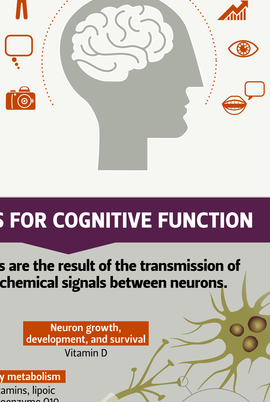
NUTRTION AND COGNITIVE FUNCTION

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

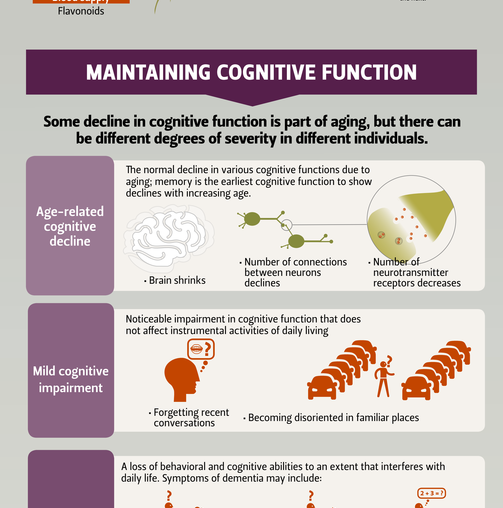
Cognitive function refers to a variety of mental processes, including:

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



BASIC NEEDS FOR COGNITIVE FUNCTION

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

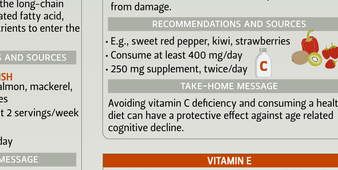


MAINTAINING COGNITIVE FUNCTION

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

Age-related cognitive decline

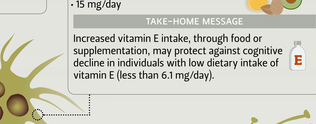
The normal decline in various cognitive functions due to aging; memory is the earliest cognitive function to show declines with increasing age.



- 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.)

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. These enable nutrients to enter the cells.

RECOMMENDATIONS AND SOURCES

OILY FISH
e.g., Salmon, mackerel, sardines
At least 2 servings/week

EPA & DHA
At least 500 mg/day

TAKE-HOME MESSAGE

- 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 C

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

RECOMMENDATIONS AND SOURCES

- E.g., sweet red pepper, kiwi, strawberries
- Consume at least 400 mg/day
- 250 mg supplement, twice/day

TAKE-HOME MESSAGE

Avoiding vitamin C deficiency and consuming a healthy diet can have a protective effect against age related cognitive decline.

VITAMIN E

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

RECOMMENDATIONS AND SOURCES

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

TAKE-HOME MESSAGE

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).

FOLIC ACID, VITAMIN B_{12}, and VITAMIN B_6

- These 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.

RECOMMENDATIONS AND SOURCES

- Folate: at most, 1000 µg/day
- Vitamin B_{12}: 100–400 µg/day
- Vitamin B_6: at most, 100 mg/day

TAKE-HOME MESSAGE

- 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.

FLAVONOIDS

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

RECOMMENDATIONS AND SOURCES

Dark cocoa powder, blueberries

TAKE-HOME MESSAGE

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

VITAMIN D

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

RECOMMENDATIONS AND SOURCES

Generally healthy adults take 2,000 IU (50 µg) of supplemental vitamin D daily.

TAKE-HOME MESSAGE

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.

Things that benefit brain health also benefit heart health!

g = grams | mg = milligrams | µg = micrograms
ng = nanograms | nmols = nanomoles | IU = International Units

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: http://lpi.oregonstate.edu/mic/micronutrients-health/cognitive-function
- Best T. and Dye L., Nutrition for Brain Health and Cognitive Performance. New York: CRC Press; 2015.
- BrainFacts.org

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