DEEP TENDON REFLEXES

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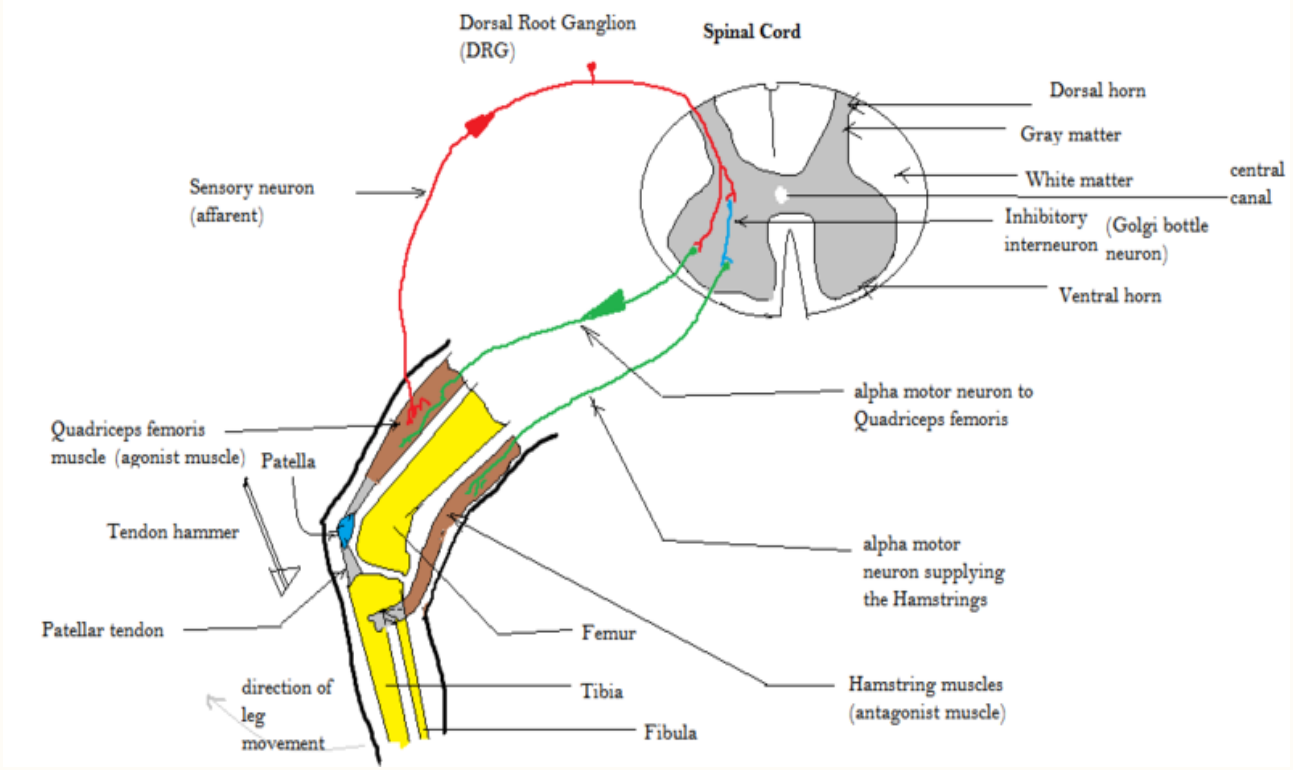
DEEP REFLEXES

Deep reflexes are muscle stretch reflexes mediated by lower motor neuron (LMN) pathways, typically monosynaptic

A monosynaptic reflex, such as the knee jerk reflex, is a simple reflex involving only one synapse between the sensory and motor neuron



KNEE JERK REFLEX

- Can be elicited in lying or sitting position
- Subject should be calm and comfortable
- Strike the patellar tendon with hammer, after exposing the thigh region
- Note contraction of quadriceps femoris resulting in extension of knee

- ROOT VALUE: L2-L4

ANKLE JERK REFLEX

- also known as the Achilles reflex
- Elicited in supine posture
- Lower limb everted and slightly flexed
- With one hand, slightly dorsiflex the foot
- Strike the tendon of gastrocnemius/calf muscle
- Note contraction of calf muscle leading to planter flexion of ankle joint

- ROOT VALUE: S1-S2

BICEPS JERK

- Elbow flexed to a right
- Forearm placed in semi pronated position
- Place your thumb or index finger on biceps tendon and strike it with hammer
- Note the contraction of biceps muscle leading to flexion at elbow joint

- ROOT VALUE: C5-C6

TRICEPS JERK

- Elbow is flexed
- Forearm placed across the subject's chest or support the forearm in semiflexed position
- Tap triceps tendon just above the olecranon
- Note the contraction of triceps muscle leading to extension at elbow joint

- ROOT VALUE: C6-C7

SUPINATOR (BRACHIORADIALIS) REFLEX

- Elbow is flexed
- Forearm placed in semi pronated position
- Tap brachioradialis tendon upon styloid process of radius
- Supinator muscle contracts leading to supination of elbow

- ROOT VALUE: C6

JAW JERK

- Ask subject to open his mouth a bit
- Place one finger on his chin and tap it
- Masseter contracts resulting in closure of jaw

- ROOT VALUE: CN 5

JENDRASSIK MANEUVER

- also called reinforcement
- method for enhancing sluggish tendon-tap jerks at medical examination
- in which the patient clenches the teeth, flexes both sets of fingers into a hook-like form, and interlocks those sets of fingers together

Clinical Relevance – Testing Reflexes

Reflex	Spinal Levels
Biceps reflex	C5/C6
Brachioradialis reflex	C6
Triceps reflex	C6-C8
Patellar reflex	L2-L4
Achilles reflex	S1/S2

- When testing reflexes it is important to know which spinal root level you are testing.

- If the reflex is not present it could be due to a problem with the receptor, the spinal cord, the motorneuron, the neuromuscular junction or the muscles.

- It is also important to look for hyperreflexia (UMN sign) or hyporreflexia (LMN sign)

Upper Motor Neuron (UMN) vs. Lower Motor Neuron (LMN) Syndrome

	UMN syndrome	*LMN Syndrome*
Type of Paralysis	*Spastic Paresis*	*Flaccid Paralysis*
Atrophy	No (Disuse) Atrophy	Severe *Atrophy*
Deep Tendon Reflex	*Increase*	Absent DTR
Pathological Reflex	Positive *Babinski* Sign	Absent
Superficial Reflex	Absent	Present
Fasciculation and Fibrillation	Absent	Could be *Present*

GRADING OF REFLEXES

- Grade 0: Absent
- Grade 1: Present
- Grade 2: Brisk
- Grade 3: Very brisk
- Grade 4: Clonus

CLONUS

- Clonus is a series of involuntary, rhythmic, muscular contractions and relaxations
- When deep reflexes are exaggerated the phenomena of Clonus is elicitable
- Clonus indicates UMN lesion and is indicative of hyperreflexia

ANKLE CLONUS

- The knee of the subject is slightly flexed along with the hip joint
- Hold the anterior part of foot with other hand
- Give two or three dorsiflexion sharp movements to the foot
- A series of contraction of muscle and ankle joint movements are seen when ankle clonus is positive

PATELLAR CLONUS

- The subject is asked to lie supine
- Tendon of quadriceps femoris muscle is held at upper border of patella
- 2-3 sudden jerks are given downward to stretch quadriceps femoris muscle
- A series of contractions of quadriceps occur when patellar clonus is positive

CAN YOU ANSWER?

– knee jerk reflex is an example of

a) Monosynaptic reflex

b) Polysynaptic reflex

– knee jerk reflex is an example of

a) Monosynaptic reflex (CORRECT)

b) Polysynaptic reflex

References:

- https://teachmephysiology.com/
- Essentials of medical physiology, sixth edition

Thank You