COURSE NAME : CLINICAL NEUROLOGY

COURSE CODE : 746285

TITLE : NEUROPHYSIOLOGY – PART II

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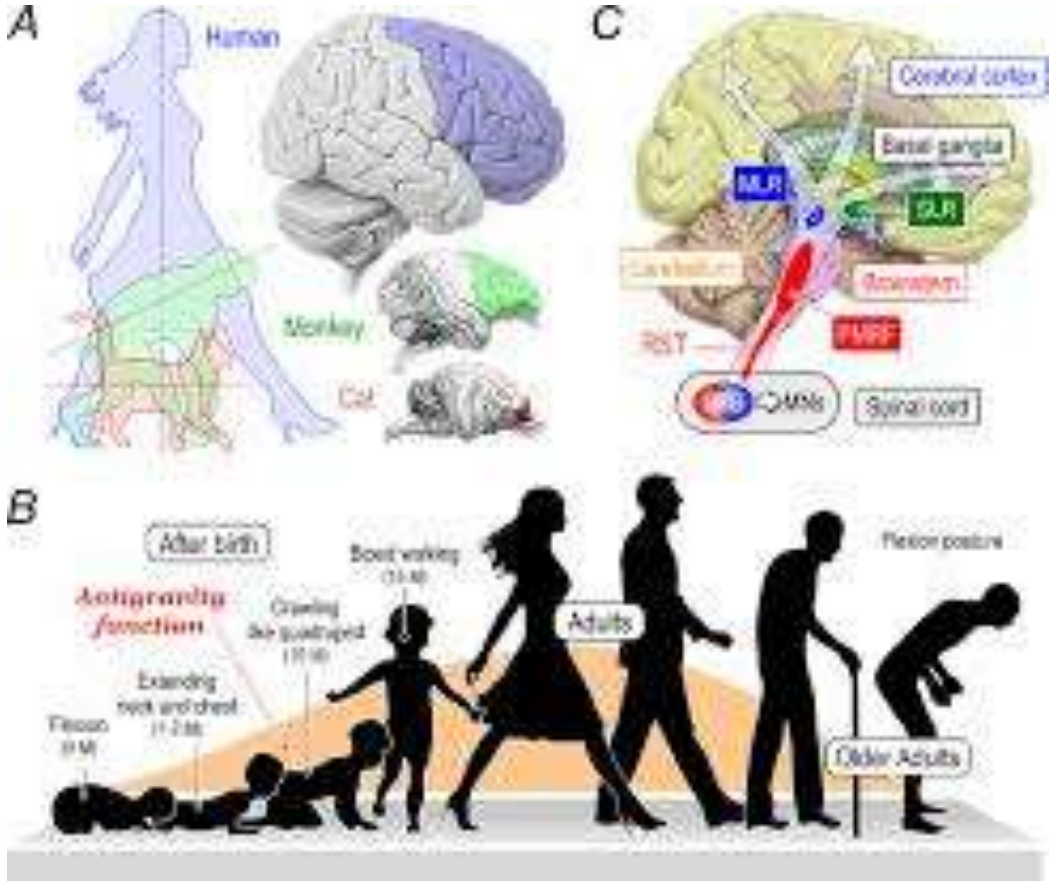
DESIGNATION : ASSOCIATE PROFESSOR

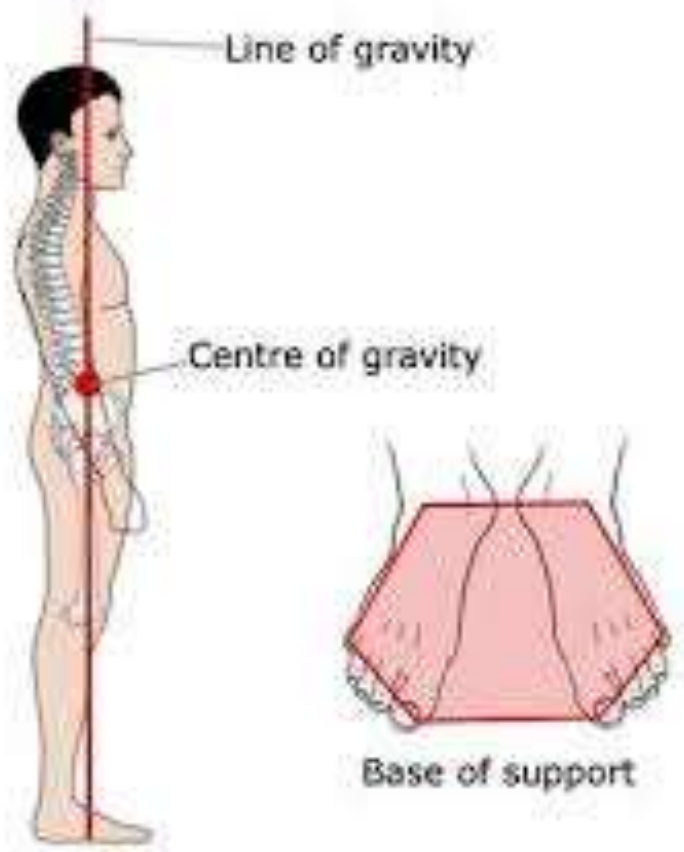
POSTURE

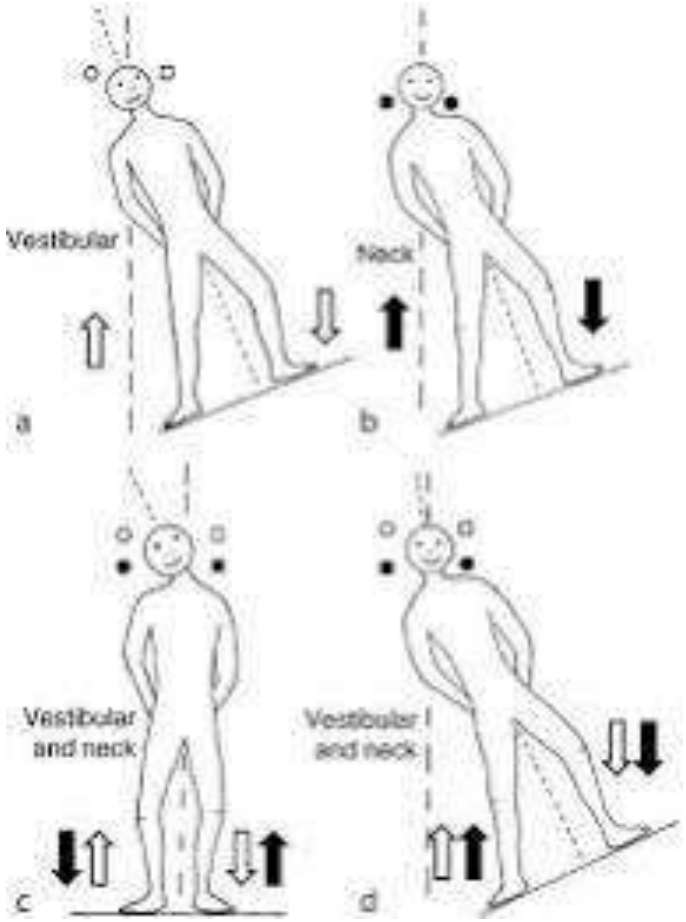
Types of posture:

- **Static posture**
- The body and its segments are aligned and maintained in certain positions

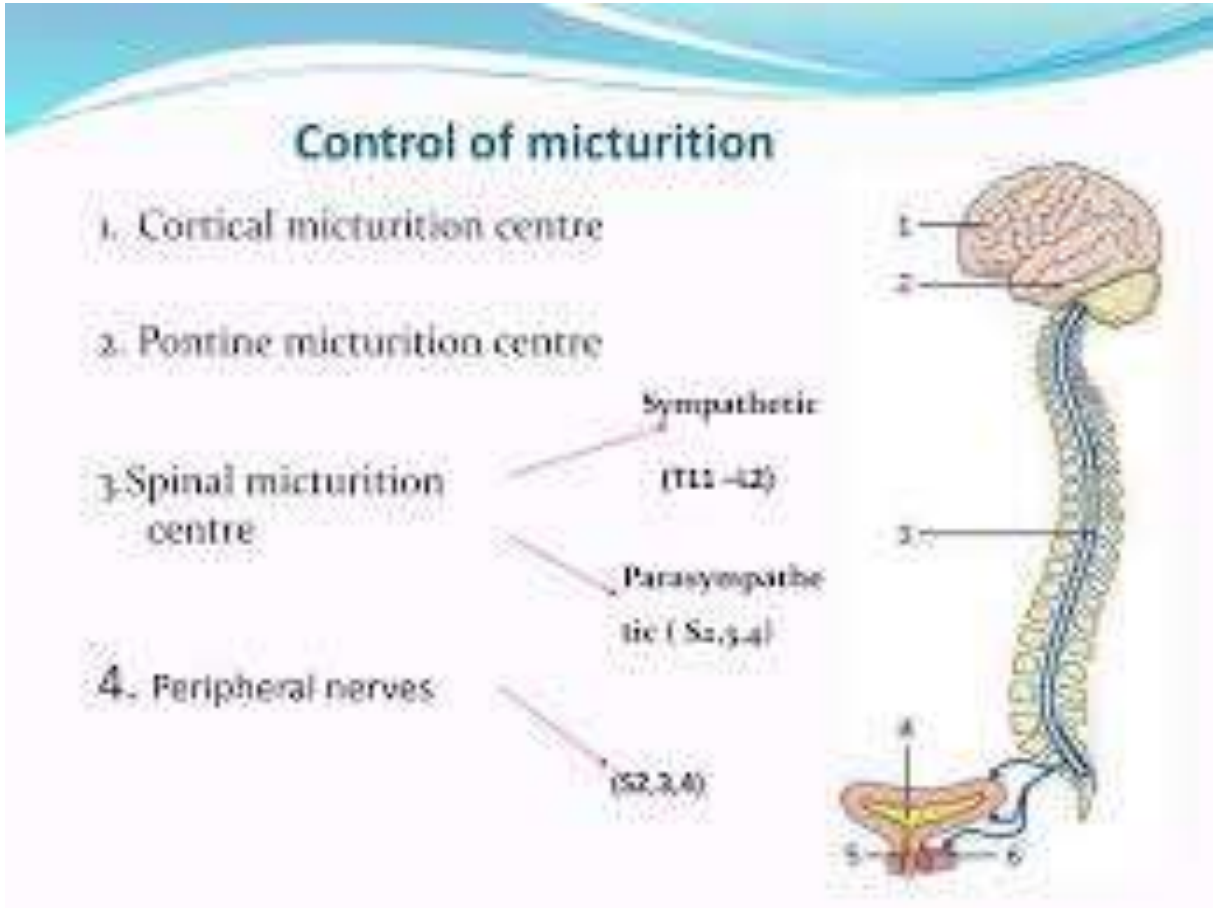
- **Dynamic posture**
- Refers to postures in which the body or its segments are moving.

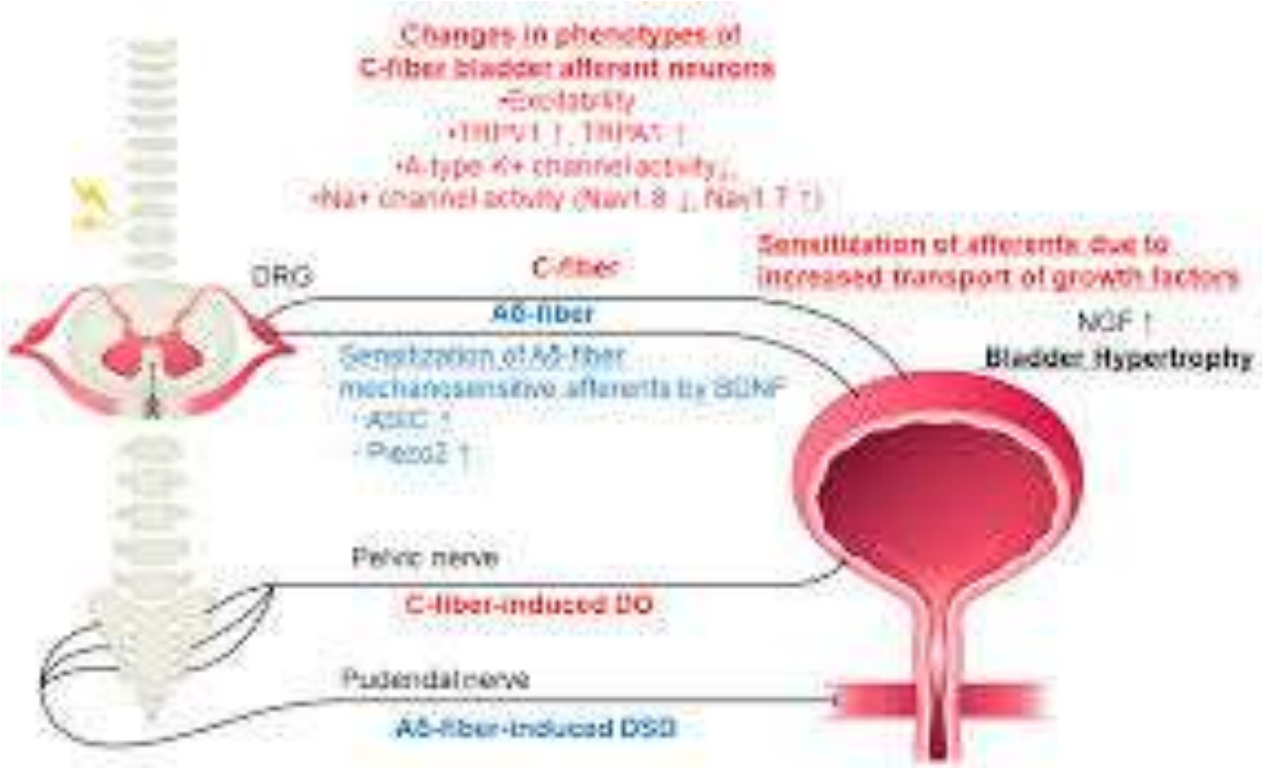

A
Human
Monkey
Cat
C
Cerebral cortex
Basal ganglia
MLR
DLR
Cerebellum
Brainstem
RST
VRST
CM/Pf
Spinal cord
B
After birth
Antigravity function
Crawling
Extending neck and chest
Flexion
Adults
Flexion posture
Older Adults


Line of gravity
Centre of gravity
Base of support

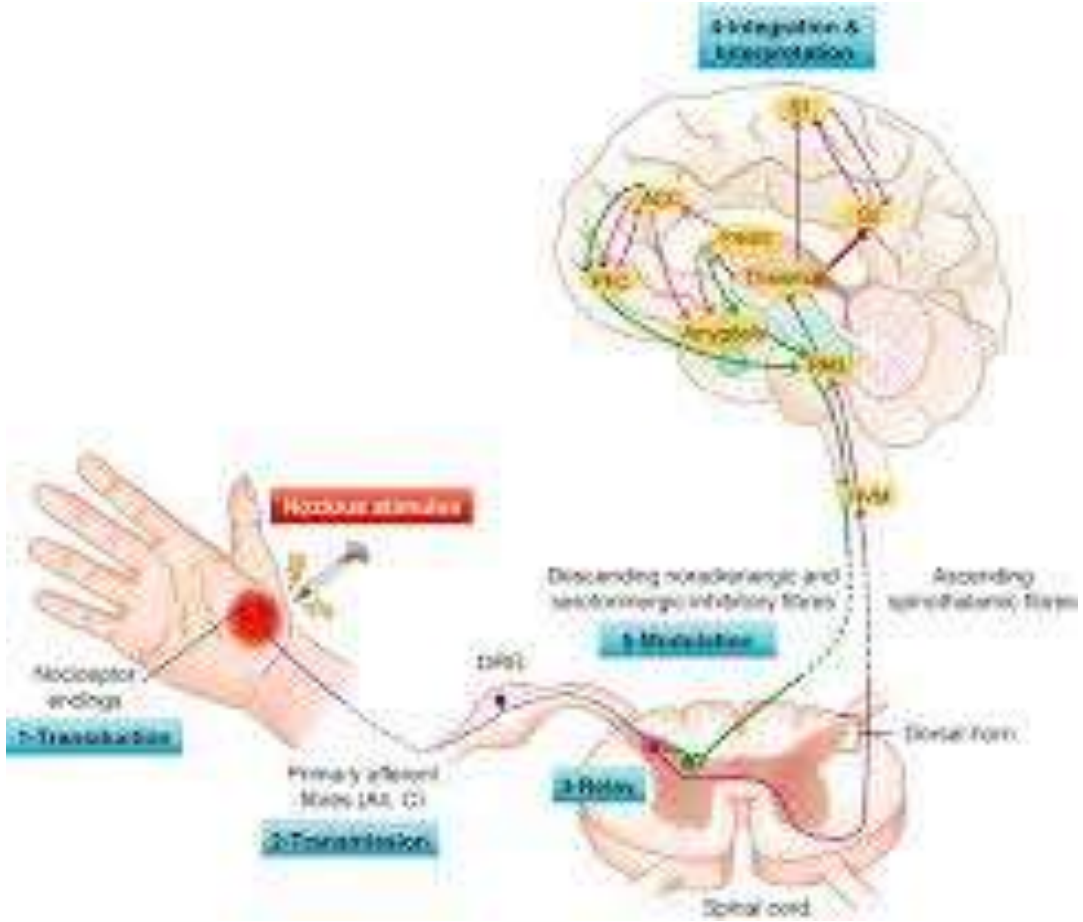

Vestibular
a
Neck
b
Vestibular and neck
c
Vestibular and neck
d

MICTURITION




Changes in phenotypes of
C-fiber bladder afferent neurons
-Excitability
+TRPV1 ↑, TRPA1 ↑
+A-type K+ channel activity ↓
+Na+ channel activity (Nav1.8 ↓, Nav1.7 ↑)
Sensitization of afferents due to
increased transport of growth factors
NGF ↑
Bladder Hypertrophy
DRG
C-fiber
Aδ-fiber
Sensitization of Aδ-fiber
mechanosensitive afferents by BDNF
- ASIC ↑
- Piezo2 ↑
Pelvic nerve
C-fiber-induced DO
Pudendal nerve
Aδ-fiber-induced DSD

PAIN


Nociceptor endings
Primary afferent fibers (Aδ, C)
Dorsal horn
Spinal cord


PAIN
PATHWAYS
BRAIN
START
HERE
PERIPHERY

INCLASS ASSESSMENT

1. **Postural control in quiet standing primarily depends on integration of:**
   A. Visual, vestibular, and somatosensory inputs within brainstem and cerebellar networks
   B. Visual input only at the level of the occipital cortex
   C. Proprioceptive input only at the level of the spinal cord
   D. Vestibular input only at the level of the inner ear

2. **Neural control of bladder EMPTYING (voiding) is mediated mainly by:**
   A. Sympathetic outflow from T11–L2 activating β-adrenergic receptors in the detrusor
   B. Parasympathetic outflow from S2–S4 via pelvic nerves activating muscarinic receptors in the detrusor
   C. Somatic outflow via pudendal nerve to external urethral sphincter only
   D. Corticospinal tract directly innervating detrusor muscle

3. **During storage phase of the micturition cycle, the dominant neural influence is:**
   A. Parasympathetic excitation of detrusor muscle
   B. Sympathetic inhibition of detrusor and excitation of bladder base and proximal urethra
   C. Complete absence of autonomic activity
   D. Activation of pontine micturition center to trigger voiding

INCLASS ASSESSMENT

4. **The primary descending motor pathway responsible for execution of skilled, fractionated voluntary movements of the distal limbs is:**
   A. Reticulospinal tract
   B. Vestibulospinal tract
   C. Corticospinal (pyramidal) tract
   D. Rubrospinal tract

5. **In the classic nociceptive pain pathway, fast, well-localized "first pain" is mainly carried by:**
   A. Unmyelinated C fibers projecting in the paleospinothalamic tract
   B. Aβ fibers projecting in the dorsal column–medial lemniscus system
   C. Lightly myelinated A-delta fibers projecting in the neospinothalamic tract
   D. Autonomic efferent fibers projecting to sympathetic ganglia

INCLASS ASSESSMENT

ANSWERS

1. A. Visual, vestibular, and somatosensory inputs within brainstem and cerebellar networks.
2. B. Parasympathetic outflow from S2–S4 via pelvic nerves activating muscarinic receptors in the detrusor.
3. B. Sympathetic inhibition of detrusor and excitation of bladder base and proximal urethra.
4. C. Corticospinal (pyramidal) tract.
5. C. Lightly myelinated A-delta fibers projecting in the neospinothalamic tract.

THANK YOU!!!!

References Books:

- Hankey Greame - Clinical Neurology
- Bickerstaff - Clinical Neurological Examination
- Dejongs - Neurological Examination
- Demyers - The Neurologic Examination
- Snell - Clinical Neuroanatomy - 7th Ed
- Satish Khadilker - Neuromuscular Disorders
- Vishram Singh - Texbook of Clinical Neuro Anatomy 2nd edition
- Kenneth W. Lindsay - Neurology and Neurosurgery Illustrated