



PHYSIOCITY

Dermatomes & Myotomes

Spinal Segmental Testing • Maps, Reflexes, Clinical Case Studies & MCQs

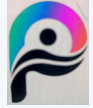
Physiotherapy

MBBS

BPT / MPT

OSCE Practicals

Compiled for clinical & academic learning



What This Deck Covers

01

Definitions

What is a dermatome vs. a myotome

02

Dermatome Map

C2 – S5 sensory landmarks

03

Myotome Map & MRC Grading

Root → muscle action → reflex

04

Deep Tendon Reflexes

Biceps, triceps, patellar, Achilles

05

4 Clinical Case Studies

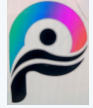
Cervical, lumbar, sacral radiculopathy + red flag

Quick Definitions

Dermatome – an area of skin supplied by sensory fibers from a single spinal nerve root.

Myotome – a group of muscles innervated by the motor fibers of a single spinal nerve root.

Together they let clinicians localize a spinal nerve root lesion using sensory + motor + reflex testing.



Dermatome vs. Myotome



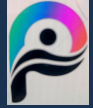
Dermatome

- Sensory (afferent) territory of ONE spinal nerve root
- Tested with light touch, pinprick, or a sharp/blunt tool
- Adjacent dermatomes overlap – total loss of a single root rarely causes complete numbness
- Mapped from C2 (occiput) to S5 (perianal)



Myotome

- Motor (efferent) territory of ONE spinal nerve root
- Tested with resisted isometric muscle contraction
- Most muscles receive fibers from 2–3 roots – weakness is usually partial, not complete
- Graded using the MRC 0–5 manual muscle testing scale

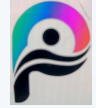


Which statement best distinguishes a myotome from a dermatome?

- A A myotome is a skin area; a dermatome is a muscle group
- B A dermatome is the sensory territory of a spinal root; a myotome is the motor territory of a spinal root** ✓ CORRECT
- C Dermatomes and myotomes always share identical root numbers for the same body region
- D Myotomes are tested with light touch, dermatomes with resisted contraction

EXPLANATION

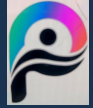
A dermatome = sensory (afferent) skin area for a single nerve root. A myotome = motor (efferent) muscle group for a single nerve root. Testing dermatomes uses sensory modalities (touch/pinprick); testing myotomes uses resisted isometric contraction.



Dermatome Map – C2 to S5

Root	Key Landmark
C2	Occiput / back of head
C3	Supraclavicular fossa / upper neck
C4	Top of shoulder (acromioclavicular joint)
C5	Lateral arm, over deltoid
C6	Thumb & lateral forearm
C7	Middle finger
C8	Little finger & medial forearm
T1	Medial forearm / elbow
T4	Nipple line
T7	Xiphoid process

Root	Key Landmark
T10	Umbilicus
T12	Inguinal ligament / pubic symphysis
L1	Inguinal region
L2	Anterior / medial thigh
L3	Medial knee
L4	Medial malleolus / medial leg
L5	Dorsum of foot & big toe
S1	Lateral foot, little toe & heel
S2	Posterior thigh
S3–S5	Perianal / saddle region



MCQ CHECKPOINT

Dermatome Map

A patient has reduced sensation at the umbilicus (belly-button level). Which spinal nerve root dermatome does this correspond to?

A T4

B T7

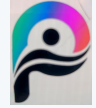
C T10

✓ CORRECT

D T12

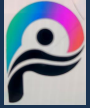
EXPLANATION

T10 is the classic landmark dermatome at the umbilicus. T4 corresponds to the nipple line and T7 to the xiphoid process — useful vertical landmarks for grading a sensory level.



Myotome Map – Root, Action & Reflex

Root	Key Action Tested	Associated Reflex
C1–C2	Neck flexion	—
C3	Neck lateral flexion	—
C4	Shoulder elevation (shrug)	—
C5	Shoulder abduction (deltoid), elbow flexion	Biceps
C6	Wrist extension, elbow flexion	Biceps / Brachioradialis
C7	Elbow extension, wrist flexion	Triceps
C8	Thumb extension / finger flexion	—
T1	Finger abduction (interossei)	—
L2	Hip flexion	—
L3	Knee extension	Patellar (knee jerk)
L4	Ankle dorsiflexion	Patellar (knee jerk)
L5	Great toe extension (EHL)	— (no reliable DTR)
S1	Ankle plantarflexion & eversion	Achilles (ankle jerk)
S2	Knee flexion	Achilles (ankle jerk)



You ask a patient to extend their great toe against resistance to test which myotome?

A L3

B L4

C L5

✓ CORRECT

D S1

EXPLANATION

Extensor hallucis longus (great toe extension) is the standard bedside test for the L5 myotome, which notably lacks a reliable deep tendon reflex of its own.



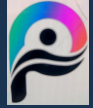
MRC Muscle Power Scale & Key DTRs

MRC MANUAL MUSCLE TESTING (0–5)

- 0** No contraction at all
- 1** Flicker / trace of contraction
- 2** Active movement, gravity eliminated
- 3** Active movement against gravity
- 4** Active movement against gravity + some resistance
- 5** Normal power against full resistance

DEEP TENDON REFLEXES (DTR)

Reflex	Root
Biceps reflex	C5–C6
Brachioradialis reflex	C6
Triceps reflex	C7–C8
Patellar / knee jerk	L3–L4
Achilles / ankle jerk	S1–S2



MCQ CHECKPOINT

MRC Grading & Reflexes

A patient can move their ankle through full dorsiflexion range only when gravity is eliminated (side-lying), but cannot lift against gravity. What MRC grade is this?

A Grade 1

B Grade 2

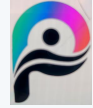
✓ CORRECT

C Grade 3

D Grade 4

EXPLANATION

MRC Grade 2 = active movement is possible through full range only when gravity is removed from the equation (e.g., moving sideways rather than up against gravity).



C6 Nerve Root Compression

PATIENT PROFILE

45-year-old male, desk worker

CHIEF COMPLAINT

Neck pain radiating down the lateral arm into the thumb for 3 weeks, worse with neck extension and rotation to the right.

CLINICAL FINDINGS

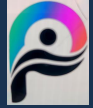
- Sensory: reduced pinprick/light touch over the thumb & lateral forearm
- Motor: weak wrist extension and elbow flexion (MRC 4/5)
- Reflex: diminished biceps and brachioradialis reflex
- Positive Spurling's test reproduces arm pain

PHYSIOTHERAPY MANAGEMENT

Cervical traction / mechanical decompression, nerve gliding (median nerve slider), deep neck flexor strengthening, posture correction, activity modification.

DIAGNOSIS

Right C6 radiculopathy, most commonly from a C5–C6 disc herniation or foraminal stenosis.



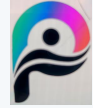
Which reflex and dermatome combination best matches a C6 radiculopathy?

- A Triceps reflex; middle finger
- B Biceps/brachioradialis reflex; thumb**
- C Achilles reflex; lateral foot
- D Patellar reflex; medial knee

✓ CORRECT

EXPLANATION

C6 supplies the thumb/lateral forearm dermatome and mediates the biceps and brachioradialis reflexes — both are classically diminished in C6 radiculopathy.



L5 Nerve Root Compression

PATIENT PROFILE

52-year-old male, warehouse worker

CHIEF COMPLAINT

Low back pain radiating down the lateral leg to the dorsum of the foot and big toe after lifting a heavy box.

CLINICAL FINDINGS

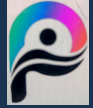
- Sensory: reduced sensation over the dorsum of the foot & big toe
- Motor: weak extensor hallucis longus (great toe extension), mild foot drop tendency
- Reflex: no reliable deep tendon reflex change (L5 has no dedicated DTR)
- Positive straight leg raise test at 40°

PHYSIOTHERAPY MANAGEMENT

McKenzie extension exercises, nerve gliding (sciatic slider), core stabilization, gait training for foot drop, ankle dorsiflexor strengthening, gait aid if drop is significant.

DIAGNOSIS

L5 radiculopathy, typically from an L4–L5 disc herniation compressing the traversing L5 root.



MCQ CHECKPOINT

Case 2 – Lumbar Radiculopathy

A patient cannot extend the great toe against resistance and has numbness over the dorsum of the foot. Which nerve root is most likely involved?

A L3

B L4

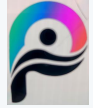
C L5

✓ CORRECT

D S1

EXPLANATION

Great toe (hallux) extension via extensor hallucis longus is the classic L5 myotome test, and the L5 dermatome covers the dorsum of the foot and big toe.



S1 Nerve Root Compression

PATIENT PROFILE

38-year-old female, runner

CHIEF COMPLAINT

Sharp pain from the buttock down the back of the leg into the lateral foot and heel; difficulty rising onto toes.

CLINICAL FINDINGS

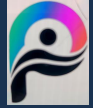
- Sensory: reduced sensation over the lateral foot, little toe and heel
- Motor: weak ankle plantarflexion and eversion; cannot perform a single-leg heel raise
- Reflex: diminished/absent Achilles (ankle jerk) reflex
- Positive straight leg raise, pain increases with ankle dorsiflexion (Bragard's sign)

PHYSIOTHERAPY MANAGEMENT

Neural mobilization (sciatic nerve slider/tensioner), calf strengthening progression, single-leg heel raise retraining, gradual return-to-running program.

DIAGNOSIS

S1 radiculopathy, commonly from an L5–S1 disc herniation.



MCQ CHECKPOINT

Case 3 – Lumbosacral Radiculopathy

Absent Achilles reflex with weak ankle plantarflexion and lateral foot numbness localizes to which nerve root?

A L4

B L5

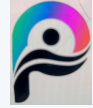
C S1

✓ CORRECT

D S2

EXPLANATION

The Achilles (ankle jerk) reflex is mediated by S1–S2, and S1 also supplies plantarflexion/eversion strength and the lateral foot/heel dermatome — the classic S1 triad.



Cauda Equina Syndrome (S3–S5)

PATIENT PROFILE

60-year-old male, sudden severe low back pain

CHIEF COMPLAINT

Bilateral leg pain and weakness, new-onset urinary retention, and numbness “where you'd sit on a saddle.”

CLINICAL FINDINGS

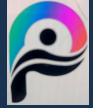
- Sensory: bilateral saddle anesthesia (S3–S5 dermatomes)
- Motor: bilateral lower limb weakness, multiple myotomes affected
- Reflex: reduced/absent ankle jerks bilaterally
- Reduced anal sphincter tone; urinary retention with overflow incontinence

PHYSIOTHERAPY MANAGEMENT

No delay for physiotherapy — immediate medical/surgical referral is mandatory. Post-operative physiotherapy later focuses on bladder/bowel retraining, gait re-education and lower-limb strengthening.

DIAGNOSIS

Cauda equina syndrome — a surgical emergency requiring immediate MRI and decompression, usually from a large central disc herniation.



MCQ CHECKPOINT

Case 4 – Surgical Emergency

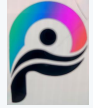
A patient reports saddle numbness, bilateral leg weakness, and new urinary retention. What is the most appropriate immediate action?

- A Start lumbar traction and reassess in a week
- B Give reassurance and home exercises
- C Urgent medical referral for same-day MRI — possible surgical emergency**
- D Prescribe NSAIDs and review in 2 weeks

✓ CORRECT

EXPLANATION

Saddle anesthesia with bladder/bowel dysfunction and bilateral leg signs are red flags for cauda equina syndrome, which requires emergency imaging and often surgical decompression to prevent permanent damage.



Red Flags in Radiculopathy Assessment



Saddle anesthesia

Bilateral S3–S5 numbness → possible cauda equina syndrome



Bladder / bowel dysfunction

Retention or incontinence → emergency referral



Bilateral leg weakness

Multiple myotomes involved → urgent imaging



Progressive neurological deficit

Worsening power/sensation despite rest → escalate care



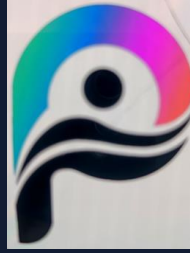
Unexplained weight loss / fever

Consider malignancy or infection, not just mechanical pain



Significant trauma history

Rule out fracture before mobilizing the spine



Summary Checklist

- ✓ Dermatome vs. myotome definitions
- ✓ Full dermatome map C2 – S5
- ✓ Full myotome map with key actions
- ✓ MRC 0–5 grading scale
- ✓ Deep tendon reflex – root correlations
- ✓ 4 clinical case studies with diagnosis & physio plan
- ✓ Red flags requiring urgent referral
- ✓ 8 MCQs with explained answers

Suitable for Physiotherapy, MBBS, BPT / MPT & OSCE practical examinations.