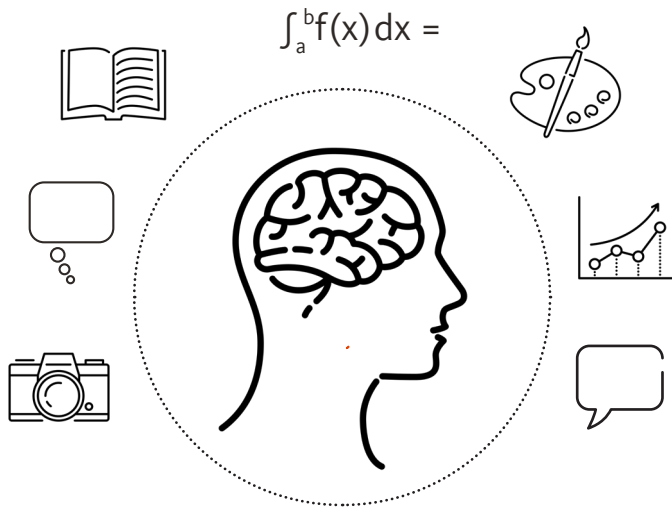


NUTRITION AND COGNITIVE FUNCTION

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
- Language
- Multitasking
- Problem solving
- Decision making

BASIC NEEDS FOR COGNITIVE FUNCTION

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

A Neurotransmitter binding
Vitamin B₆

B Neurotransmitter synthesis
B-vitamins, Vitamin C, Zinc, Choline

C Nerve impulse propagation
Folate, Vitamin B₁₂, Thiamin, Iron

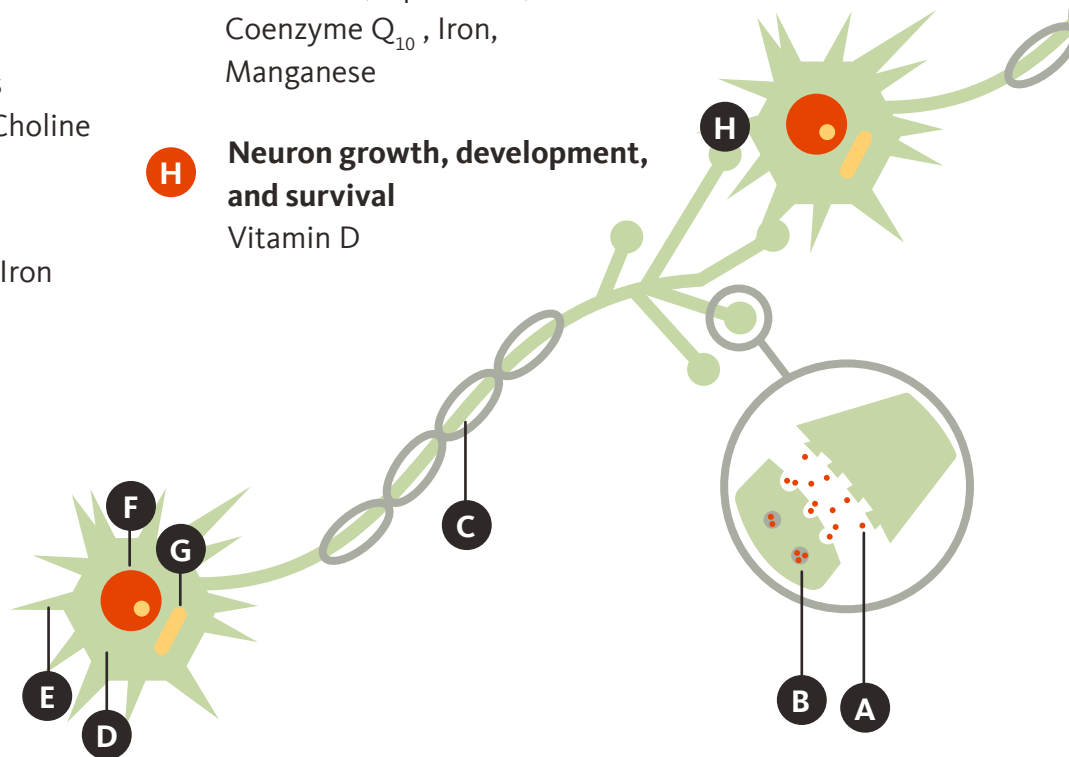
D Membrane integrity
EPA and DHA, Vitamin C, Vitamin E, Flavonoids

E Blood supply
Flavonoids

F Homocysteine metabolism
Folate, Vitamin B₁₂, Vitamin B₆, Riboflavin, Choline, Niacin

G Energy metabolism
B-vitamins, Lipoic Acid, Coenzyme Q₁₀, Iron, Manganese

H Neuron growth, development, and survival
Vitamin D



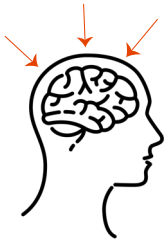
Neurotransmitters conduct the impulse across the synapse, from one neuron to the next.

MAINTAINING COGNITIVE FUNCTION

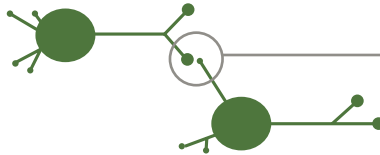
Some decline in cognitive function is part of aging, but different degrees of severity exist among individuals.

AGE-RELATED COGNITIVE DECLINE

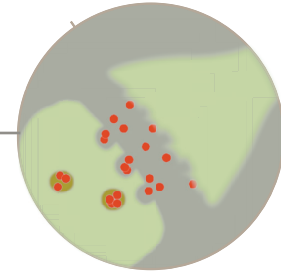
The normal decline in various cognitive functions due to aging. Memory is the earliest cognitive function to show decline with increasing age.



Brain shrinks



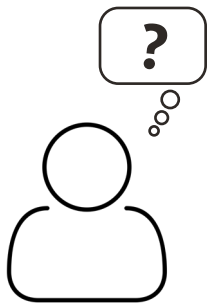
Number of connections between neurons decline



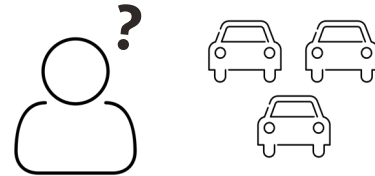
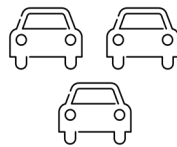
Number of neurotransmitter receptors decrease

MILD COGNITIVE IMPAIRMENT

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



Forgetting recent conversations

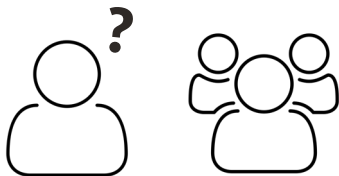


Becoming disorientated in familiar places

DEMENTIA

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

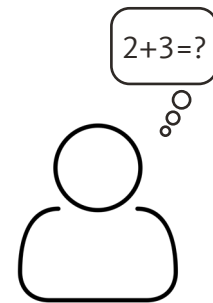
Symptoms of dementia may include:



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 & SOURCES

TAKE-HOME MESSAGE

Long-chain Omega-3 Polyunsaturated Fatty Acids, EPA and DHA

• Nerve cell membranes are very rich in fatty acids, especially the long-chain omega-3 polyunsaturated fatty acid, DHA.

• Oily fish, e.g., salmon, mackerel, sardines (at least 2 servings/week)
• EPA & DHA: At least 500 mg/day

• Higher dietary intake of fatty fish is associated with beneficial effects on cognitive function.
• EPA and DHA supplements may have beneficial effects in individuals with mild cognitive impairment.

Vitamin B₆, Folate, and Vitamin B₁₂

• Three B–vitamins work together to lower blood homocysteine concentration.
• Too much homocysteine in the blood has been associated with increased risk of cognitive decline and dementia in older adults.

• Vitamin B₆ : at most, 100 mg/day
• Folic acid: at most 1,000 µg/day
• Vitamin B₁₂ : 100-400 µg/day

• In healthy older adults, B-vitamin supplementation lowers homocysteine concentration but does not improve cognitive function
• In those with mild cognitive impairment, B-vitamin supplementation may prevent further cognitive decline.

Vitamin C

• Neurons in the brain retain high concentrations of vitamin C.
• Antioxidant nutrients like vitamin C protect nerve cells from damage.

• Sweet red pepper, kiwi, strawberries
• Consume at least 400 mg/day
• 250 mg supplement, twice/day

• Eating a vitamin C-rich diet can have a protective effect against age-related cognitive decline.

Vitamin D

• Vitamin D influences the growth, development, and survival of neurons.

• 2,000 IU (50 µg) of supplemental vitamin D daily for generally healthy adults

• 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.

Vitamin E

• Vitamin E prevents oxidative damage to lipids and therefore helps protect nerve cell membranes.

• Almonds, avocado, vegetable oil
• 15 mg/day

• 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).

Flavonoids

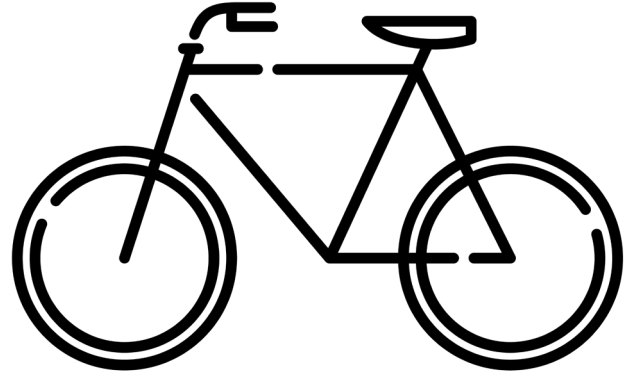
• Flavonoids may improve blood vessel function and influence the communication between nerve cells.

• Dark cocoa powder, blueberries

• Daily consumption of flavonoid-rich food and beverages improves cognitive function in healthy older adults and in those with mild cognitive impairment.

UNITS OF MEASURE: 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

- lpi.oregonstate.edu/mic/health-disease/cognitive-function-in-brief
- lpi.oregonstate.edu/mic/health-disease/cognitive-function

