Fueling Brain Vitality

The Role of Nutrition & Supplements

Eva Selhub, MD
You are what you eat.

Show your brain some love!
- Helps you maintain balance and communicate with all parts of the body.
- Able to perform cognitive functions under stress
- Continues to grow new neurons (neurogenesis)
- Manages all organs, muscles, movement, etc.
- Works 24/7
The Magnificent Brain

• It’s a closed system.
• Needs to stay clean.
• Little gets in and less gets out.
• Needs protection from oxidative stress.
• Needs protection from impact.
• Needs high octane fuel to function well.
• Needs support for bio-electrical pathways.
• 60% of your brain is made of fat, needing it to maintain fluidity and integrity
• Has a close relationship with the gut.
The Gut-Brain Connection

- The gut has 500 million neurons which are connected to the brain.
- The gut lining serves as first line of defense.
- 95% of serotonin produced in GI tract.
- The gut digests and absorbs nutrients used as fuel by the brain.
- 70-80% of immune cells are in the gut.
- Gut friendly bacteria directly and indirectly influence the brain.
They Typical Western Diet

- HIGH IN PROCESSED AND ARTIFICIALLY SWEETENED FOODS, RED MEAT, DAIRY PRODUCTS, SUGAR.
- MINIMAL VEGETABLES, FRUITS, FISH AND WHOLE GRAINS.
- ASSOCIATED WITH MORE INflammATION AND OXIDATIVE STRESS, INCLUDING IN THE BRAIN.
- ASSOCIATED WITH MORE MENTAL HEALTH PROBLEMS AND POSSIBLY COGNITIVE DECLINE.
- ASSOCIATED WITH MORE FATIGUE AND PHYSICAL HEALTH PROBLEMS.
Goals!

- Stop/prevent inflammation and oxidative stress
- Support the structure of function of the nervous system
- Amplify the energy sources
- Keep the microbiome happy
- Think nutrient rich
- Go plant based whole foods versus processed
Vitamins like the B vitamins, C, D, and K can help cognition, mood and support other brain functions.

Antioxidants offset inflammation and oxidative stress

Minerals like magnesium, zinc, and potassium

Essential fatty acids for brain structure, mood, and neurotransmitters

Carbohydrates for fuel

Proteins building blocks

Pre and probiotic foods nourish the microbes in the gut
Why Eat Healthy Fats?

• Source of fuel or energy to support your cells.
• Surrounds, supports and protects your cells, organs and brain, including neurons and myelin.
• Help the body absorb other nutrients.
• Help the body produce hormones.
• Help regulate inflammation and blood clotting.
• Needed extra polyunsaturated fatty acids, especially omega-3, some mono-unsaturated fats, less saturated fat and no trans-fats.
B Vitamin Up

- Includes B1, B2, B3, B5, B6, B9 (folate), B12 and Biotin.
- Essential for physiological and neurological functions.
- Produce energy for new brain cells, DNA & RNA synthesis and repair, methylation, synthesis of neurochemicals and signaling molecules, and all aspects of carbon metabolism.
- Promote neuroplasticity and brain adaptability.
- B12 needed for neurotransmitters, cognitive function, memory and focus.
- B6 needed for neurotransmitters, mood regulation and nervous system functions.
- B1 also for neurotransmitters, and synthesis of fatty acids, steroids and nucleic acids.
- Liver, seafood, poultry, eggs, legumes, leafy greens, seeds, nutritional yeast, etc.
Getting the Fat Soluble Vitamins

- **Vitamin A** for regulating neuroplasticity and neurogenesis, especially in the hippocampus (green leafy vegetables, orange & yellow vegetables, cantaloupe, apricots, dairy)

- **Vitamin C** for cognitive performance, neuronal differentiation, neurotransmitter production, and support of myelin sheath (citrus, tomatoes, potatoes, red & green peppers).

- **Vitamin D** for brain cell growth (neuroplasticity), serotonin, preventing inflammation, acts as neurosteroid, and helps with cognitive function (fish, fish oils, egg yolks, mushrooms).

- **Vitamin E** for better brain function, synaptic activity and cognitive function, especially in hippocampus (memory) (green leafy vegetables, red bell pepper, sunflower seeds, pumpkin, almonds).
Antioxidants

- Boost immune system, counteract oxidative stress, & prevent cell damage.
- Protects enzymes, fats and vitamins in the body.
- May reverse memory loss.
- Anthocyanins found in berries associated with delayed cognitive decline.
- Epicatechin found in cocoa associated with preserved cognitive abilities and lowered risk of developing Alzheimer’s Disease.
- Luteolin in tomatoes, lemons and peppers associated with less beta-amyloid.
- Selenium in Brazil nuts, fish, chicken and lentils regulates glutathione, a master antioxidant, supporting memory and cognitive function.
Minerals for the Mind

- Support metabolism, memory, mood and many other brain functions.
- **Zinc** supports cognitive functions, synaptic transmission, and protein structure.
- **Calcium** needed for brain activity and plasticity. Change in calcium release channel may be associated with poor memory.
- **Magnesium** necessary for brain energy, neurotransmission, neurotransmitters, influences BDNF, helps memory and learning.
- **Iron necessary** for make up of proteins and enzymes, development of brain cells and myelin sheath, plays role in learning and memory.
Keeping Microbes Happy

- Protect the GI lining and prevent wear and tear.
- Produce neurochemicals like GABA and influence neurotransmitter production.
- Directly activate of neural pathways between gut and brain.
- Limit inflammatory cytokine production.
- Improves nutritional status like omega 3 FA, minerals, and dietary phytochemicals.
- Limit small intestinal bacterial overgrowth.
- Found in fermented foods (kimchi, souerkraut, kefir, miso, kombucha, yogurt).
- Enjoy feasting on prebiotic fibers (oats, barley, beans, vegetables, fruits and beans).
Cheat Sheet

• **Greens**: (kale, spinach, collards, etc) For vitamins A, B,C, E and K, and folate, minerals & antioxidants.

• **Color**: Antioxidants like flavonoids gives fruits and veggies color, for memory, learning and cognitive performance. (carrots, spinach, grapes etc.), will also be a good source of vitamins.

• **Healthy Fats**: Salmon, trout, herring, sardines, kippers or mackerel, some nuts and seeds for healthy fat to help brain structure and functions.

• **Animal protein**: Protein, amino acids and B vitamins, especially B12, for brain function (lean meat, poultry, fish, etc.)

• **Fiber-rich sources**: Whole grains for energy, minerals, vitamins, and proteins.
Add Instead of Taking Away

• **Limit** sugar and other low fiber carbohydrates, and avoid fried foods, or processed foods.

• **Add** a *variety* of plant-based foods (at least 30), especially colorful fruits & vegetables and whole grains.

• **Add** essential fatty acids like omega-3 fish oils and alpha-linoleic acids.

• **Add** fermented foods.

• **Add** supplements, especially if getting enough real food is challenging
Resources

• Antioxidants https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7582347/
• Dietary fats https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6120115/
• B vitamins https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4772032/
• Vitamin D https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6132681/
• Vitamin C https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2649700/
• Probiotics https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10410452/
• Supplement data base https://ods.od.nih.gov/Research/Dietary_Supplement_Label_Database.aspx
Thank You

Eva Selhub, MD
dreva@drselhub.com
www.drselhub.com