

The Brain...



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History of Studying the Brain

- Franz Joseph Gall (1758 - 1828)
- Phrenology
- The study of the structure of the skull to determine a person's character and mental capacity
- 26 'organs' on the surface of the brain

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History of Studying the Brain

Phrenological
Map of the Skull



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History of Studying the Brain

- Flourens (1794 - 1867)
- Emphasized the importance of experimental research of the brain
- Carefully controlled experiments on animals to determine localities of brain and their functions
- Moved the field of brain research into a more scientific arena

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http://www.youtube.com/watch?v=_0aNILW6lLk&safety_mode=true&persist_safety_mode=1&safe=active

[Studying the Brain...](#)

The following is a list of the tools and techniques used to help gather information on the brain:

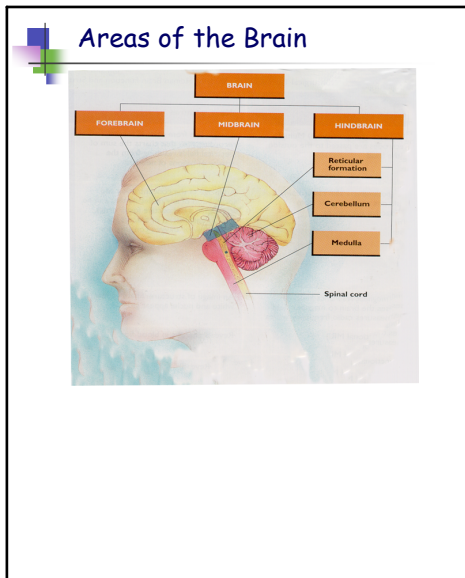
1. **Lesions** - The surgical destruction or removal of brain tissue.
2. **Electroencephalogram (EEG)** - A machine that measures brain electric activity.
3. **Computed Tomograph (CT or CAT Scan)** - This apparatus takes x-ray photographs of brain and can reveal brain damage.
4. **Positron emission tomograph (PET Scan)** - It detects radioactive glucose consumption in brain. Allows us to see active metabolic areas.
5. **Magnetic Resonance imaging (MRI)** - It generates detailed pictures of the brain's soft tissues by making use of magnetic activity. Makes use of magnetic fields which appear to be less harmful than x-rays.

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The Brain

- Three main parts:
- Brain Stem
- Limbic System
- Cerebral Cortex

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Brain Stem

- Region of the brain where the spinal cord enters the skull and swells
- **Medulla**
- Regulates heart-rate, breathing, blood pressure, and motor movements
- **Cerebellum**
- Controls skilled motor movements

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Brain Stem

- **Pons**
- Connects the two hemispheres of the cerebellum
- **Reticular formation**
- Sleep (Moruzzi & Magoun, 1961)
- Attention
- **Thalamus**
- Relay center
- Filters & organizes information from senses

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Limbic System

- **Hypothalamus**
- Feeding
- Reproductive behavior
- Temperature (Barbour, 1912)
- **Hippocampus**
- Memory
- H.M.
- **Amygdala**
- Feeding
- Memory
- Emotion

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Cerebral Cortex

- Two halves, four **2011** lobes
- Frontal lobe
- Motor cortex
- Parietal lobe
- Sensory cortex
- Prosopagnosia
- Unilateral neglect
- Temporal lobe
- Auditory areas
- Occipital lobe
- Visual areas

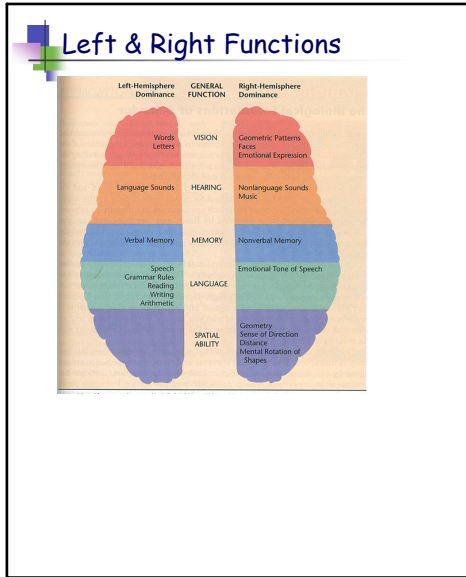
The diagram shows a lateral view of the human brain with color-coded lobes: Frontal (red), Parietal (blue), Temporal (green), and Occipital (purple). The Cerebellum is shown in pink at the base, and the Brain Stem is in yellow. Labels include 'Parietal Lobe', 'Frontal', 'Occipital Lobe', 'Temporal Lobe', 'Cerebellum', and 'Brain Stem'.

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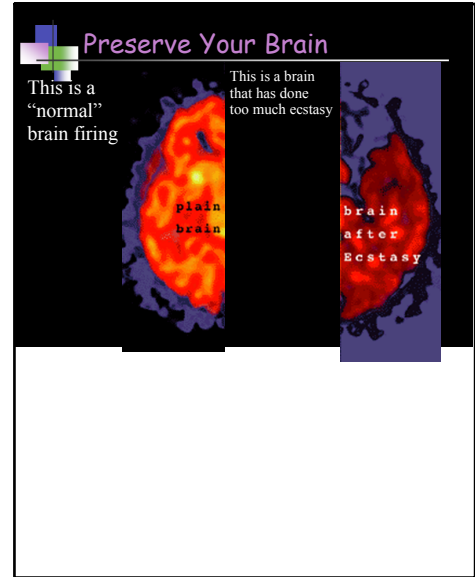
Two Cerebral Hemispheres

- Contralateral arrangement
- Corpus callosum
- Thick band of nerve fibers connecting the hemispheres
- It's how the 2 hemispheres communicate
- Right-brained vs. left-brained?

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Language

Language requires the coordination of many brain areas. Damage to any one can result in APHASIA

Visual cortex - allows us to see the words.

Angular Gyrus - converts words into auditory code

Wernicke's Area - enables us to get meaning from the auditory code

Broca's area - controls motor cortex that activates speech muscles to pronounce words.

If there is damage to #1 -

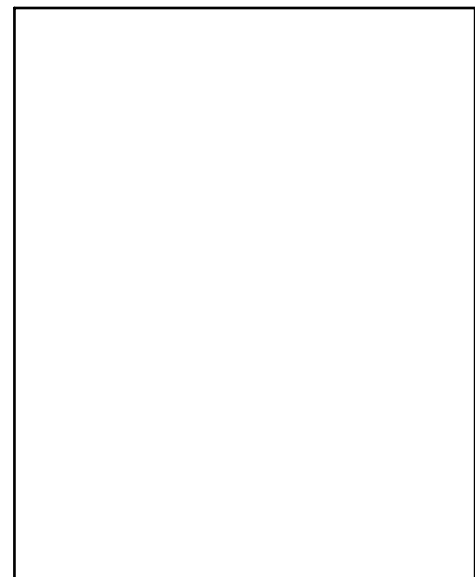
If there is damage to #2 -

If there is damage to #3 -

If there is damage to #4 -

http://www.ted.com/talks/michael_merzenich_on_the_elastic_brain.html

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