

What makes the brain works and why it ages and becomes unhealthy

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Training Objectives

- Understand important components of the brain
- Learn how to navigate thru the various functions and interactions of the brain with the lymphatic system and other parts of your body
- Why your metabolism has a greater influence on the health of your brain
- How you can slow down the aging process of your brain
- Q&A

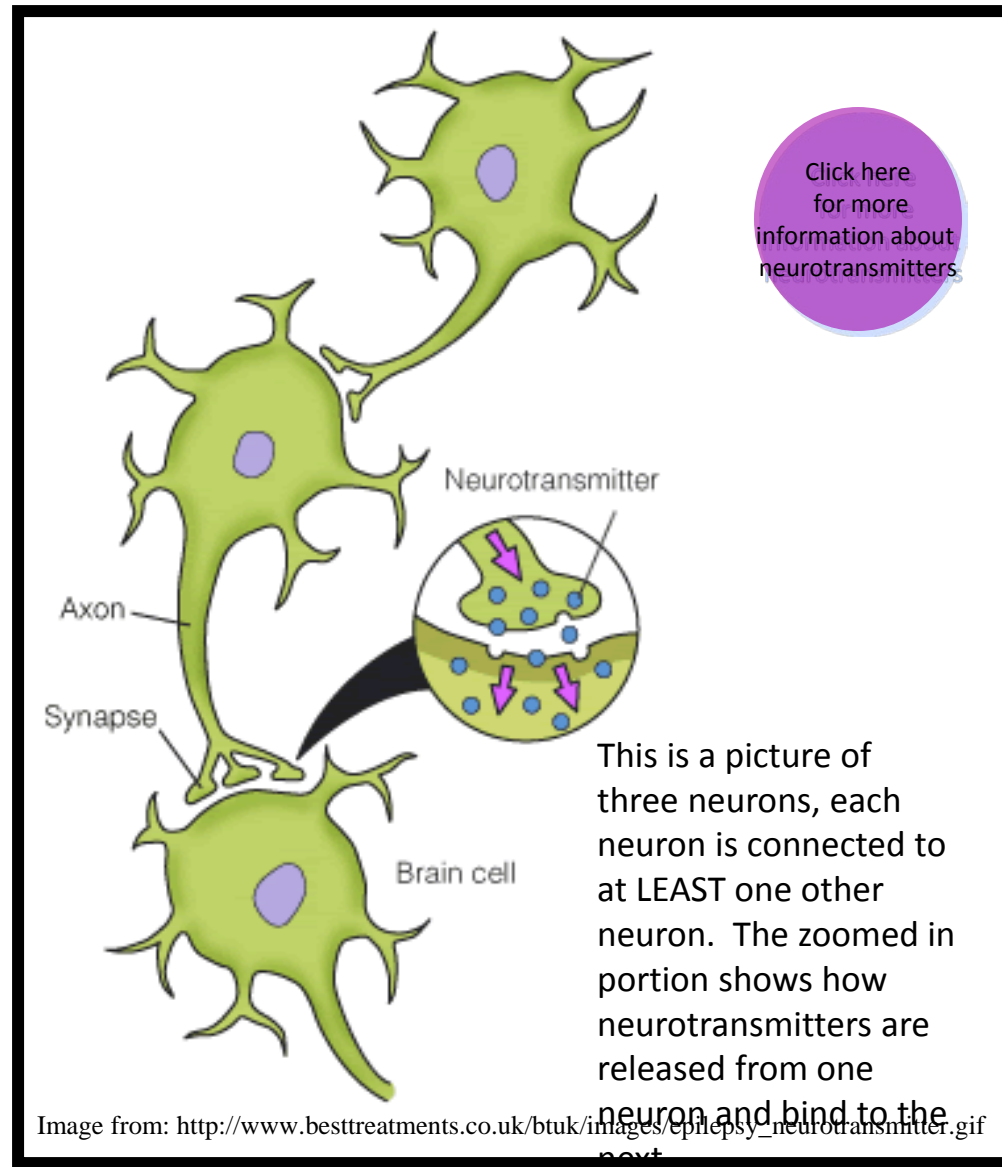
Major components of the brain

- Neurons and neurotransmitter
- Vascular system and the Blood Brain Barrier (BBB)
- Developments about how the brain works and the aging process

Neurotransmitters

Neurons must be able to communicate with each other they do this by passing on signals. There are two types of ways neurons signal one another, both result in a charge flowing from one neuron to the next. Neurotransmitters are one way neurons signal each other. One neuron releases a “neurotransmitter” and the other neuron has special receptors that bind to the transmitter thus sending information. There are hundreds of neurotransmitters below are just a few.

Serotonin
Dopamine
Epinephrine
Acetylcholine



[Click here to see an animation of neurotransmitters in action.](#)

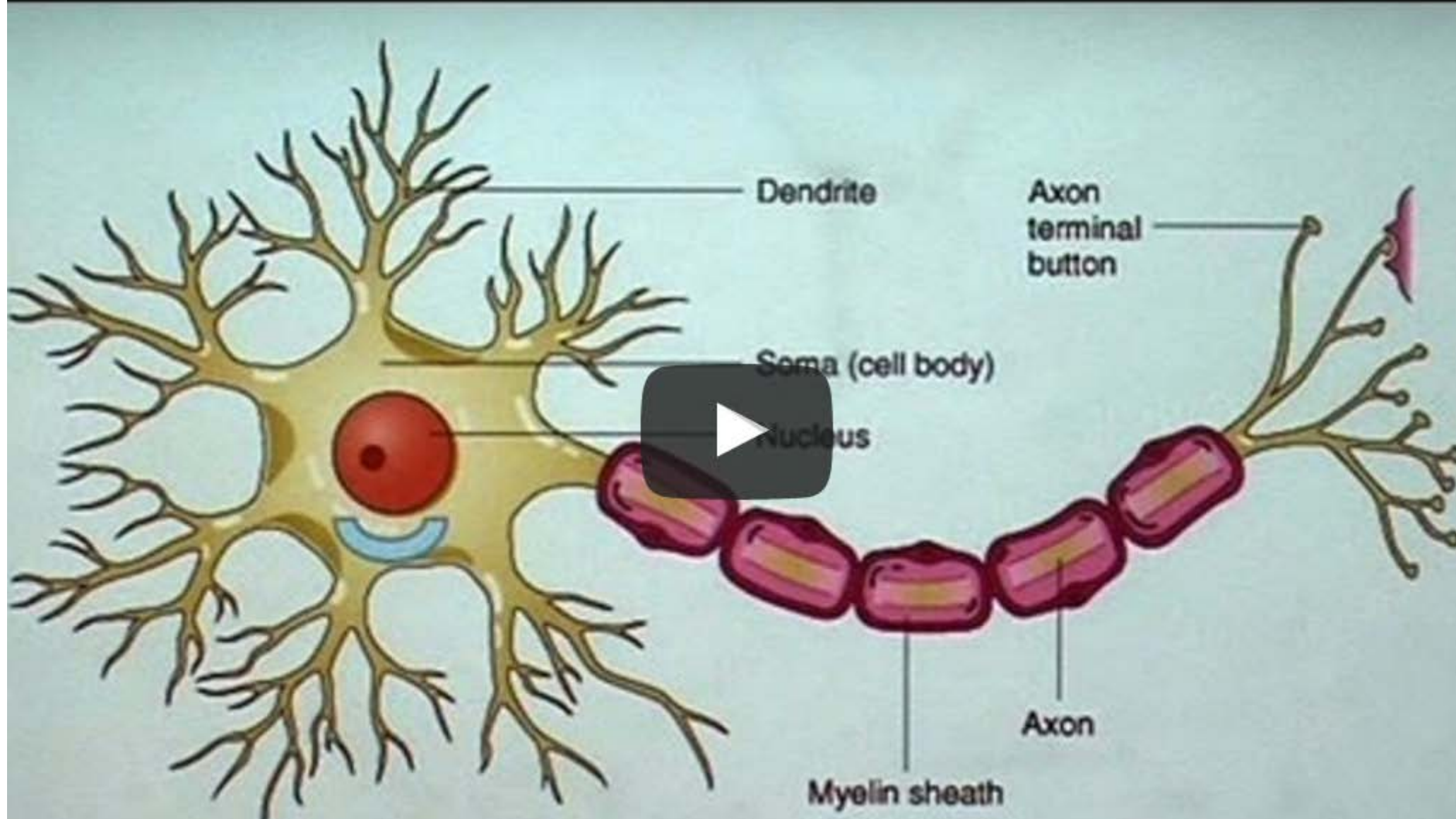
Neutransmitter

- Carry messages
- Changes the structure of the synapse
- Communicates by sending reverse-direction messages which impacts release or reuptake of transmitters

Major neurotransmitter

- Amino acids: glutamate,[4] aspartate, D-serine, γ -aminobutyric acid (GABA), glycine
- Gasotransmitters: nitric oxide (NO), carbon monoxide (CO), hydrogen sulfide (H₂S)
- Monoamines: dopamine (DA), norepinephrine (noradrenaline; NE, NA), epinephrine (adrenaline), histamine, serotonin (SER, 5-HT)
- Trace amines: phenethylamine, N-methylphenethylamine, tyramine, 3-iodothyronamine, octopamine, tryptamine, etc.
- Peptides: somatostatin, substance P, cocaine and amphetamine regulated transcript, opioid peptides[9]
- Purines: adenosine triphosphate (ATP), adenosine
- Others: acetylcholine (ACh), anandamide, etc

The Aging but Resilient Brain: Keeping Neurons Ha...



Vascular system and the Blood Brain Barrier (BBB)

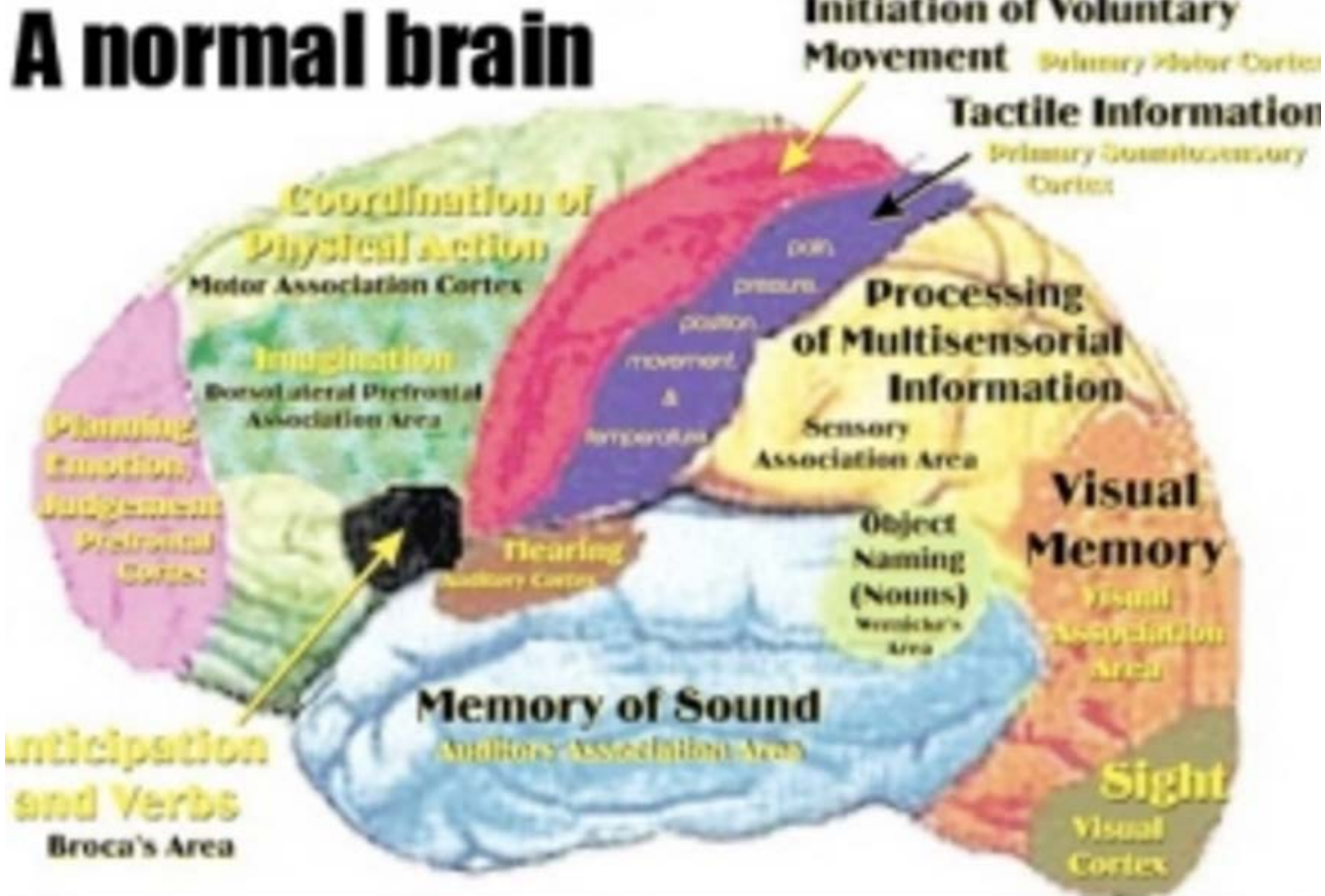
- Electrical charges, waves and images
- Detoxing the brain
- Entry of microbes, bacteria, virus

How the brain function in Alzheimer's and Parkinson's disease

- Brain chemistry
- Neurotransmitter
- Metabolic causes of the disease
- Signs and Symptoms

Normal Brain

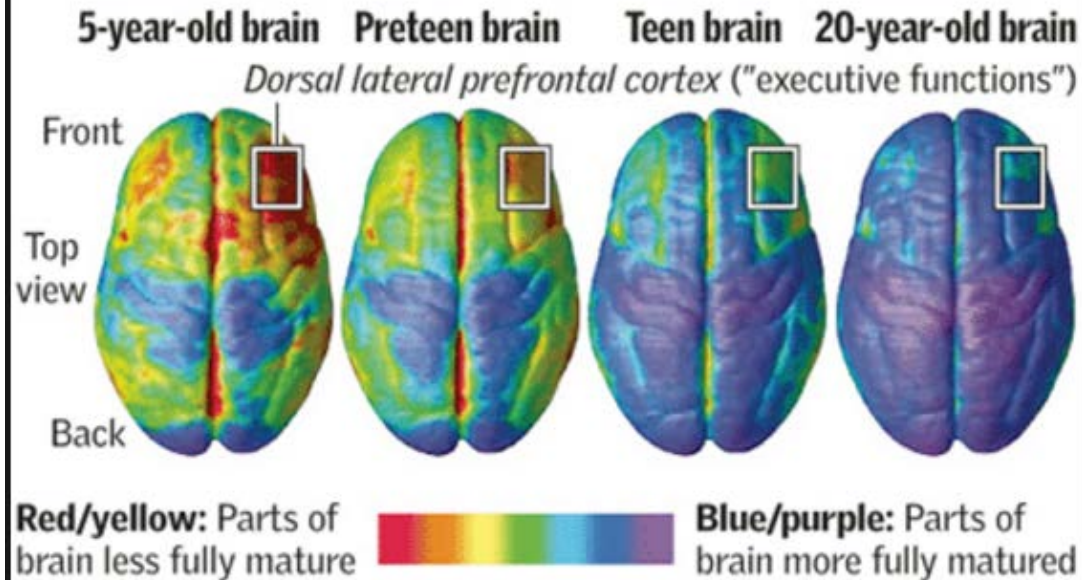
A normal brain



Judgment last to develop

Judgment last to develop

The area of the brain that controls "executive functions" — including weighing long-term consequences and controlling impulses — is among the last to fully mature. Brain development from childhood to adulthood:

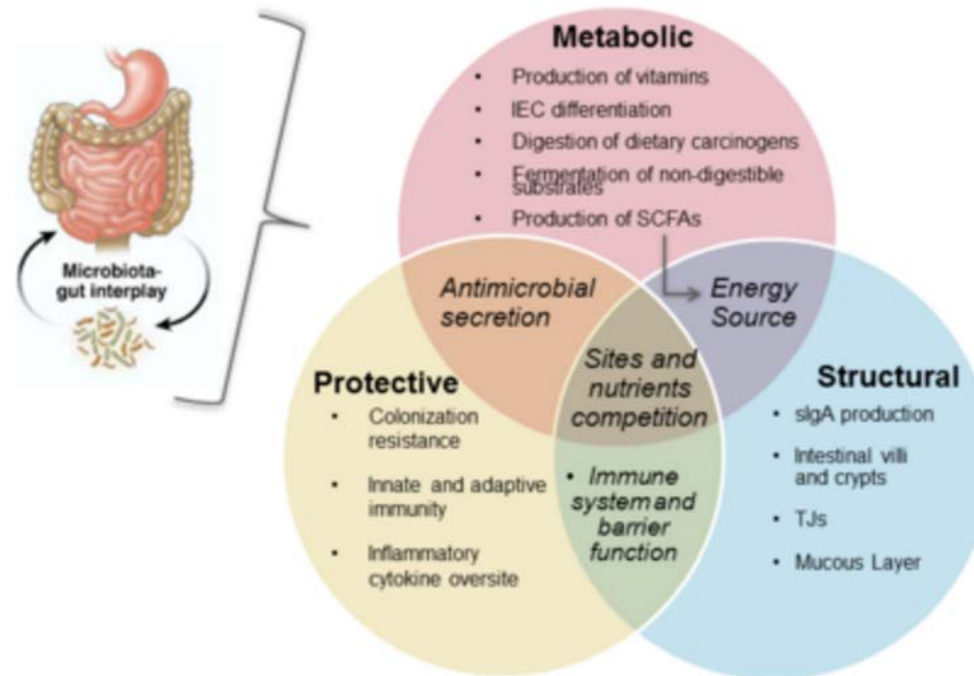


Sources: National Institute of Mental Health;
Paul Thompson, Ph.D., UCLA Laboratory of
Neuro Imaging

Thomas McKay | The Denver Post

Gut and the brain

The Microbiota-gut Interplay Serves Many Functions



Grenham S, Clarke G, Cryan JF, Dinan TG. [Brain-gut-microbe communication in health and disease](#). *Front Physiol.* 2011;2:94. Epub 2011 Dec 7. PubMed PMID: 22162969; PubMed Central PMCID: PMC3232439

Slowing down the aging process

- Neurotransmitter
- Energy
- Nutrition
- Toxins
- Other multifactorial causes of the aging brain