

# Theories of PAIN <sup>1091</sup> [ ]

- ① Specificity theory - Max Von FREY
- ② Pattern theory → John Paul Nafe

Specificity theory → ise theory na Phantom limb pain ko Explain nhi Kiya

② Pattern → Every Receptor can carry Every information

\* Sensation ke Pattern or intensity ki madad se ~~ke~~ batata hai ki Kis cheez ki Sensation

③ PAIN Gate theory

# SPECIFICITY THEORY.

the specificity theory of pain was developed by  
Max von Frey in 1895

the statement of this theory is that the brain has the completely separate area and system for perceiving pain, as it does for vision and hearing

Frey stated that pain is transmitted from independent nerve endings in the skin

Pain signals then travel along dedicated pathways to a specific part of the brain called the

"PAIN CENTRE"

the brain processes the information in the pain centre which creates the sensation of pain

the specificity theory is no longer widely  
excepted it has been discredited by the  
study of Phantom x Limb pain

People who have undergone Amputation of the  
limb, may still report pain or other  
sensations that come from the missing  
limb [Phantom limb pain]

the specificity theory of pain is not supported  
in the case of Phantom limb pain,

As there is no longer any tissue from which  
the individual should be receiving pain signal  
therefore, no pain could be experienced

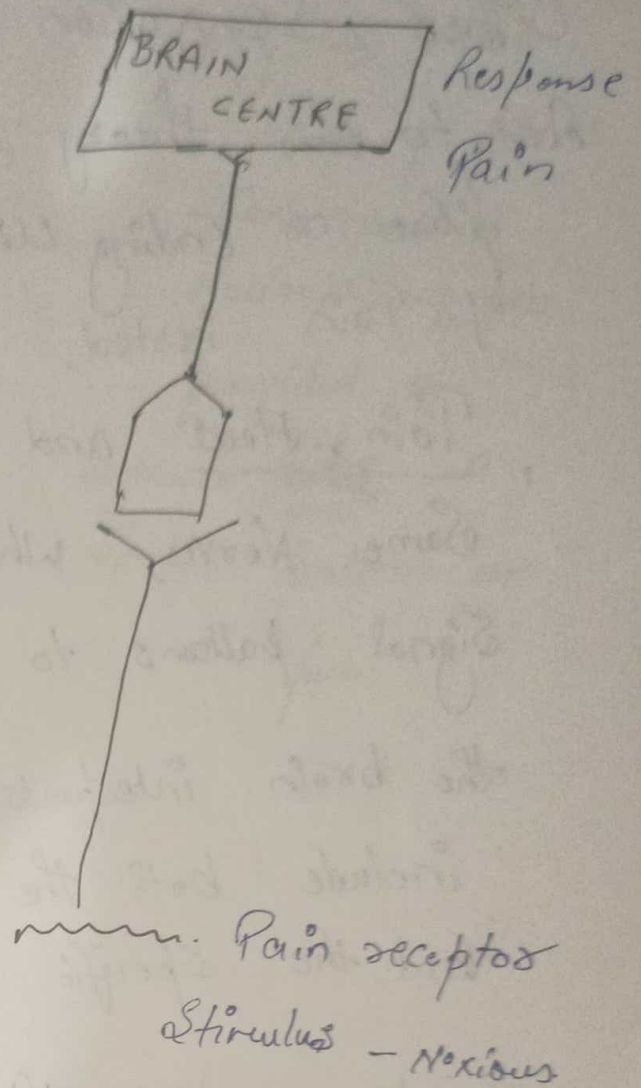
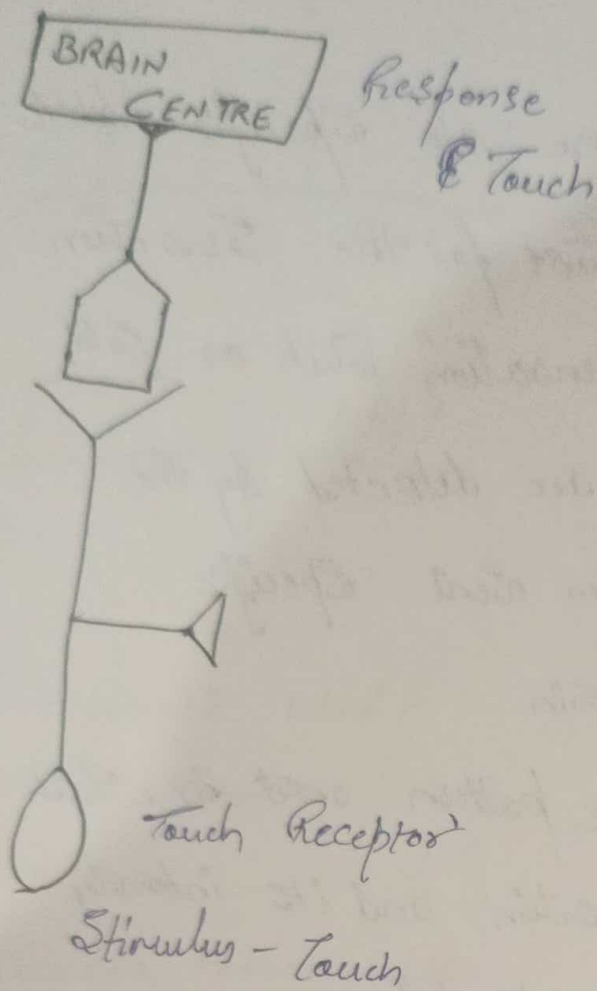


Fig → Specialized Somatosensory Receptor  
respond optimally to specific type  
of Stimuli

## PATTERN THEORY

The Pattern theory of Pain was presented by  
"John Paul Nafe" in 1929 the  
pattern theory of Pain suggest that the  
Nerve involve in detecting Pain Also defect

## Other Sensation

Acc to this theory there are no specific nerve fibres or ending used just for the sensation of Pain insted, diff sensation such as Cold, Pain, Heat and Touch are detected by the same Nerves, which then sent specific signal patterns to the brain

the brain interprets the pattern ~~and its~~ which include both the sensation and its intensity and the specific sensation is felt

Scientist used this theory to help to explain

Phantom limb pain which is Neuro-pathic Pain experienced After a limb or part of a limb has been removed

However the pattern theory of Pain was disapproved when scientist discover that these are unique nerve Receptor for Each type of sensation including Pain.

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# PAIN GATE CONTROL THEORY

or

## PAIN MODULATION

The Gate Control theory of Pain modulation was first proposed by Melzack and WALL in 1965

The modulation of Pain Requires peripheral or Central interventions on the classic Spinal pain gating system

Acc to the ~~Pain~~ Gate Control Theory

Pain is Perceived only if the Spinal gate is open it thus follows that to suppress the perception of Pain, we need therapeutic intervention designed to close this gate

Pain modulation caused by Sensory stimulation and the resultant increase in the impulses in the large Diameter [A-beta] Afferent fibres was proposed by the gate control theory of Pain. Impulses ascending on these fibres stimulate the Substantia gelatinosa as they enter the dorsal horn of the SC.

• Stimulation of the Substantia gelatinosa inhibits synaptic transmission in the large and small [A-delta - C-fibre] Afferent pathways.

• The Pain Message carried along the smaller Diameter! the fibres is not transmitted

to the 2<sup>o</sup> order neuron & Next Reaches  
Sensory Centers

th. Rubbing a Contusion, Applying Moist Heat  
or massaging sore muscle dec the  
Perception of Pain the Analgesic  
Response to these treatment is attributed to  
the inc stimulation of large diameter  
Afferent fibers (A-beta)

- the Gate Control theory Proposed a  
Second Analgesic Mechanism that involves  
descending Efferent fibers.

The Central Control originating in higher  
Centre of the Central Nervous System  
could affect the dorsal horn gating process

- impulses from the Trigeminal and Brain  
Stem [Central biasing] are carried into  
the Dorsal Horn.



— Impulses from the higher centre act to close the gate and block transmission of the Pain message at the Dorsal Horn Synapse

Based on the spinal gating mechanism it logically follows that to close the gate [to Suppress Pain] a greater neural activity must be present in the larger A-beta Affluent fibres.

A greater neural activity along the A-beta fibres will activate the inhibitory neuron  
↓  
(Inter Neuron)

These neurons will then induce a powerful inhibitory effect, causing the gate to close [Suppressing Pain]

## Mechanism of PAIN CONTROL

### ① BLOCKING ASCENDING PATHWAYS

— Stimulation from ascending A-beta Affluents results in the blocking of impulses carried along A-delta and C-Affluent fibres

## ② Blocking Descending Pathways

Stimulation of Descending Pathways in the Dorsal-lateral tract of the Spinal Cord by A-delta & C-fibres Affluent input Results in a blocking of the impulses Carried Along the A-delta & C-Affluent fibres

\* The Stimulation of A-delta & C-Affluent Causes the Release of Endogenous Opioids Resulting in a Prolonged Activation of ~~Down~~ Descending Analgesic Pathway

NOTE → The Analgesia following the Use of Transcutaneous Electrical Nerve Stimulator

[T.E.N.S] is Attributed to PAIN GATE

CONTROL MECHANISM