60

Benefits of Vitamin D

- Increases calcium absorption and improves bone health.
- Low vitamin D associated with increased auto-immune rates (eg, multiple sclerosis)
- Associated with better BP control and lower CVD rates.
- Decrease cancer risk by 40-60%
- Essential for brain health

What's in a Good Quality Multivitamin Supplement Plan?

- Adequate vitamin D, >2000 IU daily (ok to add additional vitamin D as needed)
- Adequate vitamin B12, >100 mcg daily
- Mixed folates, not just folic acid
- Protein bound minerals, not mineral salts, like oxides
- Organic copper, or no copper, not inorganic copper
- Mixed forms of vitamin E, include gamma and delta, not just alpha tocopherol.

SOURCES OF OMEGA-3 FATS

LONG CHAIN

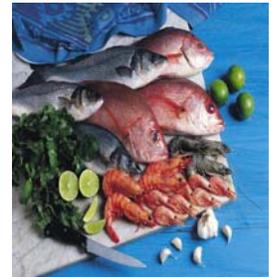
- Seafood and fish oil
- Seaweed supplements

MEDIUM CHAIN (Plant source foods, they are healthy, but they don't have omega-3 known benefits)

- Flax (Ground flax seed better than flax oil)
- Soy products
- Nuts
- Green leafy veggies
- Canola oil (organic, expeller-pressed)

Seafood Sources of Omega-3 Fats

- "Seafood" includes fish, shellfish, and seaweed products
- These provide a rich source of omega-3 fat and are associated with decreased rates for heart disease and better brain function



Food Sources of Long Chain n-3 Fatty Acids

- 1 gram of EPA and DHA consumed with a supplement per day = 2-3 servings of fatty fish per week
- Canned wild Alaskan salmon or canned sardines are the most affordable sources

Balancing High Omega-3 Sources with Low Mercury Content

- **BEST CATCH** (Cold water small mouthed fish, and omega-3 filter feeders from "pristine waters")
 - Salmon, trout, sardines, herring, mussels, oysters
- **GOOD CATCH** (lower fat fish with smaller mouths)
 - Shrimp, crab, and clams, sole, cod, small mahi mahi, halibut (mercury < 2ppm)
- **OCCASIONAL CATCH** (large mouthed fish)
Limit to 2-4 servings/month; (mercury > 2ppm)
 - Blue-fin tuna, grouper, snapper, bass
- **THROW IT BACK** (huge mouthed fish)
 - Swordfish, Kingfish, Shark

Choosing Fish Oil Supplements

- **Dosing:** Look for a dosage of 1000 to 2000 mg of DHA and EPA daily (not total omega-3)
 - Vegetarians take 500 mg of DHA from seaweed
- **Lipid peroxides should be low**
 - Product shouldn't taste or smell highly fishy, to test, stick a needle in the capsule and taste a drop
 - Look for brands that have been 3rd party tested to have low levels of lipid peroxides
 - All the clinical studies have used high quality fish oil; no benefit proven from cheaper, rancid brands

Long Chain Omega-3 Benefits for the ApoE 4 genotype

- People with the ApoE 4 genotype (20% of the population) have higher inflammatory activity, hence, they get infections less often, yet they have greater risk for high cholesterol, heart and Alzheimer's disease
- People with the ApoE4 gene benefit more for omega-3 intake, but require a double dosage for best response.
 - I recommend 2000 mg of DHA and EPA daily

MAGNESIUM

- Magnesium improves muscle cramps and migraines
- Magnesium is good for bone health
- Magnesium improves bowel function (if you don't exceed 500 mg daily)
- Magnesium improves blood sugar control
- Magnesium is involved in >300 anti-aging enzyme processes
- **Low magnesium levels are associated with cardiac arrhythmias and cardiac death**
- **Magnesium improves brain function**

MAGNESIUM

- Commonly deficient in the American diet
 - 70% of people are deficient
 - The hardest of the nutrient needs to meet
- Most of my patients need to take a supplement

Magnesium Sources

- **Good dietary sources include: seeds, nuts, whole grains, green leafy veggies, and legumes**
- **In a supplement, choose magnesium citrate, glycinate, or a protein-bound (malate or Albion chelate) form.**
- **Protein bound forms are best absorbed.**
 - Avoid magnesium oxide, as it causes intestinal distress

Magnesium Content in Food

Food and Portion Size	Magnesium (mg)
Pumpkin and squash seeds, roasted, 1 oz	151
Brazil nuts, 1 oz (1 handful)	107
Oat Bran (100%), 1 oz	103
Halibut, cooked, 3 oz	91
Quinoa, dry, ¼ cup	89
Spinach, frozen, ½ cup	81
Almonds, 1 oz	78
Halibut, 3 oz	78
Swiss chard	76
Cashews, dry roasted, 1 oz	74
Soybeans, mature, cooked, ½ cup	74
Mixed nuts, roasted, with peanuts, 1 oz	67
White beans, canned, ½ cup	67
Black beans, cooked, ½ cup	60
Oat bran, raw, ¼ cup	55
Artichoke hearts, cooked, ½ cup	50
Peanuts, dry roasted, 1 oz	50

Calcium Competes with Magnesium for Absorption

- Calcium supplements block magnesium absorption
- The problem is we lack clinical outcome guidelines for calcium/magnesium supplementation
- Expert opinion recommendation is to use supplements with a 2:1 to 3:1 calcium/magnesium ratio

Special Form of Magnesium, Magnesium L-threonate

- This form of magnesium is reported to achieve better levels in the brain
- A study with 44 people with cognitive decline received Mg-threonate or placebo for 12 weeks, showed modest improvements in brain function
 - They used 1000 mg twice daily (144 mg of elemental magnesium)
 - Unclear if other protein bound magnesium forms (at half the expense) would work as well.

Probiotics

- The GI tract normal contains trillions of healthy bacteria
- There should be more bacteria in the gut than human cells in the body
- Gut bacteria require dietary fiber to thrive!
- **Healthy bacteria**
 - decrease inflammation
 - enhance detoxification
 - metabolize nutrients and drugs
 - promote healthy GI function
 - Help you lose weight

Probiotic Types

- Acidophilus
- Lactobacillus
- Bifidobacteria
- *Saccharomyces Boulardii*
- *More strains (greater diversity) is considered better*
- Minimal dosing is 5 billion daily; I typically use 25-50 billion for Rx

Probiotics and Your Microbiome

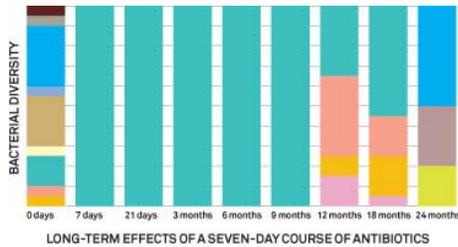
- Your gut microbiome impacts your weight control is a powerful way.
- The ratio of bacteroides (good) /firmicutes (bad) bacteria ratio impacts your weight
- Good bacteria in your gut decreases inflammation, improving calorie burn
- Bad bacteria produce propionic acid, which influences the brain and increases cravings, hunger, and inflammation

What Hurts Your Microbiome?

- Antibiotics
 - Don't take them unless they are essential—like for pneumonia, not for a cold.
 - They can disrupt your gut flora for months.
 - Farmers give cows, pigs, and chickens antibiotics so that they gain weight (like a weight gain pill)
- Gluten and other food intolerances that cause gut inflammation
- Artificial sweeteners
- Lack of dietary fiber

Antibiotics = Microbiome Killers

- Graphed below is the diversity of gut bacteria from (*Bacteroides*) in a patient who took a 7-day course of clindamycin; different colors represent the different species. For nine months after exposure, the subject's gut was left with nothing but one type, a clindamycin-resistant strain of *Bacteroides theta-tau-micron*. Even two years out, the flora had not regained their former diversity.
- Reference: http://www.wired.com/2011/09/mf_microbiome/



Improve Your Microbiome

- Take probiotics
 - Eat fermented foods (yogurt, sauerkraut, kimchi)
 - Take a probiotic supplement with 10-60 billion bacteria daily (1 serving of yogurt has 5 billion live bacteria)
- Trial of an elimination diet (gluten free?)
- Eat at least 30-40 grams of fiber daily (from vegetables, fruits, beans, and nuts)
- Not currently available in the US for weight loss, but what is amazing is that in other countries, fecal transplants work for weight loss

Other Supplements to Consider for Cognitive Support

- Curcumin
- MCT oil
- Resveratrol
- General mitochondrial support

Curcumin

- Potent anti-inflammatory agent, with benefits for arthralgias and DJD, lowering hs-CRP levels
- Being studied for cancer prevention and adjunct cancer Rx
- Being studied for dementia and cognitive decline
- The challenge is obtaining an adequate dosage and having it absorbed (Turmeric curcumin absorption is typically only 2%)

Curcumin for Cognition

- Dr. Katherine Cox, Australian team, randomized 60 healthy adults to 400 mg of well-absorbed curcumin or a placebo
- After only 3 hours, and after 4 weeks, the Rx group receiving curcumin showed improvements in cognitive function.
- Other human studies have shown that curcumin decreased beta amyloid levels, and in mice, enhanced hippocampal neurogenesis, resulting in increased brain size

Mixed results with Curcumin

- Not all the results to date have been favorable, as one 48-week study using a poorly absorbed form of curcumin showed no cognitive benefit, and 21% of the 36 subjects dropped out due to GI side effects
- This emphasizes that curcumin quality really matters
- Aim for 500 to 1000 mg daily

Resveratrol

- Compound normally found in red grapes, about 0.2 to 2 mg per serving (4-5 oz or 150 ml per glass)
 - Most supplement dosages are 100-200 mg daily, thus that would be > 50 glasses of wine
- It initiates some physiological processes similar to fasting (without going hungry)
- Shown to lower inflammation
- It has promising health attributes, yet limited benefits noted for the brain

Resveratrol Studied

- In 1 study with 46 subjects given either a placebo or resveratrol at 200 mg/day for 26 weeks of Rx
- Neuroimaging, blood sugar, and cognitive testing performed pre and post Rx
- Those Rx'd noted better blood sugar control, memory testing, and glucose metabolism in the hippocampus (the memory center)
- More testing clearly needed, but promising

MCT Oil versus Coconut Oil

- MCTs include caprylic acid (8 carbon chains) and capric acid (with 10 carbon chains), as these shorter chains are far better at forming ketones (beta hydroxy butyrate is a 4 carbon chain)
- Coconut oil only has 25% of the shorter MCTs, and is more than 50% lauric acid (12 carbon chains) and provides anti-microbial activity

MCT Oil for Cognitive Decline

- Dr Henderson randomized 152 subjects with cognitive impairment to placebo or MCT oil, initially 10 grams QD, then 20 grams QD x 90 days
 - The intervention group had a clear increase in beta-hydroxybutyrate levels, and an improvement in cognitive function scores.
 - 25% of the intervention group developed diarrhea at this dosage.
 - MCT oil helped the overall Rx group, but in those with ApoE4 genotype, no benefit was noted.
- No clinical studies have to date evaluated MCT oil for cognitive function in normal subjects

Brain Mitochondrial Support

- Several nutrient agents have been shown to boost mitochondrial function and are commonly used together for cognition support:
 - Co-Q-10, alpha lipoic acid, N acetyl cysteine, carnitine, choline
 - Can be combined with herbal agents such as coffee fruit extract and ginkgo
- Although promising, the challenge is that we don't have clinical outcome studies on them, although they are available, such as Brain Vitale by Designs for Health

My Supplement Plan Summary

I have put together a combo with the following DFH products for brain support:

The first three can be obtained individually, or be obtained in a daily pack

- **(2) Twice daily multivitamin**
- **(2) Omega-3 avail with extra vitamin D & K**
- **(1-2) Magnesium malate 180 mg** (or consider magnesium L-threonate, not available in pack form)

Plus add:

- **(1) Probiotic**
- **(1) Curcumin Evail 1000 mg**

5-Step Guide to a Better Brain

- Step 1: Fabulous Foods
- Step 2: Essential Brain Nutrients
- Step 3: Physical and Mental exercises
- Step 4: Stress management
- Step 5: How to avoid brain toxins

Combine as many steps as feasible.