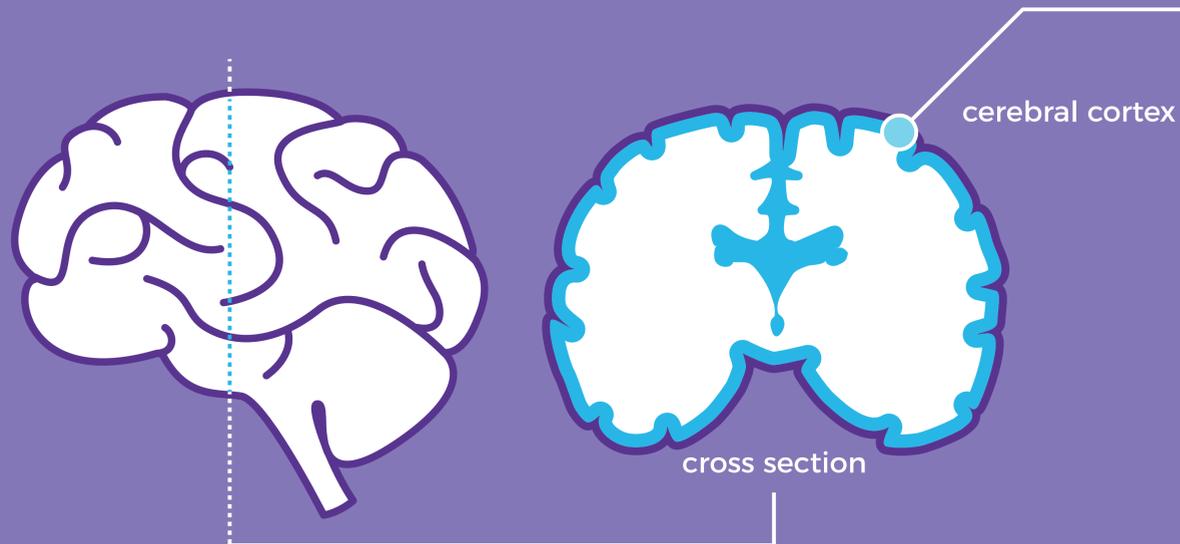


Role of nutrients in brain structure and function

Like any other organ, the brain needs specific nutrients to function properly.^{1,2}



Adult human brain:

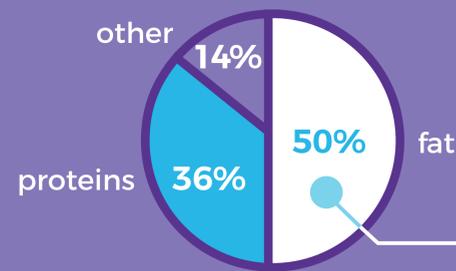
weight⁴



total energy expenditure¹



dry weight⁵



The brain needs lifelong nourishment to maintain its structure and function and to help ensure optimal cognitive performance.¹

Choline

precursor for the neurotransmitter acetylcholine.

Vitamin B6

cofactor in the synthesis of the neurotransmitters serotonin, dopamine, and noradrenaline.

Vitamin C

cofactor for synthesis of the neurotransmitter noradrenaline.

Folate

essential in the one-carbon metabolism, which is involved in the synthesis of neurotransmitters and phospholipids.

Neurons form a communication network by connecting with each other through junctions called synapses.²

Average number of neurons in the brain⁶:

86,000,000,000



Nutrients are involved in many different synaptic processes, such as neurotransmitter and phospholipid synthesis.¹

Neurotransmitters are the key molecules in the communication at synapses, and their synthesis depends on ingested nutrients.

Estimation of total number of synapses in the cerebral cortex^{7,8}:

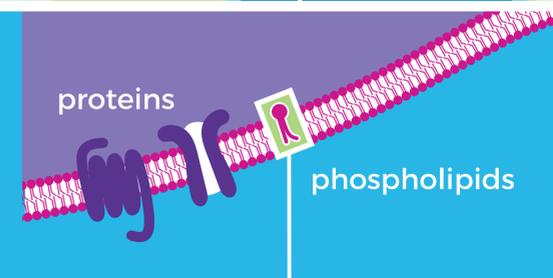
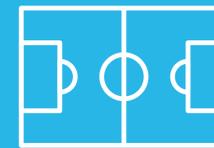
60-240 trillion



Phospholipids are major building blocks of synaptic membranes.

Total membrane surface area in the brain⁹:

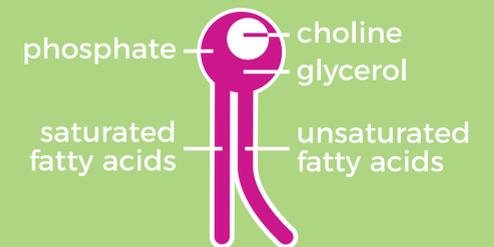
4x



Phospholipids are made from ingested nutrients, e.g. DHA, uridine, choline, folate.^{1,3}

phospholipid fraction⁴:

50%



Tryptophan

precursor for the neurotransmitter serotonin.

DHA

docosahexaenoic acid, an omega-3 polyunsaturated fatty acid present in neuronal membranes and which influences membrane-related processes such as neurotransmission.

Vitamin E

antioxidant that protects cell components, like the neuronal membranes, from oxidation by free radicals.

Tyrosine

precursor for the neurotransmitters dopamine and noradrenaline.

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