

NERVOUS SYSTEM

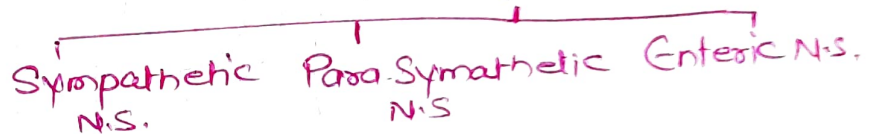
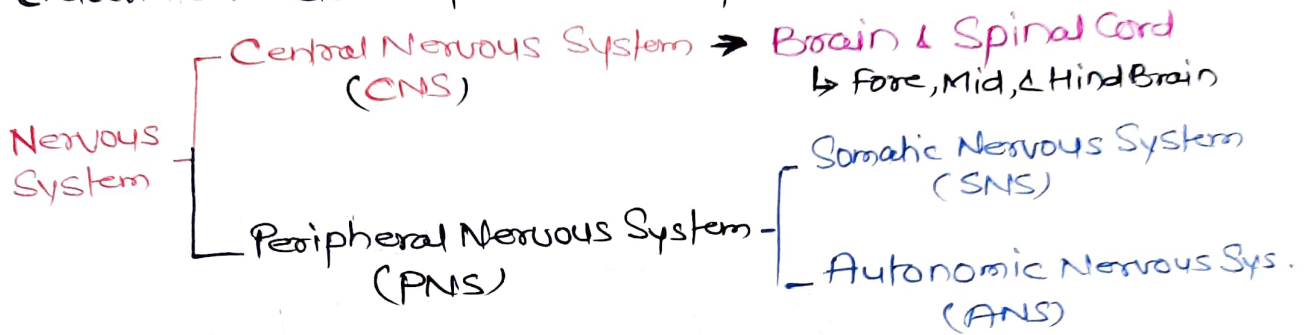


The nervous system coordinates its behaviour & transmits signals b/w different body area.

It detects & responds to changes inside & outside the body. It controls important aspects of the body functions and maintains homeostasis, works together with Endocrine System.

NS → Rapid Response

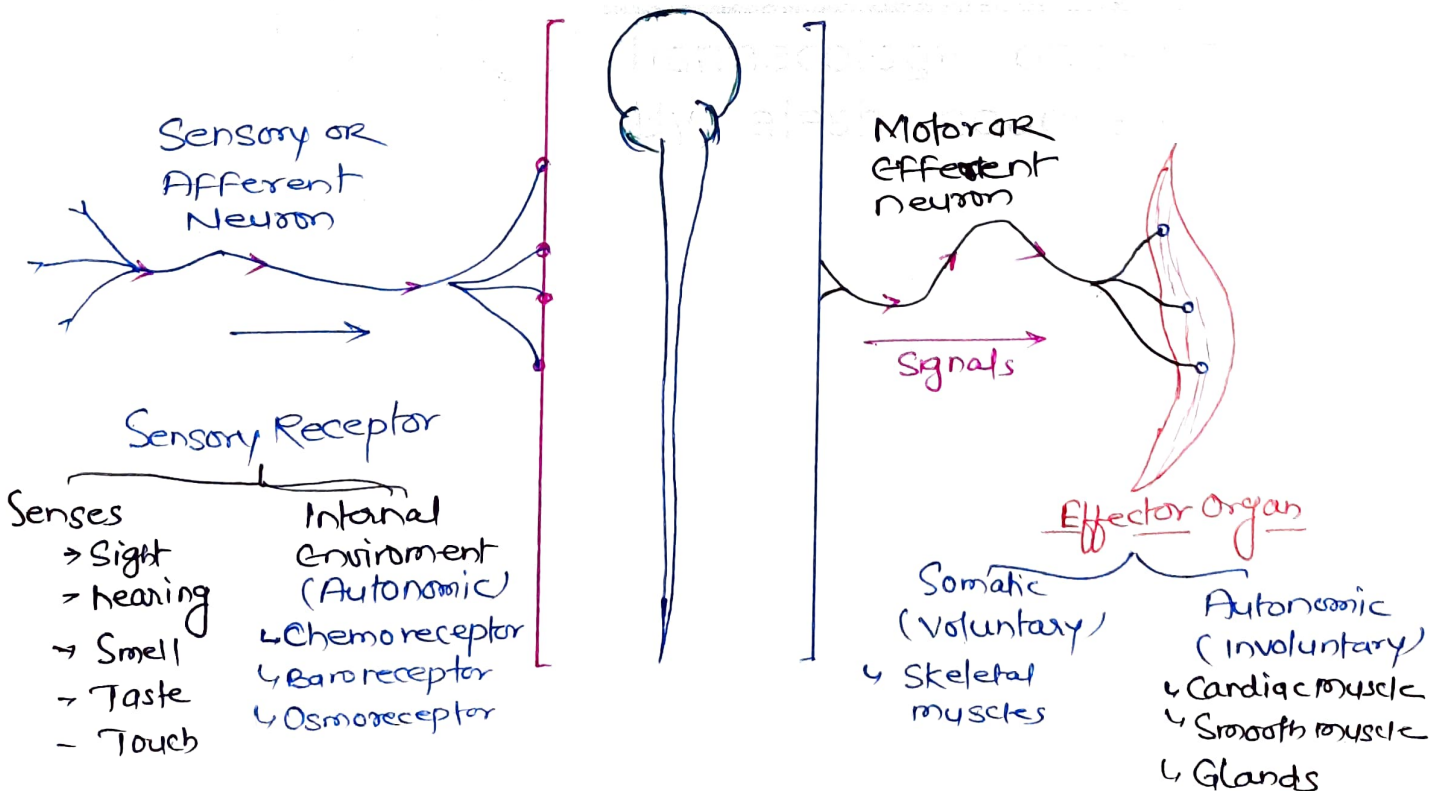
Endocrine → slower & prolonged Response



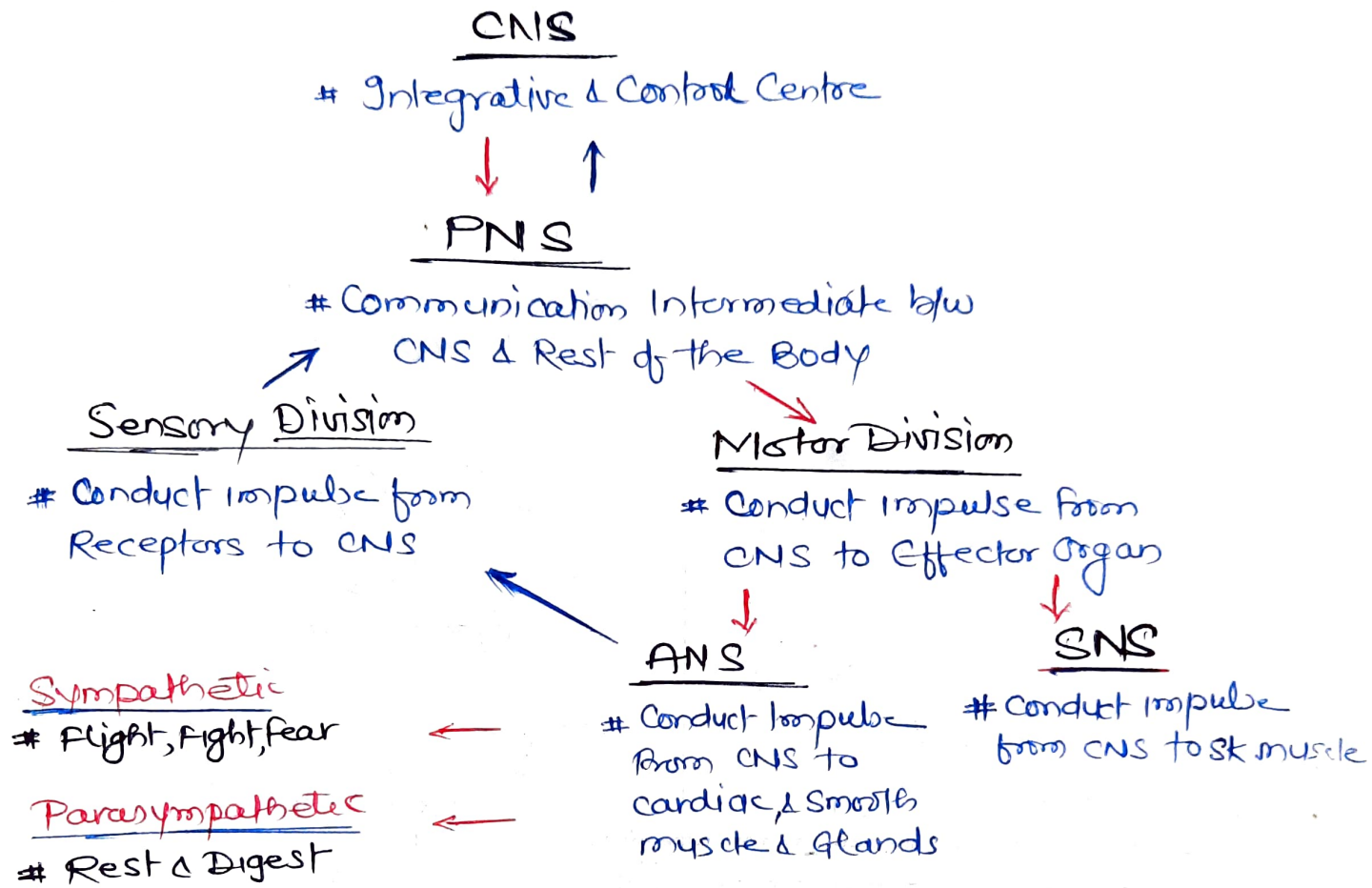
PNS (Sensory Division)

CNS

PNS (Motor Division)



Anatomical & Physiological Aspects of NS.



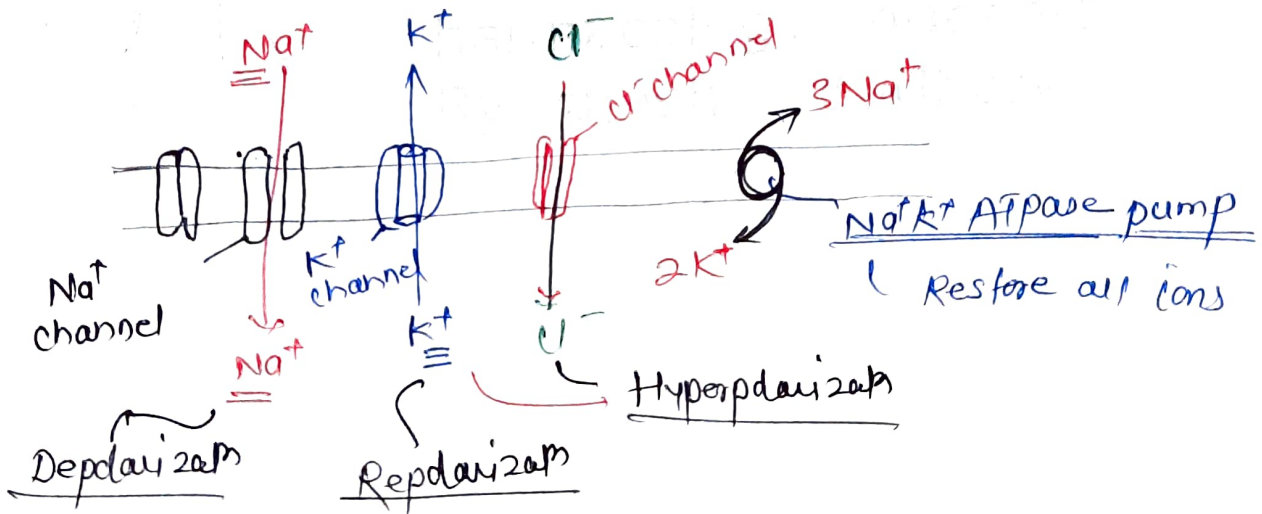
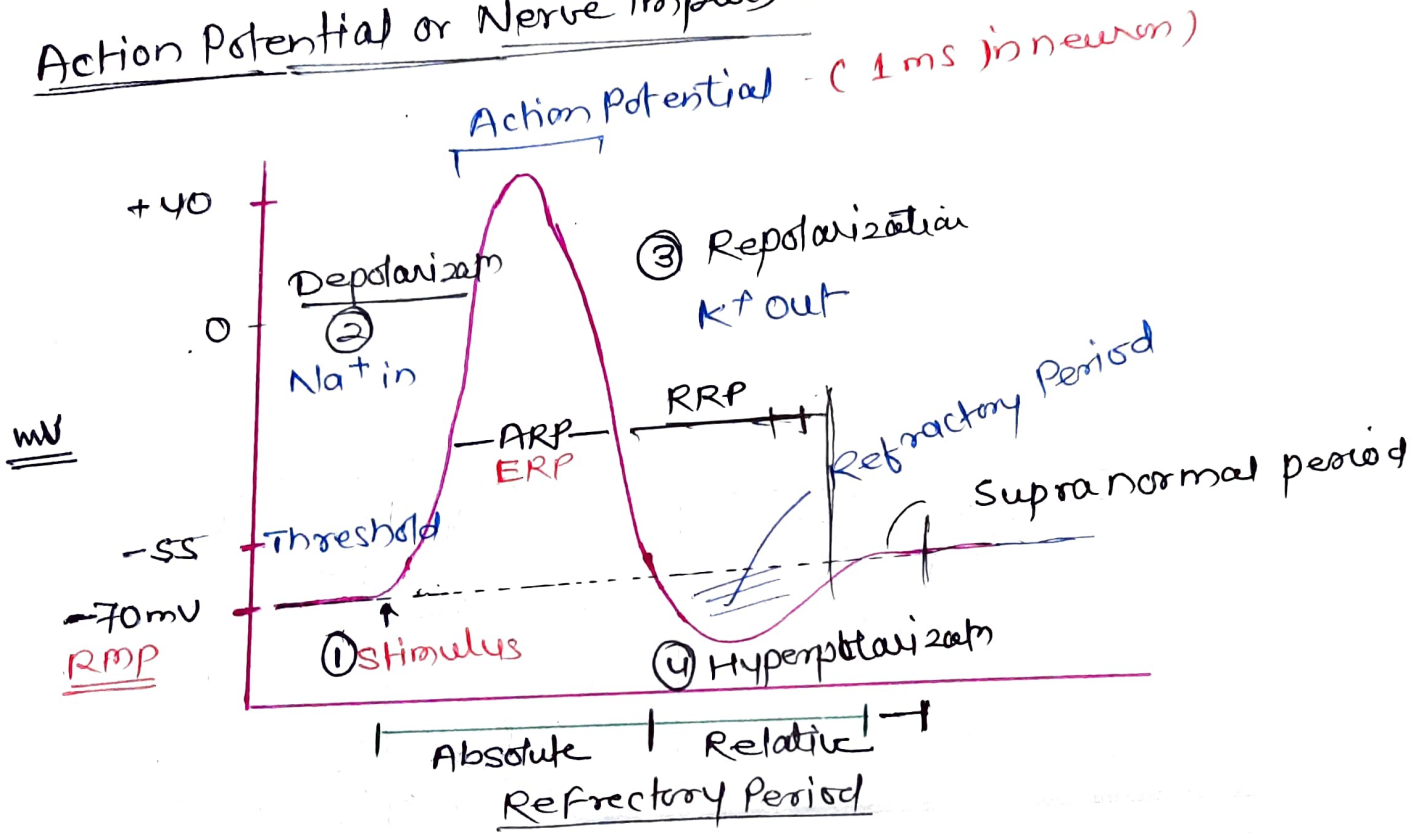
CELLS :→

- ① Neuron (Nerve Cells) - Excitable & Conductive Signaling cell
 - ② Glial or Neuroglia → Non-Excitable Supporting cells to provide Support, & metabolic activity.
- # Details of these cells are discussed in Nervous tissue chapter.

NEURONAL SIGNALING:

- ↳ Electrophysiology & Action Potential (Nerve impulse)
- ↳ Neuronal Junction (Synaps) & Signaling
- ↳ Neurotransmitters

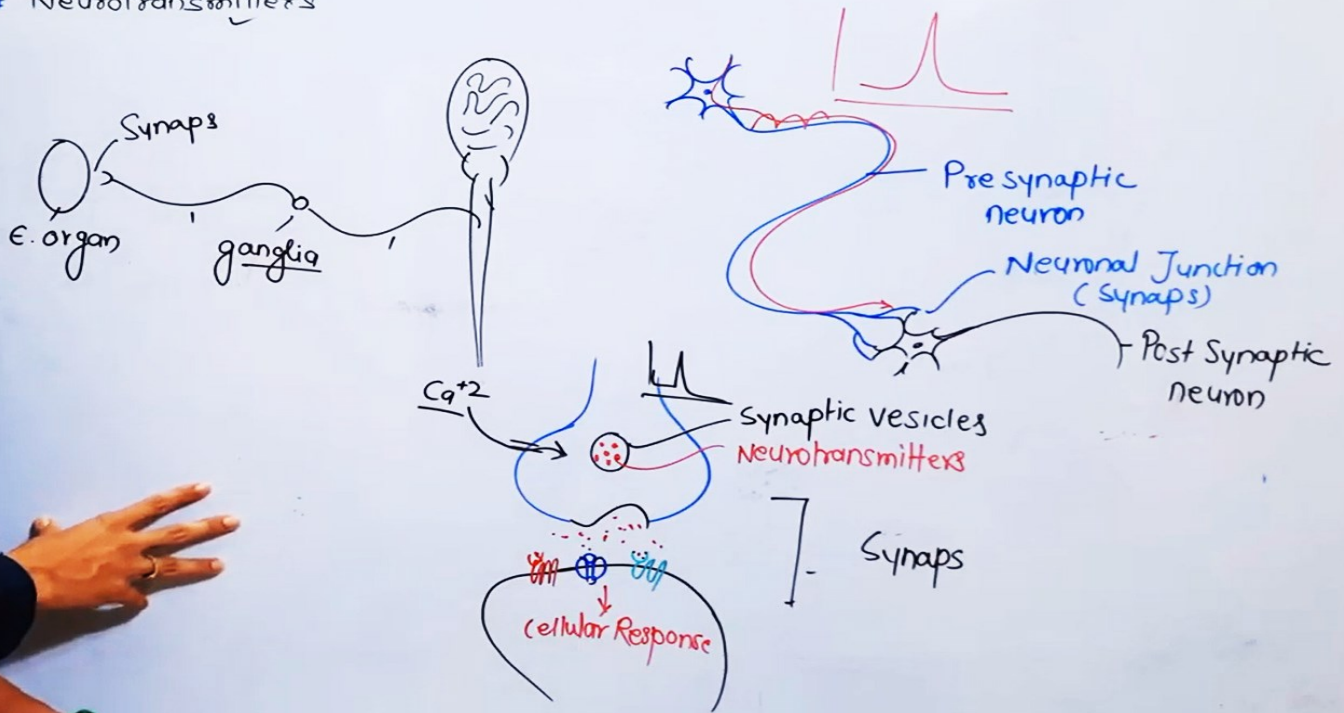
Action Potential or Nerve Impulse



- ↳ Action Potential - Transmission of impulse due to movement of ions across the nerve cell membrane
- ↳ Resting mem. potential - potential energy at resting state
In neuron - -70 mV RMP

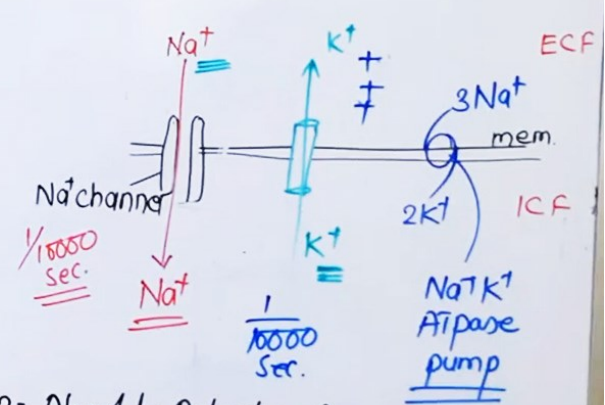
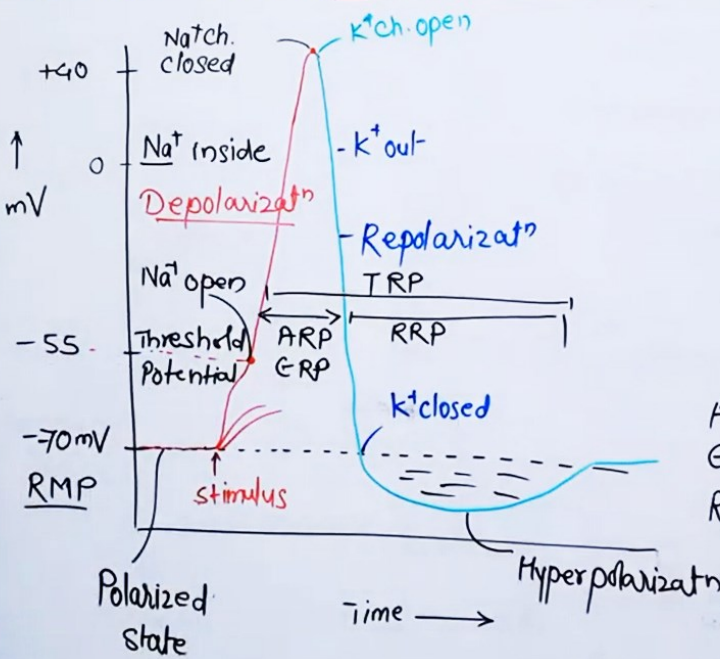
NERVOUS SYSTEM : NEURONAL SIGNALING

- # ELECTROPHYSIOLOGY, ACTION POTENTIAL (NERVE IMPULSE)
- # Neurochemical Transmission (Neurotransmission) Δ Synaps
- # Neurotransmitters

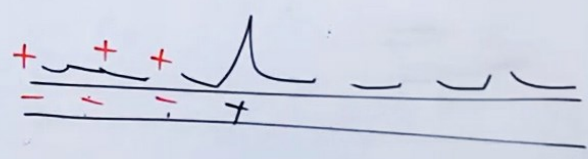


NERVOUS SYSTEM : NEURONAL SIGNALING

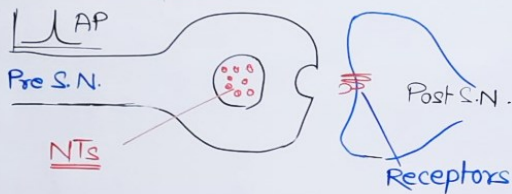
- # ELECTROPHYSIOLOGY, ACTION POTENTIAL (NERVE IMPULSE)



ARP = Absolute Refractory Period
 ERP = Effective Refractory Period
 RRP = Relative Refractory Period



NERVOUS SYSTEM : NEURONAL SIGNALING, # NEUROTRANSMITTERS



NTs = are endogenous chemical substance which released by neuron, produce a specific cellular response after binding its receptors located at mem. of adjacent neuron or cell.

Response - Excitatory or Inhibitory

CRITERIA: - 1) Present at nerve ending in synaptic vesicles.

- 2) Released on stimulatiⁿ of the nerve
- 3) Identical Effects
- 4) Metabolic Enz should be present in neuron

Type - 1) Excitatory → Aspartate, Glutamate
 2) Inhibitory → GABA, Glycine
 3) Others - Dopamine, Histamine, Serotonin, Nor-Adrenaline, Acetylcholine

NTs	Receptor	Cellular Effects
Aspartate	NMDA-R	- ↑ Cation conduction → Excitation
GABA	GABA _A -R	↑ Cl ⁻ Conduction ↓ CNS Activity, sleep
Ach -	M ₂ -R -	↓ Cardiac Activity
	M ₁ -R -	GI Secretion
	NM-R -	Skeletal Mus contraction
Nor-Ad -	α ₁ -R →	↑ BP
	β ₁ -R -	↑ Cardiac Activity
Dopamine -	D-R =	Motor co-ordinati ⁿ
Serotonin -	5HT-R -	Mood, Sleep, Wakefulness
Histamine -	H ₁ -R →	Inflammatory Response
	H ₂ -R →	GI Acid Secretion

} - PNS

} - PNS