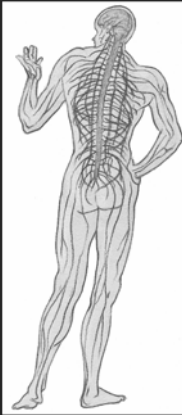


# Neurons and Brain



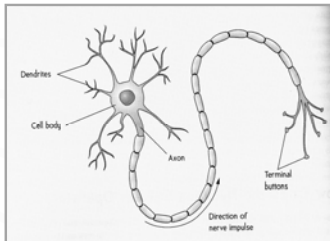
What are the building blocks of nervous system?

1. Neurons
2. Glia: supports neurons

## Neuron: Structure

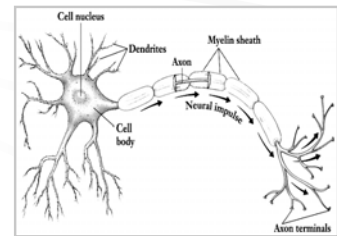
Three basic parts:

1. Cell body
2. Axon
3. Dendrites



## Neuron: Structure

- Axon terminals
- Synapse



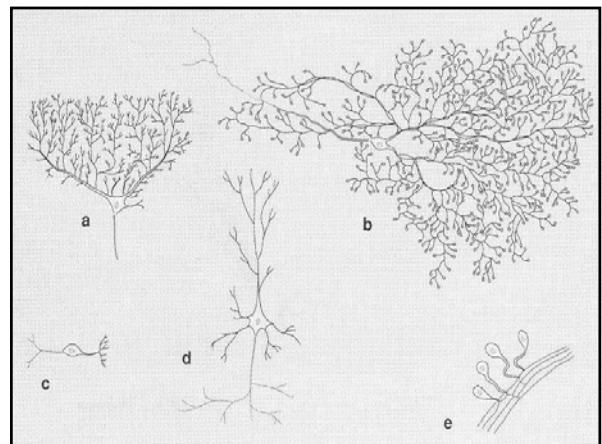
## Neuron: Function

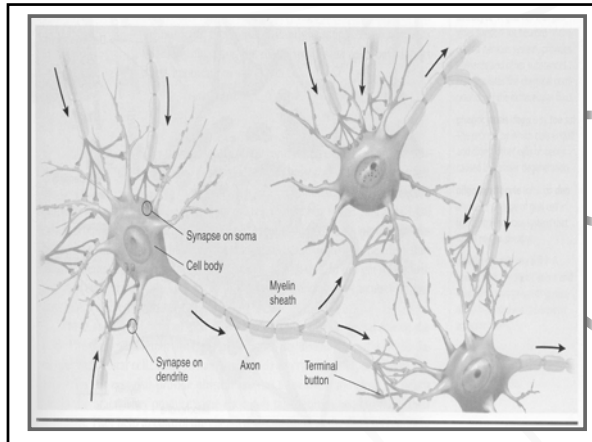
specialized in

- Receiving
- Transmitting
- Processing information



One way transmission: from dendrites to axon





## How Neurons Communicate

One way transmission:  
from dendrites to axon.

1. Electrical
2. Chemical

### 1. Electrical signals

- Resting Potential

- electrical system in equilibrium (polarization of ions)

### 1 (b) Action potential

- sudden change in the electrical charge across the neuron's membrane
- all-or-none response (threshold)

## How Neurons Communicate?

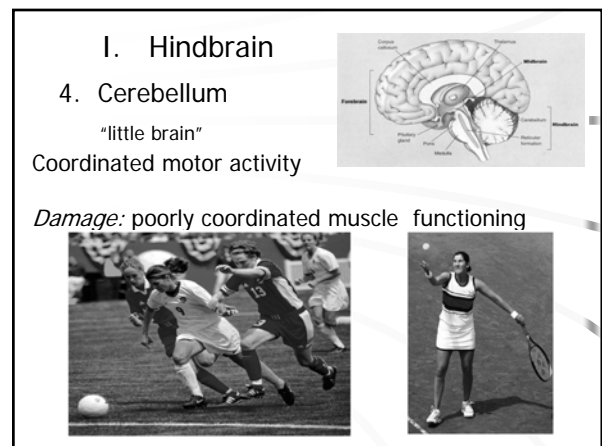
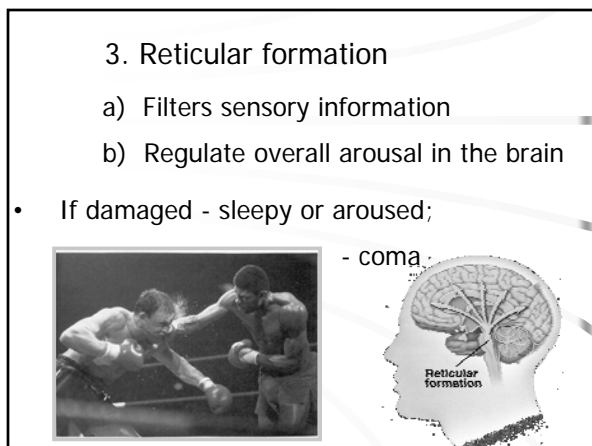
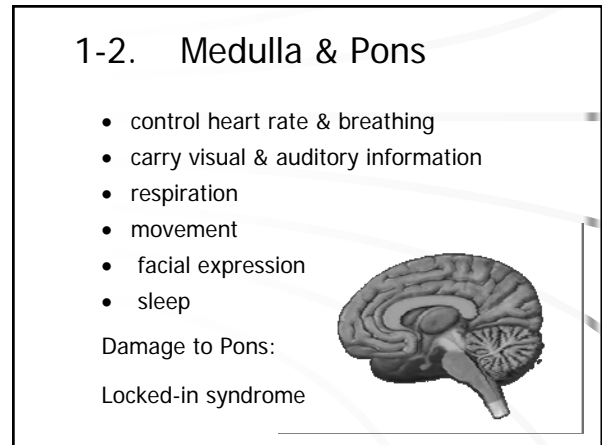
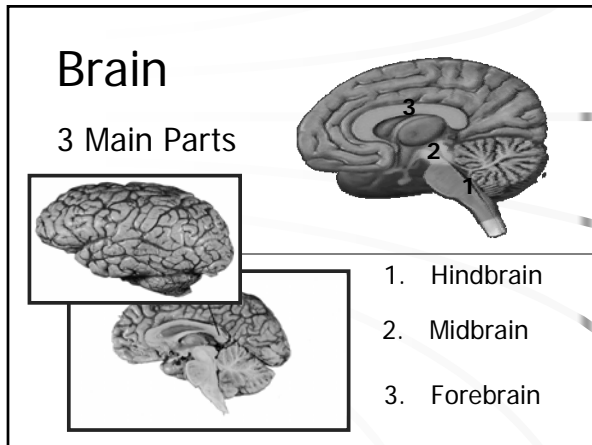
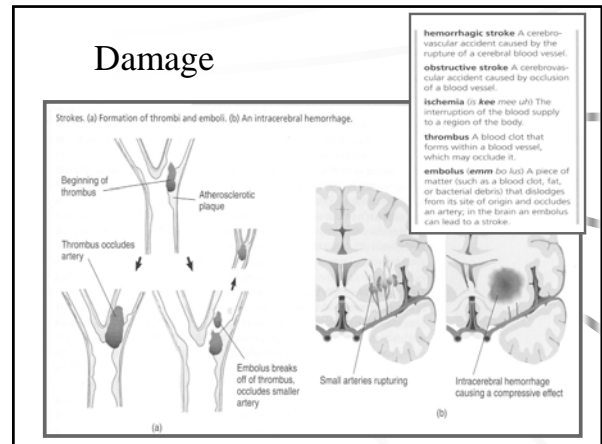
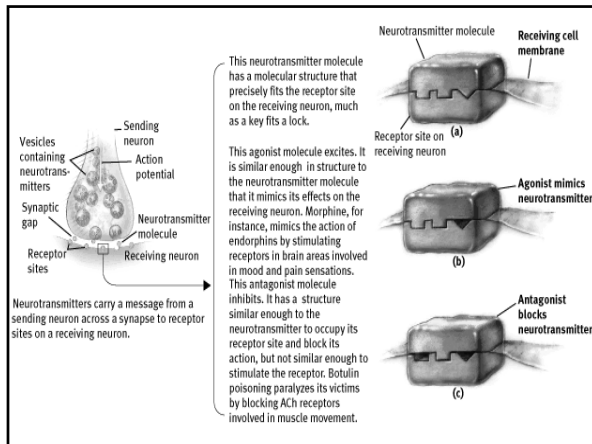
### 2. Chemical Transmission

## Synapse

Neurotransmitters

2 effects:

1. Excitatory  
generate action potential in the next neuron
2. Inhibitory  
more difficult for the second neuron to fire



## II. Midbrain

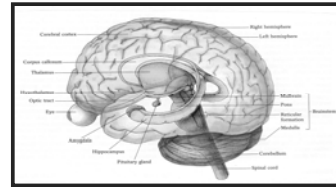
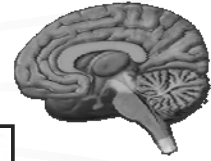
Involve in

- Vision
- Hearing
- Pain-relieving function
- Some motor movements



## III. Forebrain

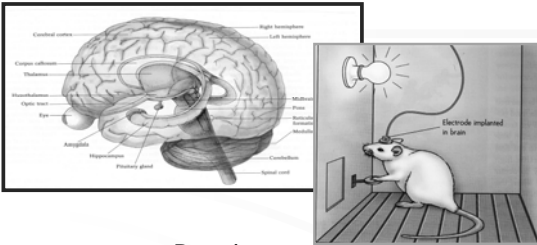
### 1. Thalamus



- Receive
- Filter
- Organize
- Transmit

information from our senses (except smell) to other parts of the brain

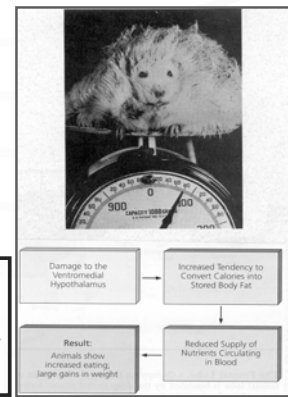
### 2. Hypothalamus



Regulates:  
Sexual behavior

- Eating & drinking (amount of nutrition stored in cells)

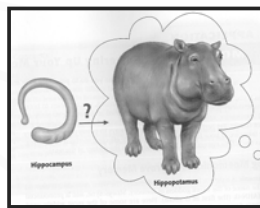
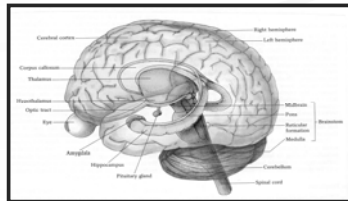
- Aggression



### 3. Limbic system

- a) Hippocampus:  
memory functioning

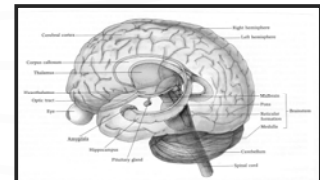
damage - inability to store new information



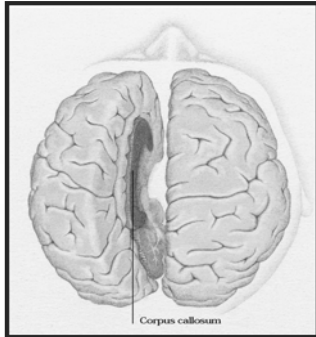
### b) Amygdala

organizes emotions

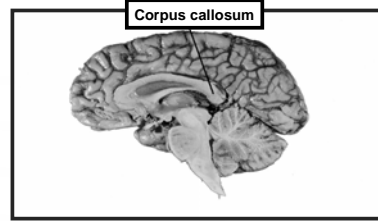
- stimulation – elicit aggression & rage
- damage – reduces aggression



#### 4. Cerebral Cortex 2 hemispheres

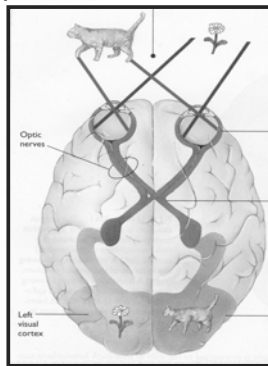


#### Corpus Callosum

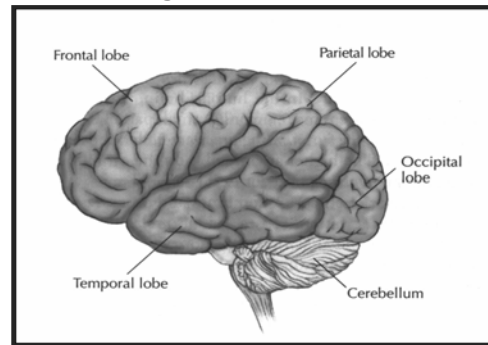


A set of axons connecting the two hemispheres

#### Split-Brain Phenomenon



#### 4 regions or lobes

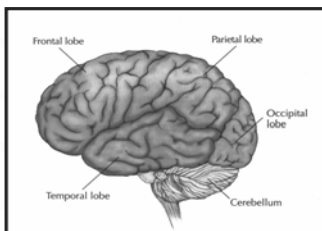


#### 1. Occipital Lobe

Vision

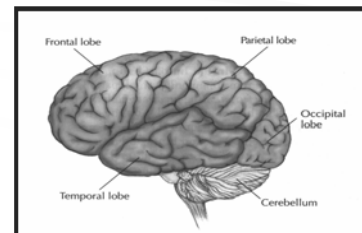
##### Damage:

- "Blindness"
- Face-blindness
- Inability to recognize colors
- Motion-blindness



#### 2. Parietal Lobe

- a) spatial awareness  
"neglect" phenomenon

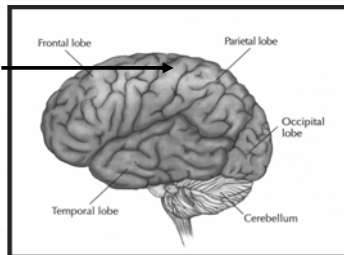


## 2. Parietal Lobe

*Sensory Cortex*

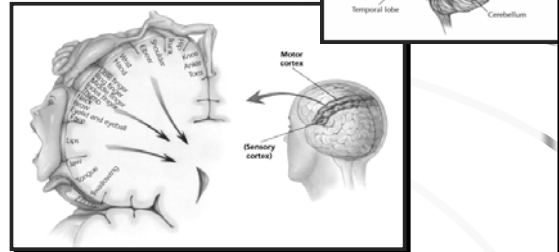
Processes  
information

about pain, touch, temperature



## 3. Frontal lobe

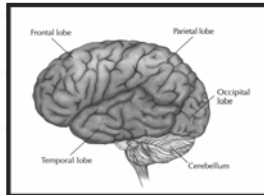
a) Primary Motor Cortex



## 3. Frontal lobe

b) "executive system"

- Planning
- Decision making
- Forming concepts
- Processing & storing information
- Self-regulation



## 4. Temporal Lobe

- hearing
- some aspects of vision

Damage to the L hemisphere

inability to understand spoken words

Damage to the R hemisphere

recognize speech, but not organizations of sound (melody, tune)

