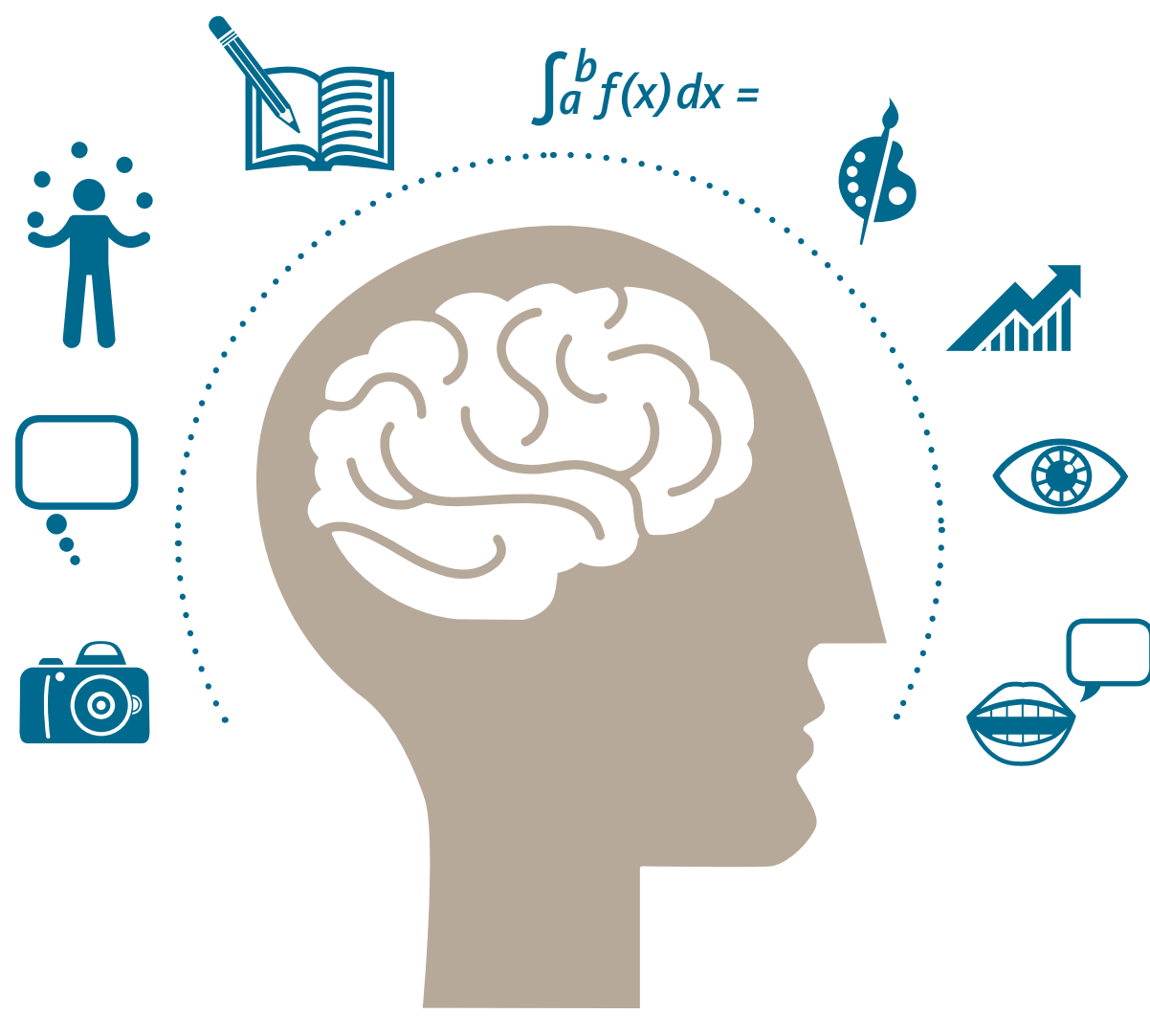


# NUTRITION AND COGNITIVE FUNCTION

Your brain needs good nutrition to support its high metabolic activity and neural functions.

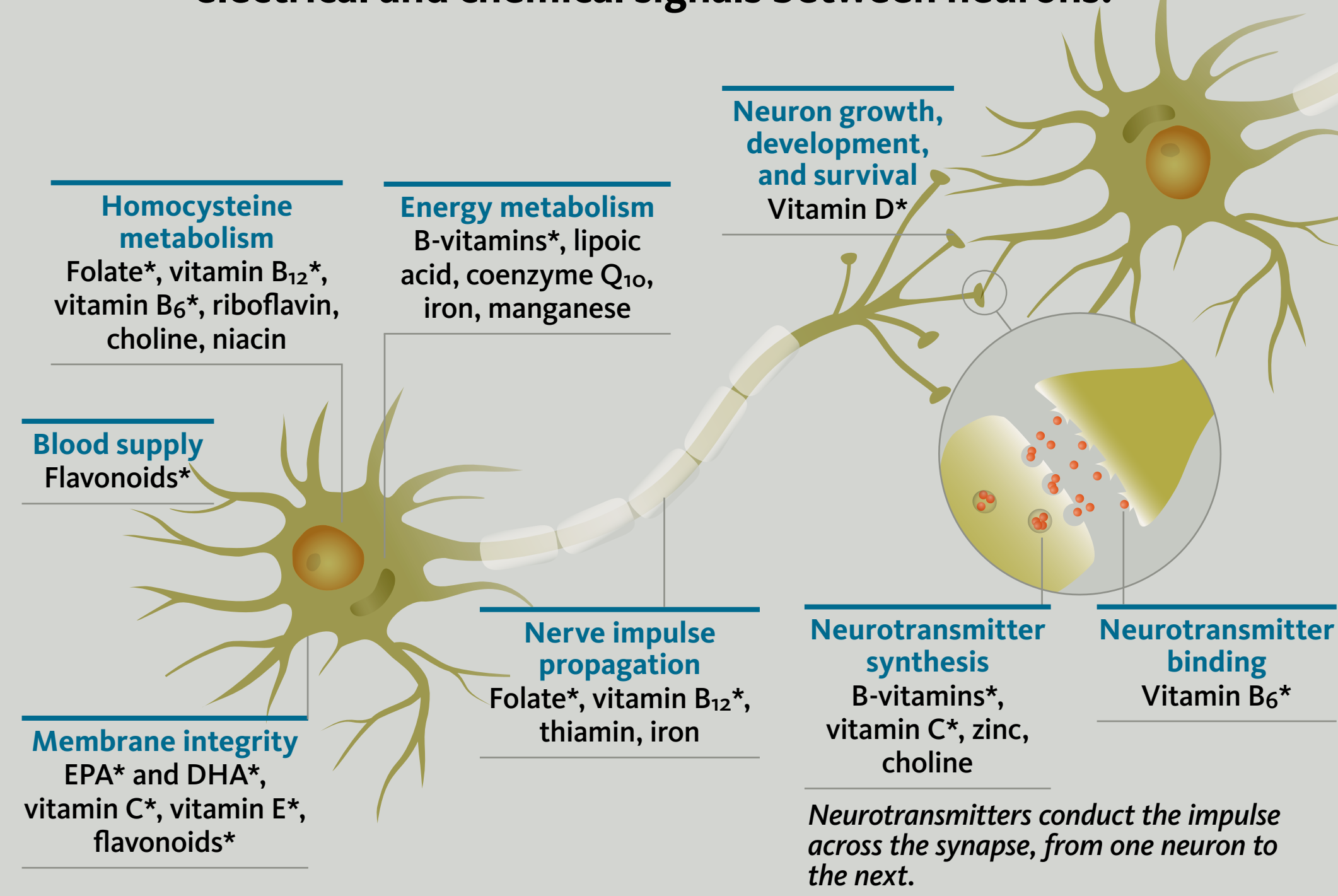
Cognitive function refers to a variety of mental processes, including:

- ATTENTION
- PERCEPTION
- MEMORY
- REASONING
- PLANNING
- PROBLEM SOLVING
- DECISION MAKING
- LANGUAGE
- MULTITASKING



## BASIC NEEDS FOR COGNITIVE FUNCTION

All of our actions are the result of the transmission of electrical and chemical signals between neurons.



\*These nutrients are discussed in more detail below.

## MAINTAINING COGNITIVE FUNCTION

Some decline in cognitive function is part of aging, but there can be different degrees of severity in different individuals.

**Age-related cognitive decline**

The normal decline in various cognitive functions due to aging. Memory is the earliest cognitive function to show decline with increasing age.

- Brain shrinks
- Number of connections between neurons declines
- Number of neurotransmitter receptors decreases

**Mild cognitive impairment**

Noticeable impairment in cognitive function that does not affect instrumental activities of daily living

- Forgetting recent conversations
- Becoming disoriented in familiar places

**Dementia**

A loss of behavioral and cognitive abilities to an extent that interferes with daily life. Symptoms of dementia may include

- Not recognizing family members
- Difficulty with self care
- Difficulty thinking and remembering

- Consuming a healthy diet and getting regular physical activity can help prevent age-related declines in cognitive function.
- In some situations, a supplement may help too. The decision to supplement should be made in conjunction with a qualified healthcare professional.

## IMPORTANT NUTRIENTS

Function	Guidelines and Sources	Take-home Message
<b>LONG-CHAIN OMEGA-3 POLYUNSATURATED FATTY ACIDS (EPA and DHA)</b>		
Nerve cell membranes are very rich in fatty acids, especially the long-chain omega-3 polyunsaturated fatty acid, DHA.	<ul style="list-style-type: none"> <li>Oily fish, e.g., salmon, mackerel, sardines</li> <li>At least 2 servings/week</li> <li>EPA &amp; DHA: At least 500 mg/day</li> </ul>	<ul style="list-style-type: none"> <li>Higher dietary intake of fatty fish is associated with beneficial effects on cognitive function.</li> <li>EPA and DHA supplements may have beneficial effects in individuals with mild cognitive impairment.</li> </ul>
<b>FOLATE, VITAMIN B<sub>12</sub>, AND VITAMIN B<sub>6</sub></b>		
<ul style="list-style-type: none"> <li>These three B-vitamins work together to lower blood homocysteine concentration.</li> <li>Too much homocysteine in the blood has been associated with increased risk of cognitive decline and dementia in older adults.</li> </ul>	<ul style="list-style-type: none"> <li>Folic acid: at most, 1,000 µg/day</li> <li>Vitamin B<sub>12</sub>: 100–400 µg/day</li> <li>Vitamin B<sub>6</sub>: at most, 100 mg/day</li> </ul>	<ul style="list-style-type: none"> <li>In healthy older adults, B-vitamin supplementation lowers homocysteine concentration, but does not improve cognitive function.</li> <li>In those with mild cognitive impairment, B-vitamin supplementation may prevent further cognitive decline.</li> </ul>
<b>VITAMIN C</b>		
<ul style="list-style-type: none"> <li>Neurons in the brain retain high concentrations of vitamin C.</li> <li>Antioxidant nutrients like vitamin C protect nerve cells from damage.</li> </ul>	<ul style="list-style-type: none"> <li>Sweet red pepper, kiwi, strawberries</li> <li>Consume at least 400 mg/day</li> <li>250 mg supplement, twice/day</li> </ul>	Eating a vitamin C-rich diet can have a protective effect against age-related cognitive decline.
<b>VITAMIN D</b>		
Vitamin D influences the growth, development, and survival of neurons.	<ul style="list-style-type: none"> <li>2,000 IU (50 µg) of supplemental vitamin D daily for generally healthy adults.</li> </ul>	Low vitamin D status (serum 25-hydroxyvitamin D below 30 ng/mL [75 nmol/L]) increases the risk of cognitive decline and dementia in older adults.
<b>VITAMIN E</b>		
Vitamin E prevents oxidative damage to lipids and therefore helps protect nerve cell membranes.	<ul style="list-style-type: none"> <li>Almonds, avocado, vegetable oil</li> <li>15 mg/day</li> </ul>	Increased vitamin E intake, through food or supplementation, may protect against cognitive decline in individuals with low dietary intake of vitamin E (less than 6.1 mg/day).
<b>FLAVONOIDS</b>		
Flavonoids may improve blood vessel function and influence the communication between nerve cells.	<ul style="list-style-type: none"> <li>Dark cocoa powder, blueberries</li> </ul>	Daily consumption of flavonoid-rich food and beverages improves cognitive function in healthy older adults and in those with mild cognitive impairment.

g = grams | mg = milligrams | µg = micrograms | ng = nanograms | nmols = nanomoles | IU = International Units | mL = milliliters | L = liters

## PHYSICAL ACTIVITY



- Physical activity increases the number and survival of neurons.
- Physical activity increases the volume of the hippocampus, a region of the brain important for forming new memories.
- Even the aged brain is capable of these improvements. Keep active in order to maintain cognitive function at any age.

### SOURCES

- Micronutrient Information Center: [ipi.oregonstate.edu/mic/health-disease/cognitive-function](http://ipi.oregonstate.edu/mic/health-disease/cognitive-function)
- Best T. and Dye L., Nutrition for Brain Health and Cognitive Performance. New York: CRC Press; 2015.
- BrainFacts.org

