

Body and Behavior

Chapter 4

Jan 14-12:40 PM

Nervous System

- Nerve fibers – nerve cells that carry messages to and from the brain
- Receptors – cells that gather information (senses)
- Effectors – cells that work muscles and internal glands and organs (motor skills)

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How the system works

- Neurons – sends messages to and from the brain along the nerve fibers
 - Synapses – gaps between nerve cells
 - Axons - carry info. to other neurons
 - Dendrites - receive info. from other neurons
 - Neurotransmitters – connect electrochemical impulses sent by neurons
- Sends info. To next neuron or stops transmission
 *Ascending tract – from senses to brain
 *Descending tract - from brain to motor skill effectors - motor skills

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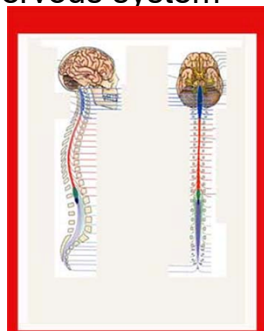
Types of neurotransmitters

- Acetylcholine (memory, movement, autonomic nervous system function)
Effects Alzheimer's
- Epinephrine - (arousal, emergency)
- Norepinephrine (memory, learning, arousal)
Depression
- Serotonin (sleep, appetite, mood)
Depression and OCD
- Endorphins (pain)
- Dopamine (planning, reward, emotions, movement)
Schizophrenia (oversupply)
Parkinson's disease (undersupply)
Addictions

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Central Nervous system

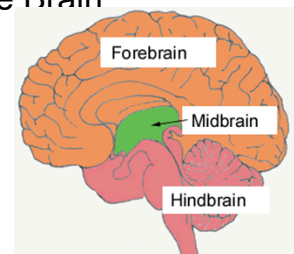
- Brain – interpretation of incoming info.
- Spinal cord – carries information to and from the brain



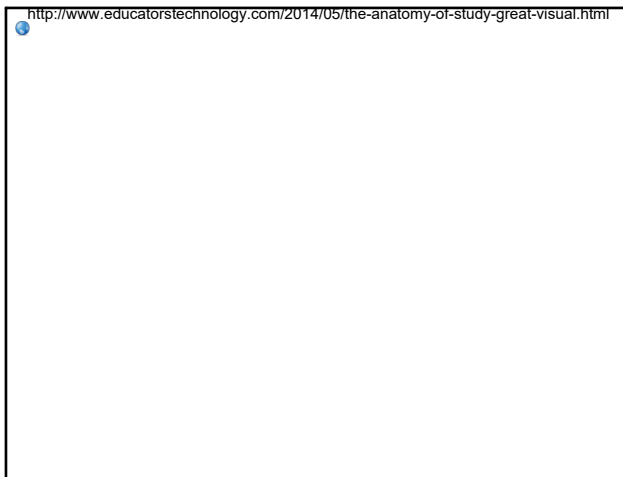
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The Brain

- Hindbrain
- Midbrain
- Forebrain



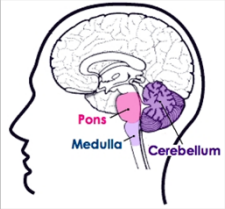
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May 1-10:10 AM

Hindbrain

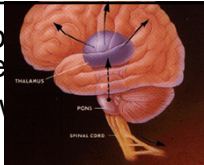
- **Cerebellum**
base of the spinal cord
posture and balance (highly effected by alcohol)
- **Medulla** –respiration, heart rate, blood pressure (damage=quick death)
- **Pons** - bridge between spinal cord and brain
Produces chemicals for sleep, arousal, facial expressions



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Midbrain

- located just above the hindbrain
- Lets the forebrain know about incoming info
- Reticular activating system - control of mood, arousal, sleep
- contains serotonin and norepinephrine



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Forebrain

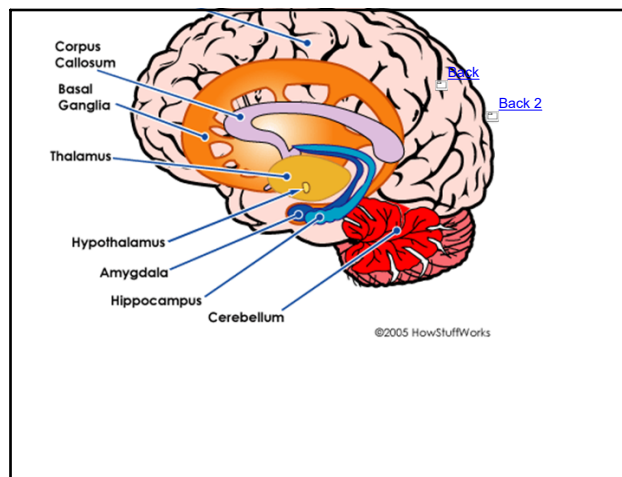
- Thalamus** - A main sensory relay and movement
- Hypothalamus** – The master of the autonomic nervous system
Body temperature, sleep, hunger, emotions
- Limbic system** - "the emotional brain"
 - Hippocampus** –storage and retrieval of memories from other parts of the brain
 - Amygdala** – identifies, responds, and remembers fear and aggression

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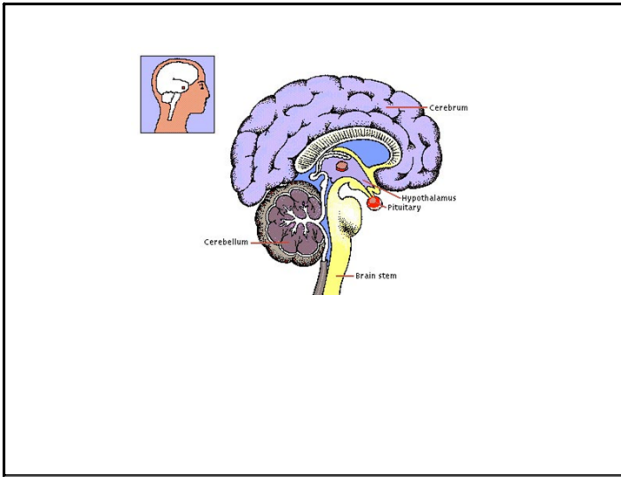
Forebrain

- **Nucleus Accumbens**- reward and pleasure
- **drugs, eating, sex, gambling**
- **Basal Ganglia** - voluntary motor movements
- **Corpus Callosum** - A connection of fibers that links the two cerebral hemispheres.

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Forebrain – Cerebral Cortex

- Thought
- Voluntary movement
- Language
- Reasoning
- Perception

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Cerebral Cortex

- Somatosensory cortex – receives info.
- Motor cortex – sends info. for body movement

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Cerebral Cortex - Lobes

- Parietal Lobe
- Occipital lobe
- Frontal lobe
- Temporal lobe

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Parietal Lobe

- Perception of touch, pain, temperature, pressure
- Depth perception

Somatosensory Cortex

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Occipital Lobe

- Vision

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Temporal Lobe

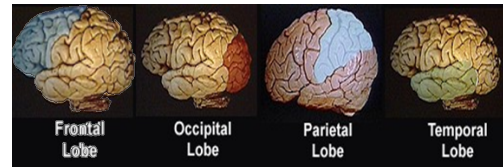
- Perception and recognition of auditory stimuli
- Higher visual tasks (facial and object recognition)
- Memory
- Wernicke's area - comprehension of speech (left only)



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Frontal Lobe

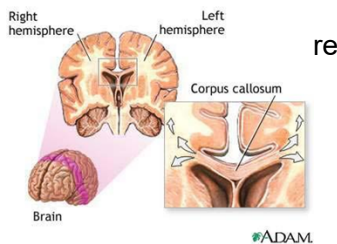
- Reasoning
- Broca's Area - Articulating speech (left only)
- Movement
- Emotions
- Problem solving



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Hemispheres

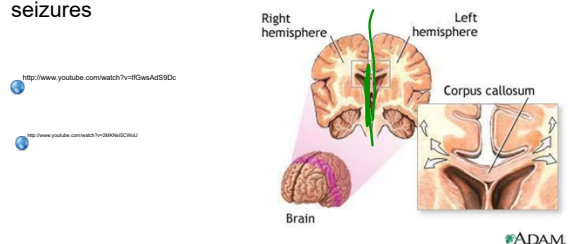
- Left hemisphere
- Verbal
- Mathematical
- Analytical
- Logical



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Corpus Callosum

- 1 million nerve fibers connecting the 2
- Split brain surgery – controls epileptic seizures



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Split Brain

- Patient was told to stare at a dot and word nut flashed to right side of the dot (went to left hemisphere)
- Person was able to read and understand
- word nut flashed to left side of the dot (went to right hemisphere/non-verbal)
- Was not able to say, but picked out the nut with the left hand

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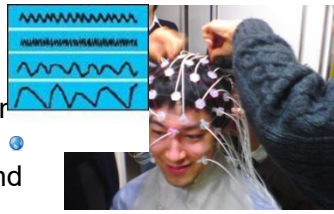
Split brain

- Nude woman was flashed to left side of the eye (went to right hemisphere)
- Woman laughed but said nothing and said she saw nothing because only left can speak and left didn't see the nude woman

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How to study the brain

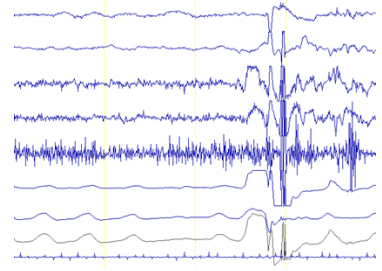
- Electrical recordings
- EEG
- Measures brain waves
- Study sleep and brain damage



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Polygraph-EEG

EEG will be affected by arousal



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Studying the brain

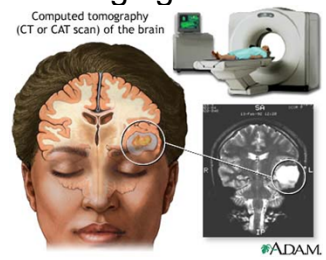
- Lesioning – destroy tissue
- Electrical stimulation – send current to specific brain part
- Brain imaging

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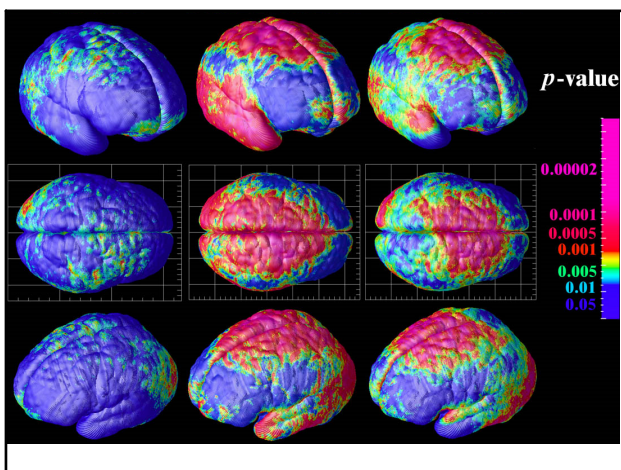
Brain imaging

Computed tomography (CT or CAT scan) of the brain

- CT Scan
- X-ray
- Diagnose mental illness
- abnormalities



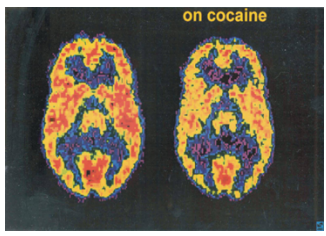
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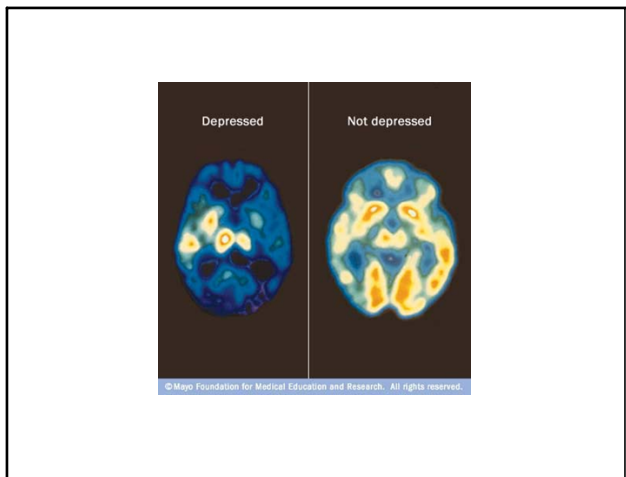
Sep 17-9:16 AM

Brain imaging

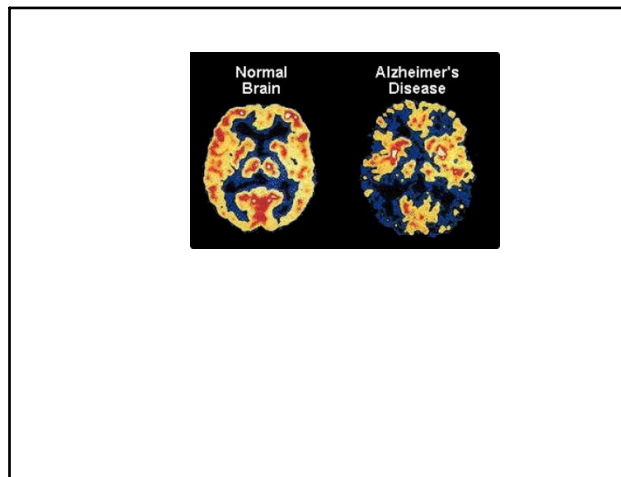
- PET scan
- Radioactive chemicals
- Map out activities



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Brain Imaging

- MRI
- 3D image

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Feb 26-10:14 AM

Damage to Brain

Concussion
 Temporary loss of consciousness
 No permanent damage unless multiple concussions
 Contusion
 Bruising of neural tissue
 May cause coma
 Loss of speech, convulsions, disorientation, delusions
 Laceration
 Foreign object penetrates brain
 Effects depend on where in the brain

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Nail In Brain Survives Gun "No man, that's in your head"

By: Cory Perrin | 01/23/2012 07:34 PM ET

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Dante Autullo and his girlfriend Gail Glaenger were shocked to learn how a victim survives a fatal blow to the brain from a nail gun as the construction worker brushed it off as nothing more than a scratch, but this Illinois man finally sought medical treatment the next day.

After the 3 1/4-inch nail became lodged in the middle of Dante Autullo, the 32-year-old Illinois man thought that the nail "just whizzed by" and he had survived the object by just cutting himself, saying it only "felt like a punch to the side of his head." He had his girlfriend, Gail Glaenger clean the wound with peroxide.

Not knowing that he had actually been shot through his skull, he went on with his day, which included, plowing snow then picking his and Glaenger's son up from school, the following day. However, Autullo started feeling more and more sick, and both he and Glaenger, thought maybe he should go to the hospital to get checked out.

Feb 26-10:16 AM

Shaken Baby Syndrome

The violent movement pitches the infant's brain back and forth within the skull, rupturing blood vessels and nerves throughout the brain and tearing the brain tissue. The brain strikes the inside of the skull, causing bruising and bleeding to the brain.



Jan 14-12:40 PM

Effects of SBS

- partial or total blindness
- hearing loss
- seizures
- developmental delays
- speech and learning difficulties
- problems with memory and attention
- severe mental retardation
- paralysis (some particularly traumatic episodes leave children in a coma)

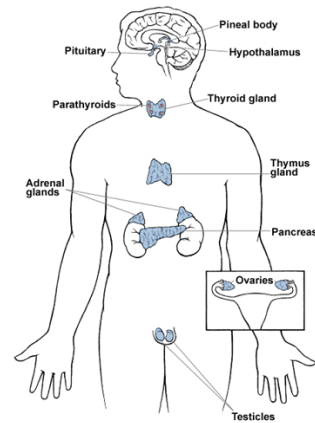
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Peripheral Nervous System

- Somatic nervous system – voluntary activities
Ex. Stand up
- Autonomic nervous system – involuntary activities
Ex. Heartbeat, pupils dilate
 - *sympathetic nervous system – prepares body for strenuous activity
Ex. Increased adrenaline
 - *parasympathetic nervous system – recovers body from strenuous activity
Ex. Stress reducers, breathing

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Endocrine system



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Endocrine System

- Hormones – chemical messages sent by the endocrine system

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Endocrine System

- Pituitary Gland – Master gland of the body
Hypothalamus directs the pit. Gland
Corrects imbalances
Regulates metabolism
**Somatotrophic hormone– regulates growth
Too little – midget (small people)
Errors – dwarf (arms/legs short but body normal proportions)
Too much – giant
- <https://www.youtube.com/watch?v=zK1hSonHrfM>
- https://www.youtube.com/watch?v=pcm_E7UoKLo

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Endo. Cont.

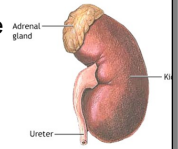
- Thyroid Gland – largest gland/regulates metabolism
 - Produces thyroxin
 - Too much – hyperactive
 - Too little – lethargic, exhausted



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Endo. Cont.

- Adrenal Gland – emergency gland
 - Adrenal cortex
 - 3 hormones
 - Steroids – strength and endurance
 - Aldosterone – water and sodium balance into blood stream (important blood pressure)
 - Cortisol – controls metabolism of carbohydrates, fats and proteins also helps fight/flight response



Jan 15-8:18 AM

Endo. Cont.

- Adrenal medulla
 - Epinephrine (aka adrenaline) emergency hormone (also some in NF so NT)
 - Regulated by sympathetic N.S
 - Noradrenalin – returns body to normal
 - Regulated by parasympathetic n.s.

Jan 15-8:18 AM

Endo. Cont.

- Pancreas
- Produces insulin and glucagon to control sugar metabolism
- Lack of insulin – diabetic

Jan 15-8:19 AM



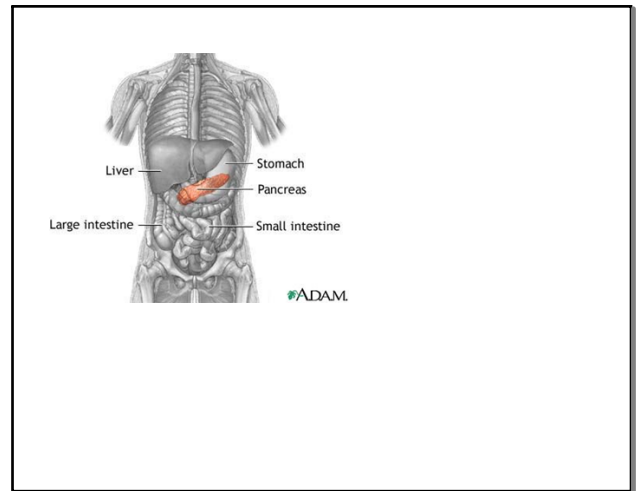
Oct 11-8:02 AM



Oct 11-8:02 AM



Oct 11-8:03 AM



Jan 15-8:19 AM

- Sex glands
 - Testes – male
 - Produce sperm and testosterone
 - Ovaries – females
 - Produce eggs, estrogen and progesterone
- ** each sex has a small amount of opposite

Jan 15-8:19 AM

Nature vs. Nurture

- Do people learn to be smart students or is it hereditary?
- Do people learn to be good athletes or is it hereditary?
- Do people learn to be homosexual or is it hereditary/genetic?

Jan 15-8:19 AM

Nature vs. Nurture

- Nature: Inborn – hereditary
 - Sir Francis Galton – Hereditary Genius
 - Found success ran in families
 - David Reimer
- Nurture: - Learned – environmental
 - John B. Watson – Behaviorist

Jan 15-8:26 AM

How to study nature vs. nurture

Twins

- Identical – develop from a single fertilized egg and share the same genes
- Fraternal – develop from 2 fertilized eggs and are no more similar than brother/sister

Schizophrenia

If 1 twin has schizo. The other is 3-6 times more likely if they are identical than if fraternal

Jan 15-8:20 AM

<https://www.youtube.com/watch?v=J0GSRaoWNk>

Separation at birth

Jim Springer and Jim Lewis reunited 48 yrs. Later Both married and divorced women named Linda and married second wives named Betty. They both named their first sons James Allan. They both drove the same model of blue Chevrolet. They both enjoyed woodworking and had built identical benches around trees in their backyards. They also vacationed at the same beach at St. Petersburg, Florida. Both had dogs named Toy. Both were police officers. Both did well math and poor in spelling, bit their fingernails, had identical smoking and drinking habits and liked mechanical drawing.

Jan 15-8:20 AM



Oct 19-8:03 AM