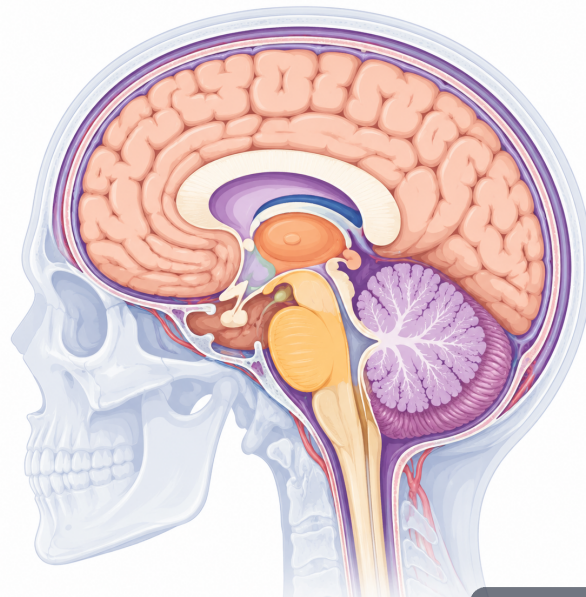


The Human Brain: Structure, Function & Neural Control

Command center of the nervous system

The human brain is a three-pound organ made of about 86 billion neurons that controls every voluntary movement, processes every sensory input, and generates every thought you have. It sits protected inside the skull, continuously firing electrical signals across synapses to coordinate breathing, heartbeat, memory, emotion, and consciousness. Despite being only 2% of body weight, it consumes roughly 20% of the body's oxygen and glucose.



QUICK FACTS

- 1 Contains approximately 86 billion neurons and 85 billion non-neuronal cells
- 2 Weighs about 1.3 to 1.4 kg in adults (roughly 2% of total body weight)
- 3 Consumes 20% of the body's oxygen supply despite its small size
- 4 Generates about 20 watts of power when awake (enough to power a dim light bulb)
- 5 Can process information as fast as 268 mph along myelinated nerve fibers
- 6 60% of the brain is fat, making it the fattiest organ in the body
- 7 Brain cells communicate across 100 trillion synaptic connections

Key Features

Cerebrum: Thinking & Voluntary Action

The largest part, divided into two hemispheres and four lobes, handles conscious thought, memory, language, sensory processing, and voluntary muscle control.

Cerebellum: Balance & Coordination

Located at the back below the cerebrum, it fine-tunes motor movements, maintains posture, and coordinates muscle activity so movements are smooth rather than jerky.

Brain Stem: Automatic Life Functions

Connects the brain to the spinal cord and controls involuntary functions like heart rate, breathing, blood pressure, and sleep-wake cycles without conscious effort.

Neurons: Electrical Signaling

Specialized nerve cells transmit information through electrical impulses and chemical neurotransmitters across synapses, forming the basis of all brain activity.

Meninges & Cerebrospinal Fluid

Three protective membrane layers (dura, arachnoid, pia mater) and cushioning fluid surround the brain, absorbing shocks and filtering out pathogens.

Breakdown

Frontal Lobe

Controls reasoning, planning, speech production (Broca's area), problem-solving, emotions, and voluntary movements through the motor cortex.

Parietal Lobe	Processes touch, temperature, pain, and spatial awareness; integrates sensory information from different parts of the body.
Temporal Lobe	Handles auditory processing, memory formation (hippocampus), language comprehension (Wernicke's area), and recognizing faces.
Occipital Lobe	Located at the back of the cerebrum, dedicated entirely to processing visual information from the eyes.
Thalamus	Acts as a relay station, routing sensory and motor signals to the cerebral cortex and regulating consciousness and alertness.
Hypothalamus	Small but vital region controlling body temperature, hunger, thirst, sleep, and hormone release through the pituitary gland.
Corpus Callosum	A thick bundle of nerve fibers connecting the left and right hemispheres, allowing them to communicate and coordinate.
Medulla Oblongata	The lowest part of the brain stem controlling vital reflexes like breathing, heart rate, vomiting, and swallowing.

Did you know?

- The left hemisphere typically controls the right side of the body and vice versa because nerve fibers cross over in the medulla.
- Your brain generates enough electricity while awake to power a small LED bulb, with neurons firing at rates up to 200 times per second.
- The human brain stops growing around age 25 when the prefrontal cortex (responsible for decision-making and impulse control) fully matures.
- During REM sleep, your brain is nearly as active as when you're awake, which is why dreams can feel so vivid and real.

Explore the interactive version online - with clickable hotspots on the diagram - free at <https://lernizy.com/infographics/the-human-brain-structure-function-neural-control>