

# Clinical examination of the Spine

**Jwalant S. Mehta**

**MBBS, MS (Orth), D Orth, MCh (Orth), FRCS (Tr & Orth)**

**Consultant Spine Surgeon**

*The Royal Orthopaedic Hospital*

*Birmingham Childrens' Hospital*

*Spire Parkway Hospital*

*BMI The Priory and Edgbaston*

*Bromsgrove Private Clinic*

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# General aspects

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- ❖ Introduction
- ❖ Consent to examination
- ❖ Non-verbal communication (eye contact)
- ❖ ‘First impressions’
- ❖ Exposure; comfort (warm hands and room)
- ❖ Inflicting pain



# Standing un-supported

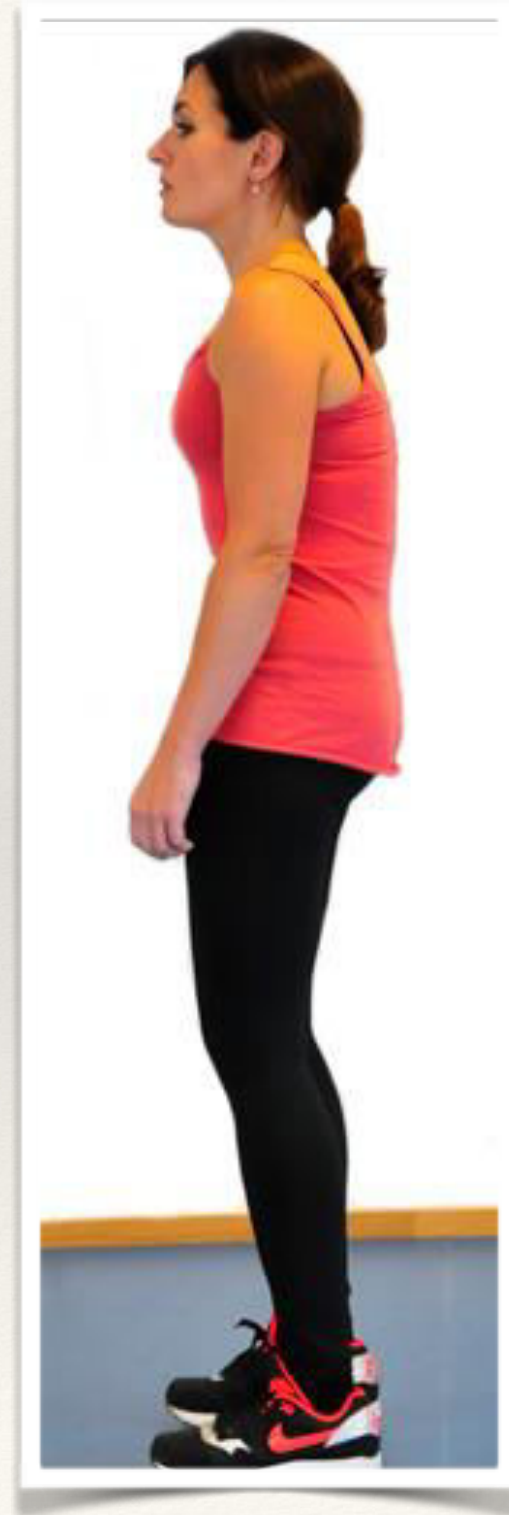
- ❖ Shoulders, Pelvis
- ❖ Muscle contours
- ❖ Spinal contours
- ❖ Limb lengths



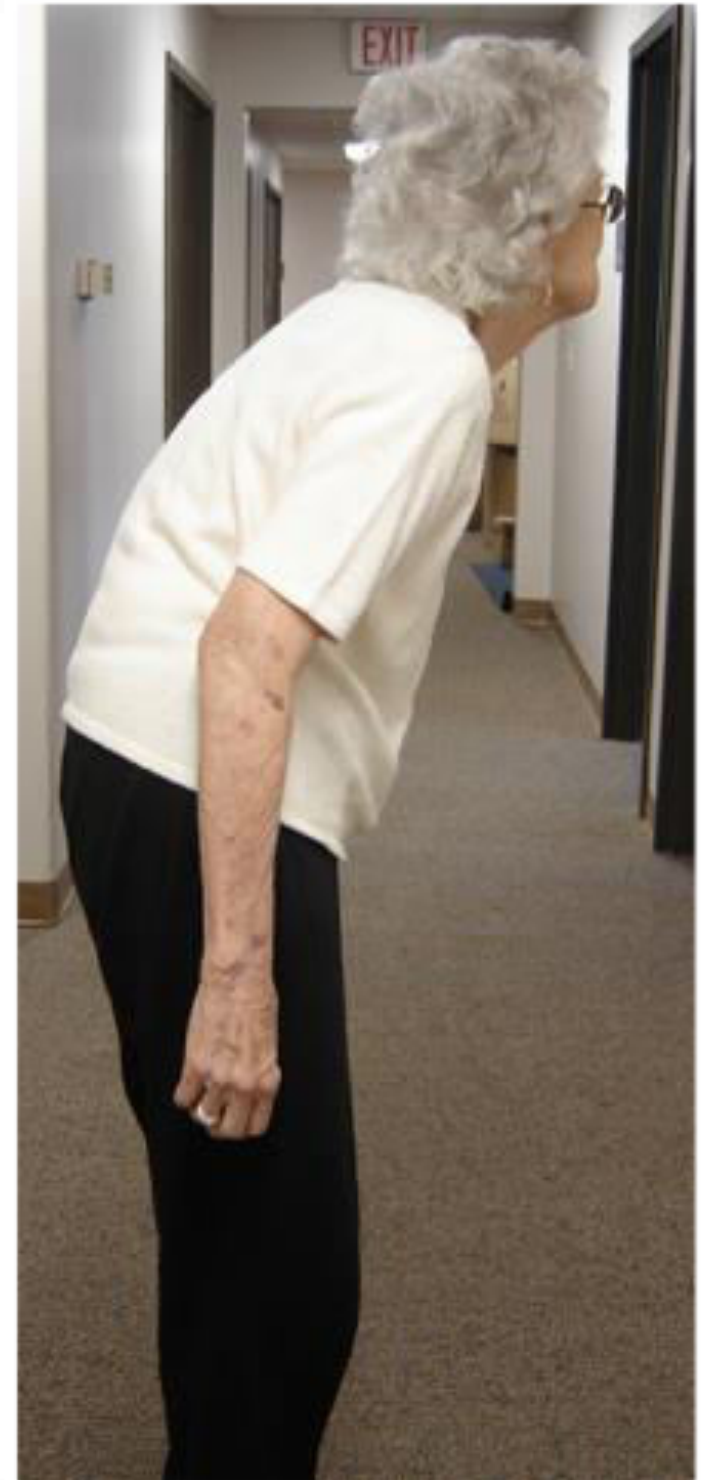


# Standing: side profile

- ❖ Forward stoop
- ❖ Hips and knees
- ❖ Forward gaze
- ❖ Spinal contours



# ‘Crouched’ stance





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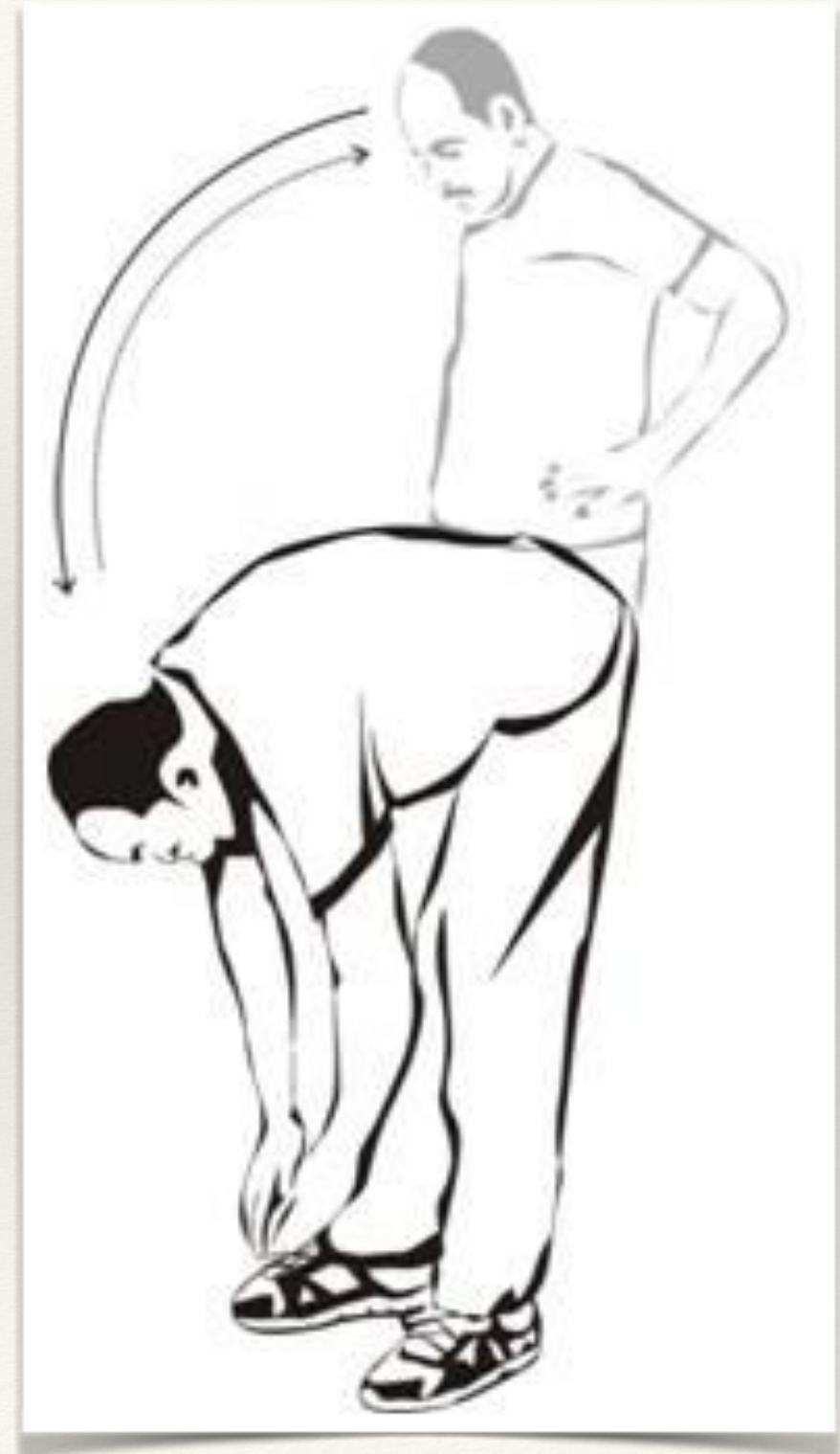
# Range of motion

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- ❖ Range
- ❖ Rhythm
- ❖ Extremes of range
- ❖ Pain

# Flexion of the trunk

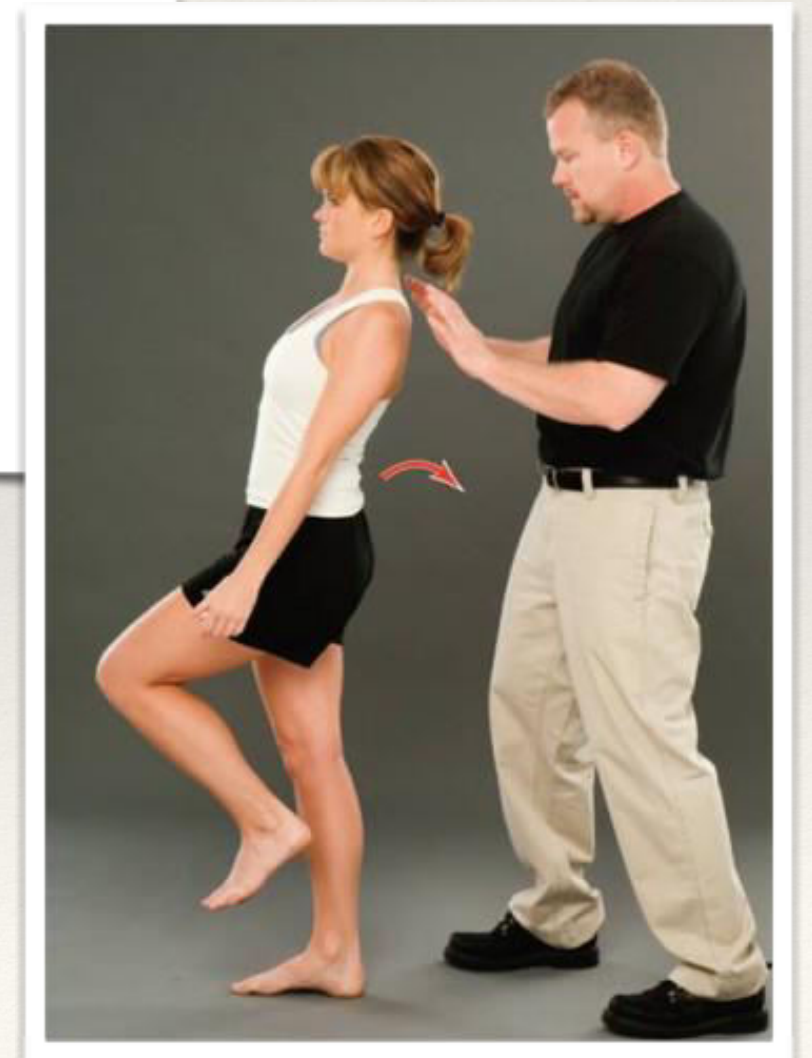
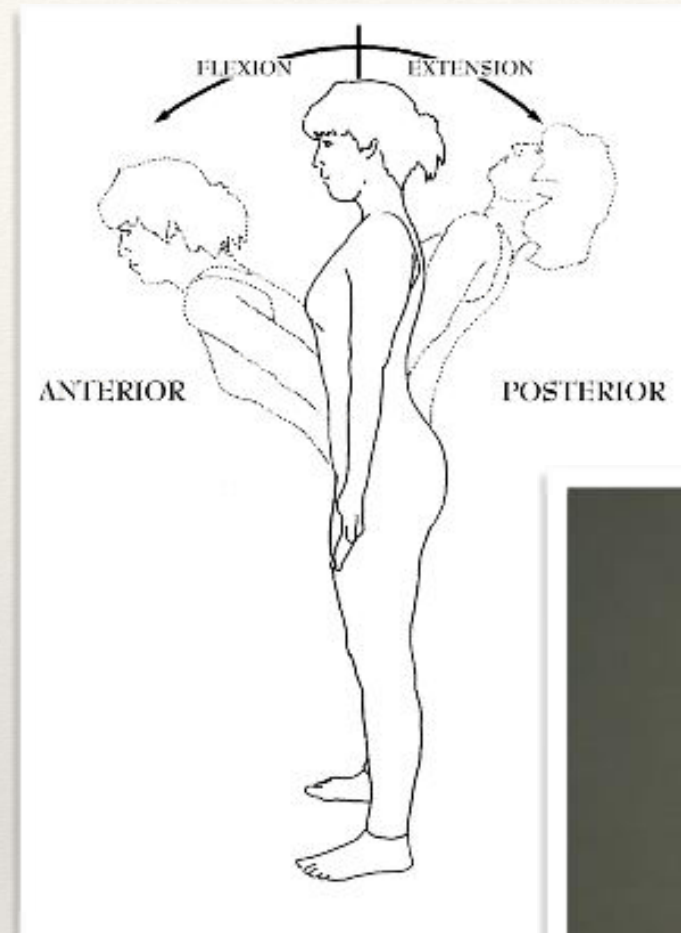
- ❖ General flexibility
- ❖ Getting up to neutral
- ❖ Discogenic: painful





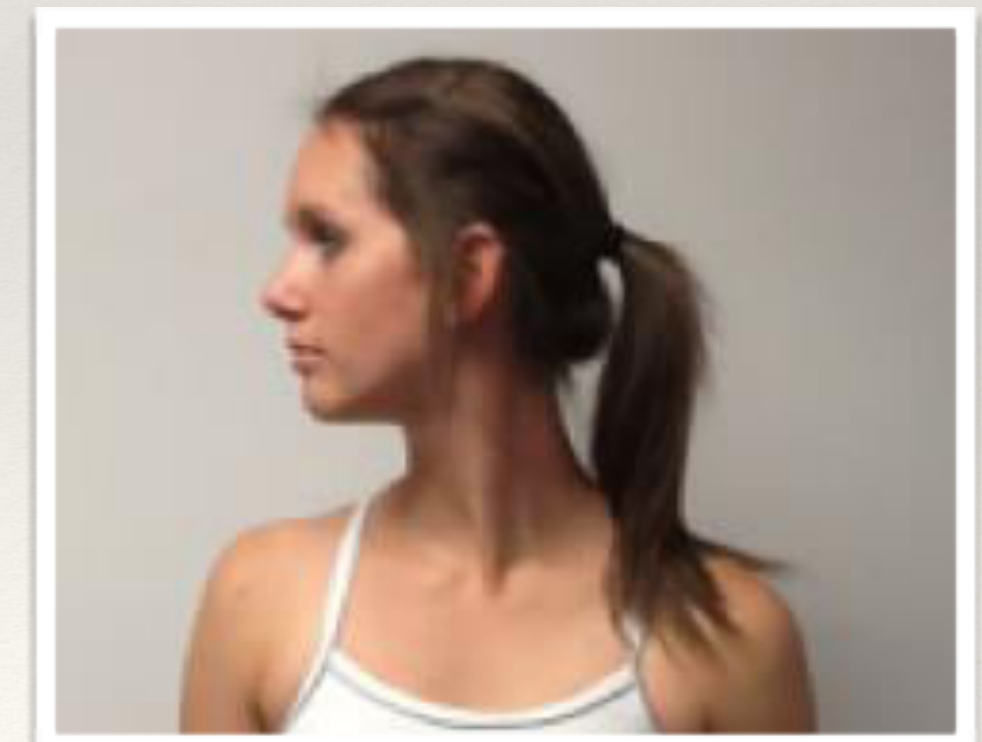
# Extension of the trunk

- ❖ Facet loading
- ❖ Disc prolapse / stenosis
- ❖ Spondylolysis
- ❖ 1 leg hyper-extension





# Cervical spine range examination



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# Pain

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- ❖ Symptom reported by the patient
- ❖ Tenderness
  - ❖ Midline
  - ❖ Gentle thump
  - ❖ Segmental rotation
  - ❖ Muscle spasm, tender points



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# Neurology

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- ❖ Motor (grades, through the full range of the joint)
- ❖ Sensations (all modalities)
- ❖ Reflexes (deep, superficial and pathologic)
- ❖ ASIA charts
- ❖ Document with date



## Neurologic Examination ☒ Check normal, circle & describe abnormal

CC & significant history: \_\_\_\_\_

Patient: \_\_\_\_\_ date: \_\_\_\_\_

Insurance: \_\_\_\_\_ (optional)

Date of birth: \_\_\_\_\_ MF

**Key considerations:** ☐ headache, ☐ head injury, ☐ dizziness/vertigo, ☐ seizures, ☐ tremors, ☐ weakness, ☐ incoordination, ☐ numbness/tingling,  
☐ difficulty swallowing, ☐ difficulty speaking, ☐ significant past history, ☐ environmental hazards, ☐ other: \_\_\_\_\_

☐ Refer for secondary consultation: \_\_\_\_\_

☐ Refer for diagnostic imaging: \_\_\_\_\_

### Mental Status: ☐ WNL

**Development** (☐ good, ☐ fair, ☐ poor)

**Behavior** (Alert, lethargic, confusion, speech)

**Orientation** (Time, person, place & situation)

**Memory/Concentration**

- ☐ Name president/recent newsworthy events
- ☐ 3 word or place recall at 0 and 5 minutes
- ☐ (100) - (7) up to five times (93, 86, 79...)
- ☐ Spell word backwards
- ☐ Draw a clock (make the time 12:30)
- ☐ Draw overlapping pentagons

### Reflexes: ☐ WNL

DTR (0-5)	R	L
Biceps (C5)		
Brachioradialis (C6)		
Triceps (C7)		
Patella (L4)		
Hamstring (L5)		
Achilles (S1)		

Pathologic	R	L
Babinski		
Abdominal		
Hoffman's		

\*Note presence of clonus

### Motor Function: ☐ WNL

Motor (0-5)	R	L
Deltoid (C5, C6) (axillary)		
Brachioradialis (C5, C6) (radial)		
Biceps (C5, C6) (musculocut.)		
Triceps (C6, C7, C8, T1) (radial)		
Wrist flexors (C6, C7) (med./ulnar)		
Wrist extensors (C6, C7, C8) (rad.)		
Interossei (C7, C8, T1) (ulnar)		
Tib. anterior (L4, L5) (deep per.)		
Extensor hallucis longus (L4, L5, S1) (deep peroneal)		
Fibularis (peroneus) longus (L5, S1) (superficial peroneal)		

### Cranial Nerves: ☐ WNL

I - Olfactory	R	L	VII - Facial	R	L
Scent #1			Facial expressions		
Scent #2			Facial expression #2		
			Normal eye moisture		
II - Optic			VIII - Vestibulocochlear		
Visual acuity			Rhombberg's test		
Visual fields			Auditory acuity		
Fundoscopic exam			Weber		
III, IV, VI - Oculomotor, trochlear, abducens			Rinne		
'H' pattern			IX, X - Glossopharyngeal & Vagus		
Convergence			Gag reflex		
Nystagmus			Elevation of palate		
Consensual light reflex			XI - Spinal accessory		
V - Trigeminal			Trapezius muscle test		
Lateral jaw deviation			SCM muscle test		
Masseter contraction			XII - Hypoglossal		
Face sensation			Stick out tongue		
Corneal touch reflex					

### Cerebellar: ☐ WNL

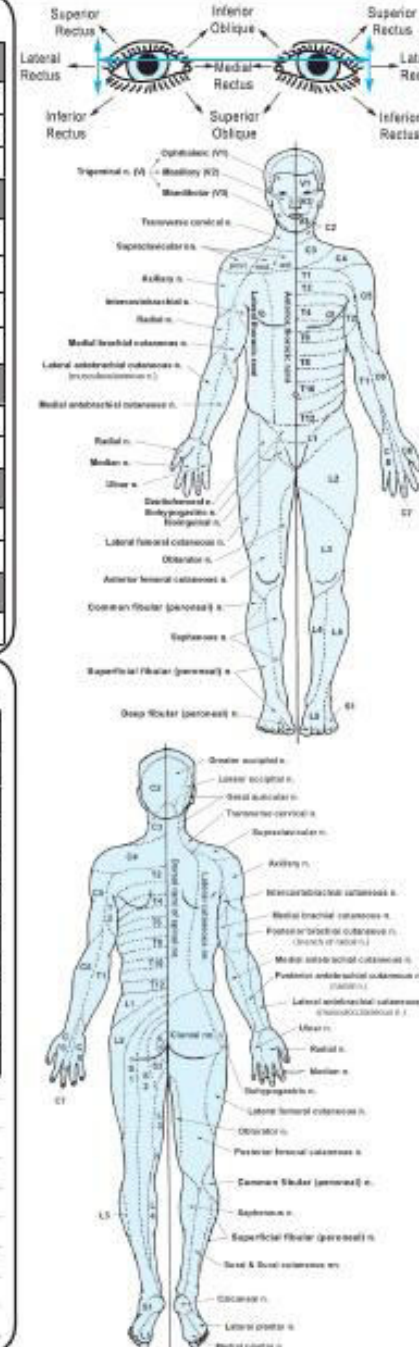
	R	L
Rapid finger movement		
Rapid pro/supination		
Finger-to-nose/finger		
Heel down shin		
Holme's rebound sign		
Gait/heel-toe walk		

### Sensory: ☐ WNL

	R	L
Light touch		
Vibration		
Stereognosis		
Graphesthesia		
2-point discrim		
Position sense		
Proprioception		
Romberg		
Sharp/dull		
Hot/cold		

### Nerve Tension: ☐ WNL

	R	L
Straight Leg Raise		
Maximal SLR		
Bragard's		
Femoral nerve traction		
Median nerve traction		
Radial nerve traction		
Ulnar nerve traction		
Tinel's		



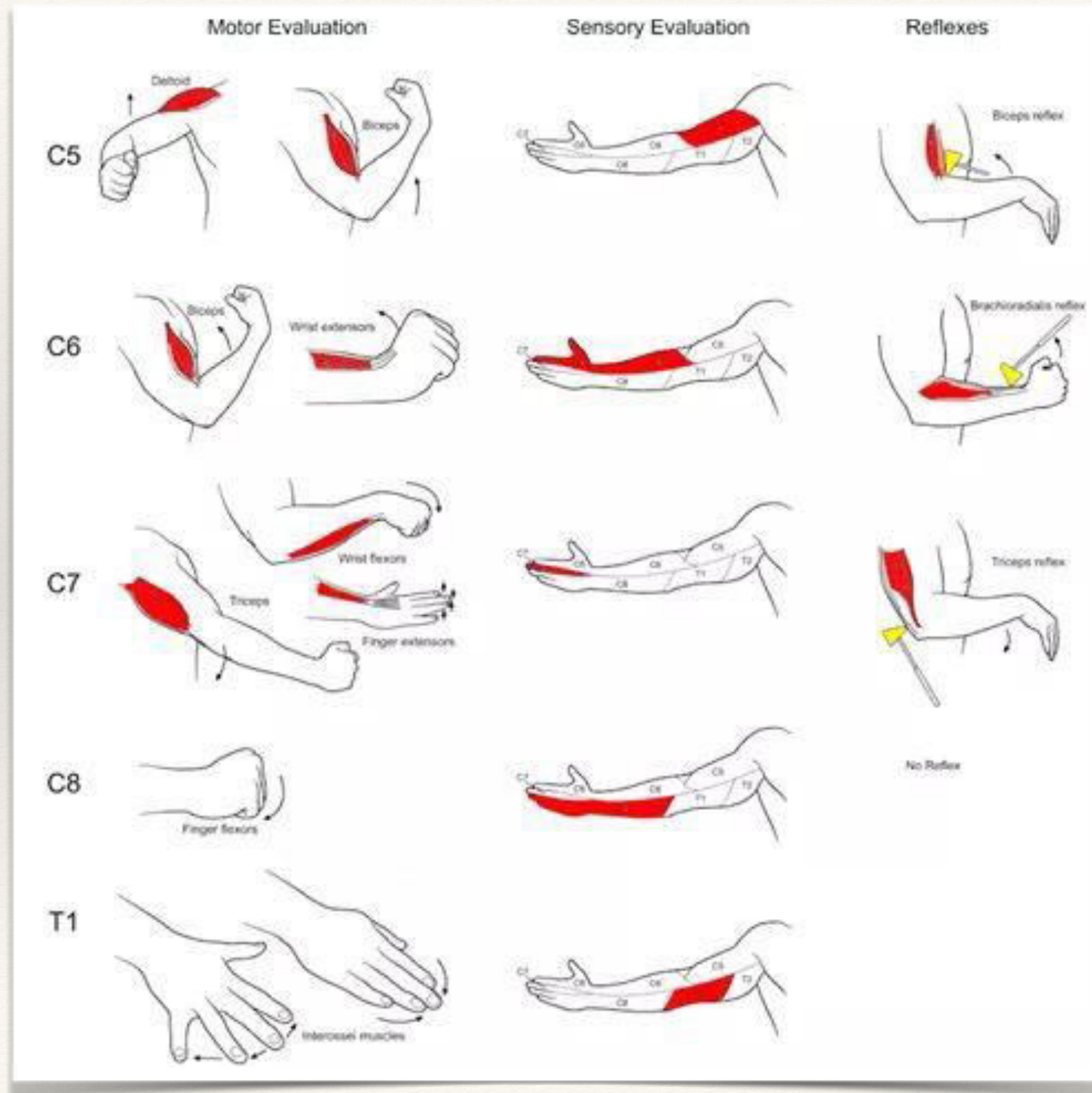
### DDx:

Signature: \_\_\_\_\_

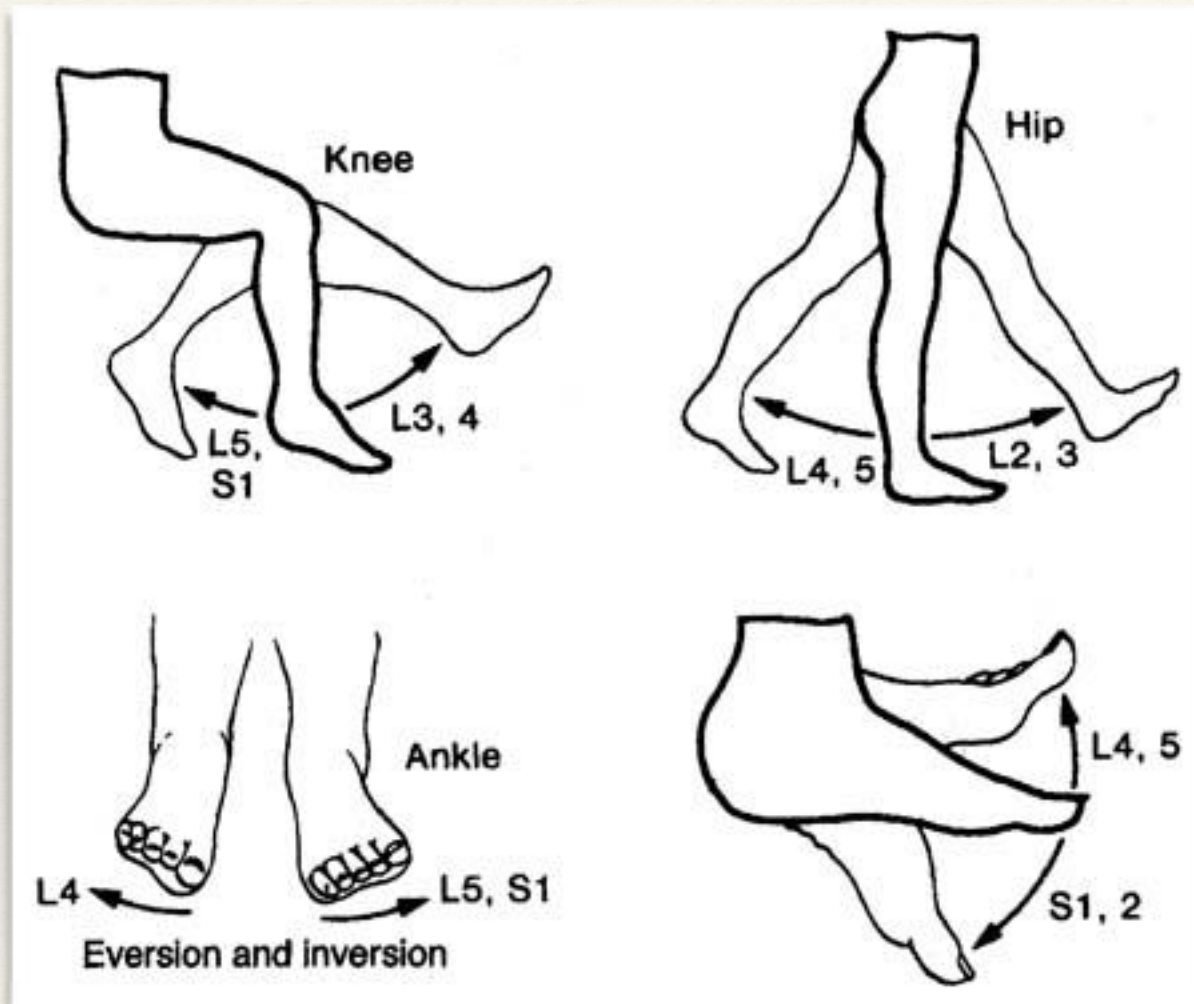
Date: \_\_\_\_\_



# Upper limb neurological exam



# Lower limb neurologic examination



**Figure 1. Testing for lumbar nerve root compromise.**

Nerve root	L4	L5	S1
Pain			
Numbness			
Motor weakness	Extension of quadriceps.	Dorsiflexion of great toe and foot.	Plantar flexion of great toe and foot.
Screening exam	Squat & rise.	Heel walking.	Walking on toes.
Reflexes	Knee jerk diminished.	None reliable.	Ankle jerk diminished.



# Deep tendon reflex

## ❖ Grading:

0	absent
1+	hypoactive
2+	normal
3+	hyperactive
4+	hyperactive with clonus
5+	sustained clonus

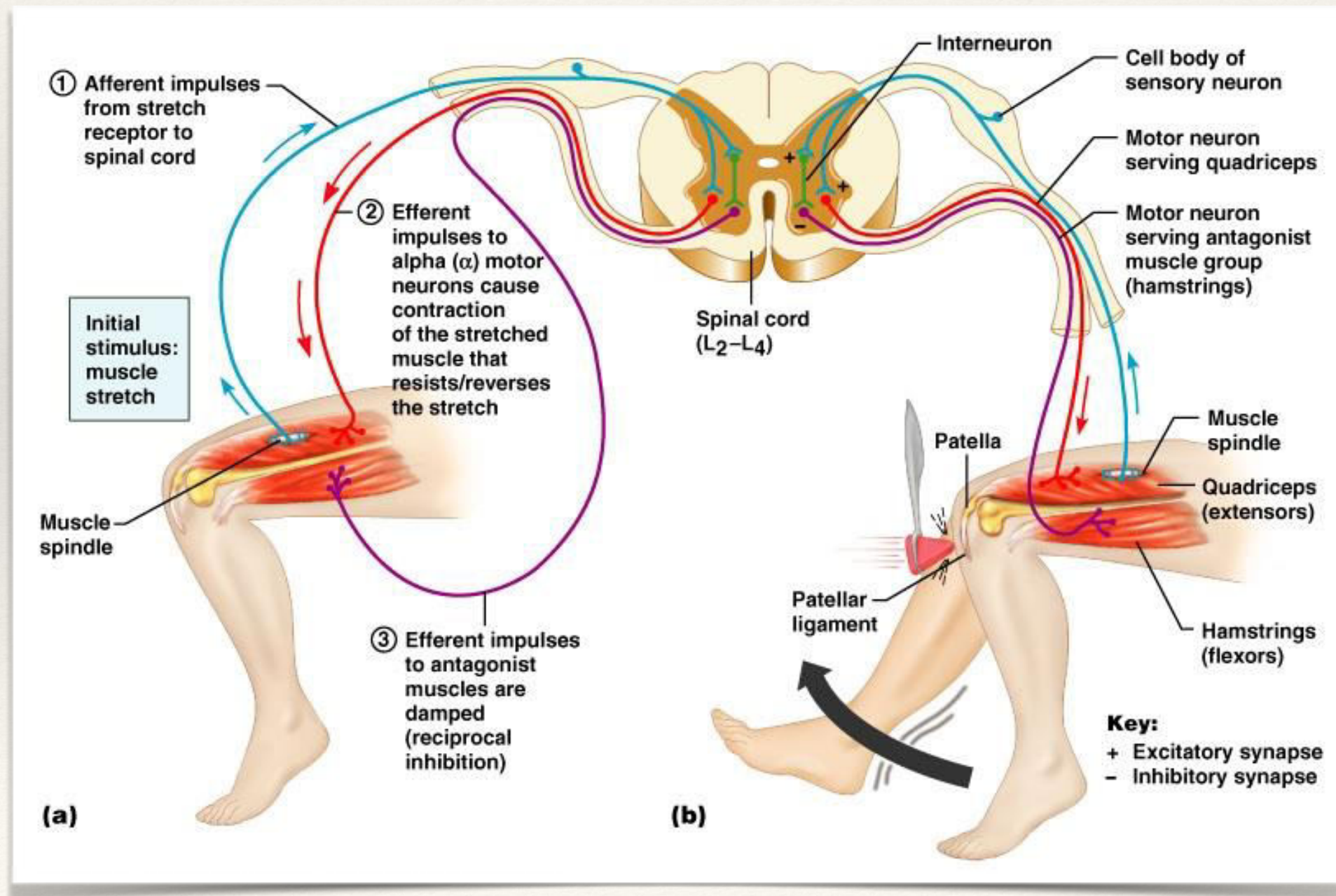
## ❖ Compare with opposite side





# Deep tendon reflex

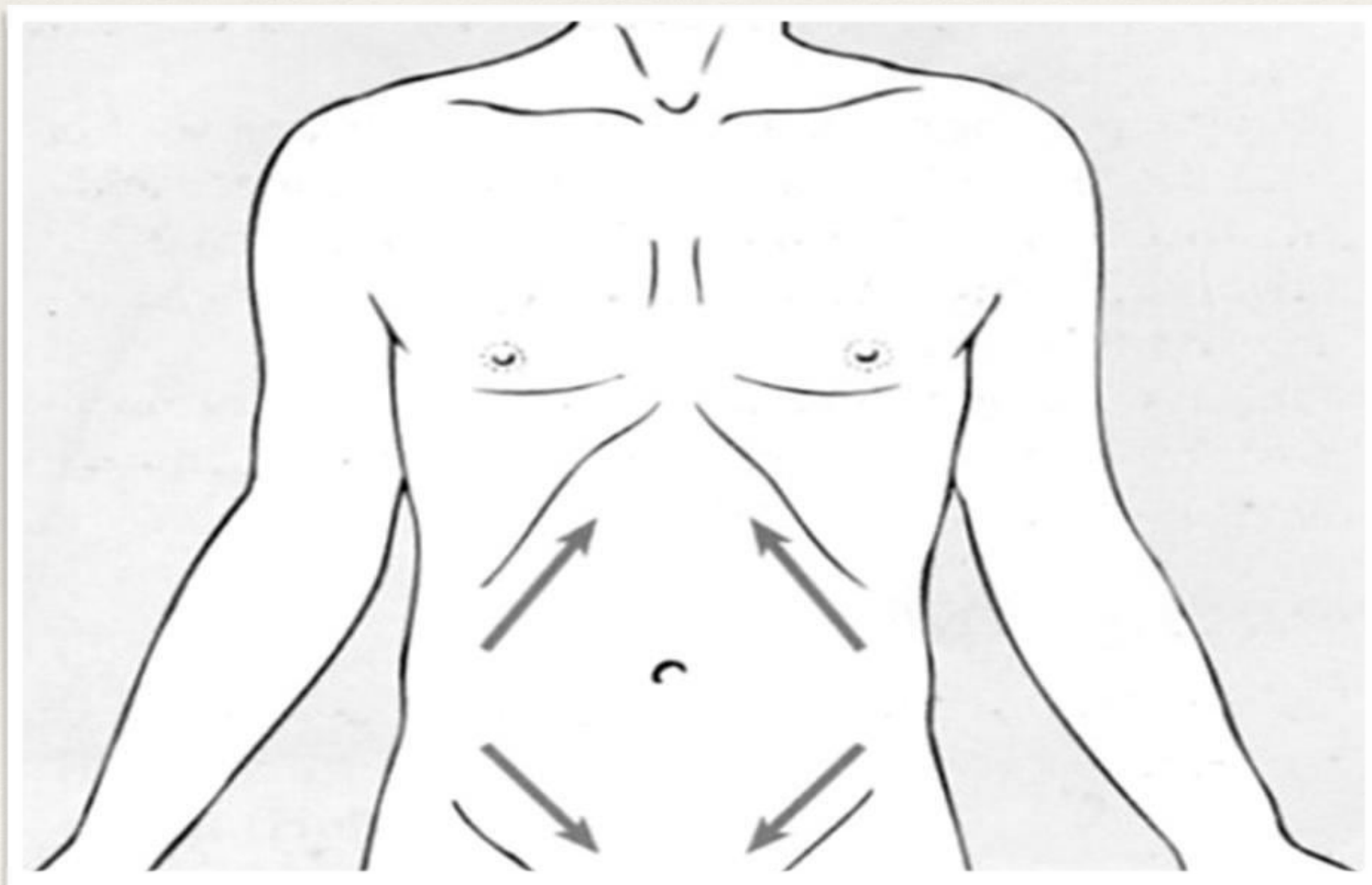
**Stretch reflex:** Contraction in response to stretch of muscle spindles (receptors in parallel to muscle fibres. 2 neuron arc.



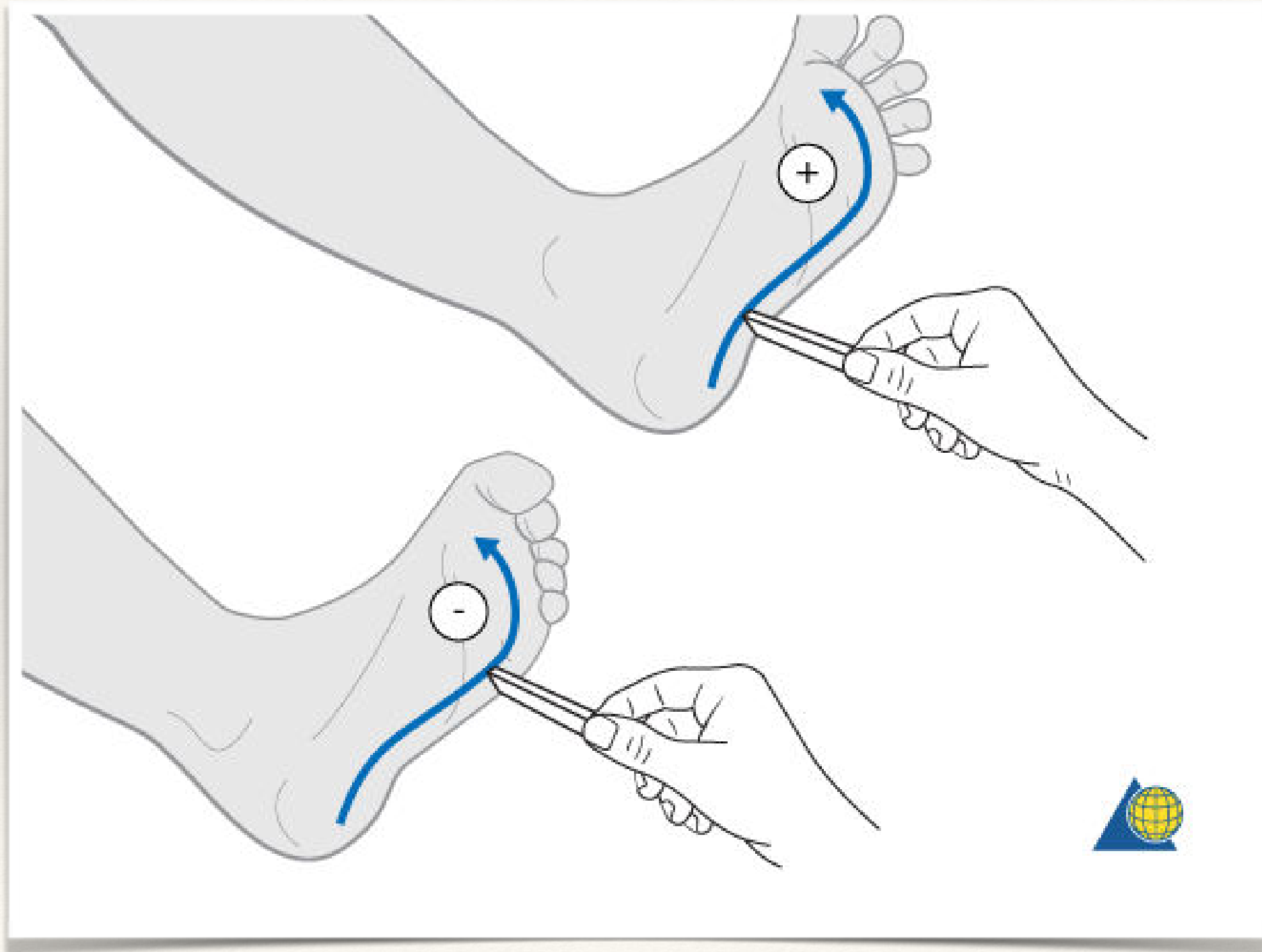


# Superficial abdominal reflex

Motor response to skin stimulation. Poly-synaptic response. Peripheral sensory nerve; ascending sensory tract; brain; descending motor tract and muscle. Present; absent or asymmetric.



# Babinski reflex

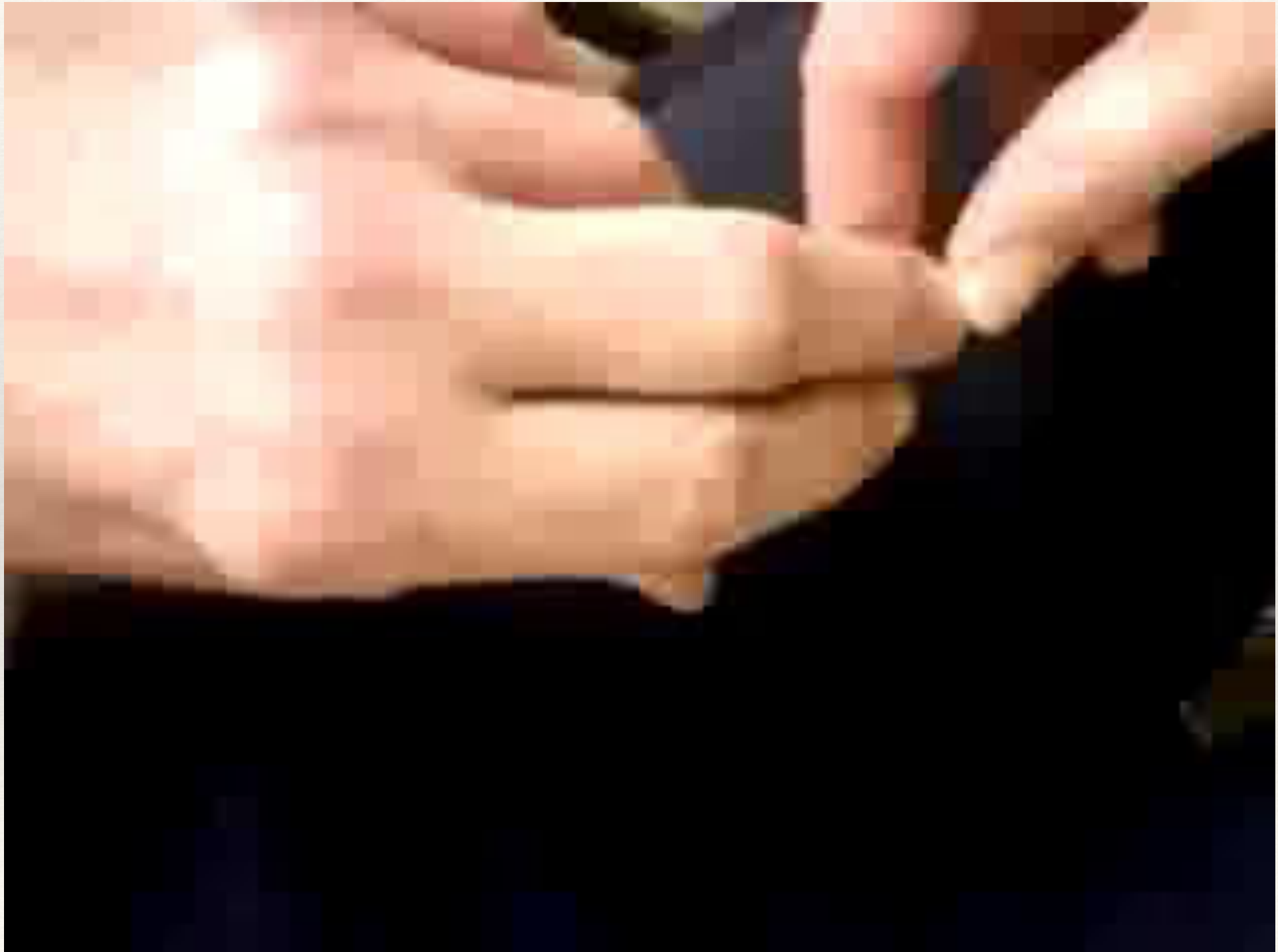




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# Hoffmans reflex

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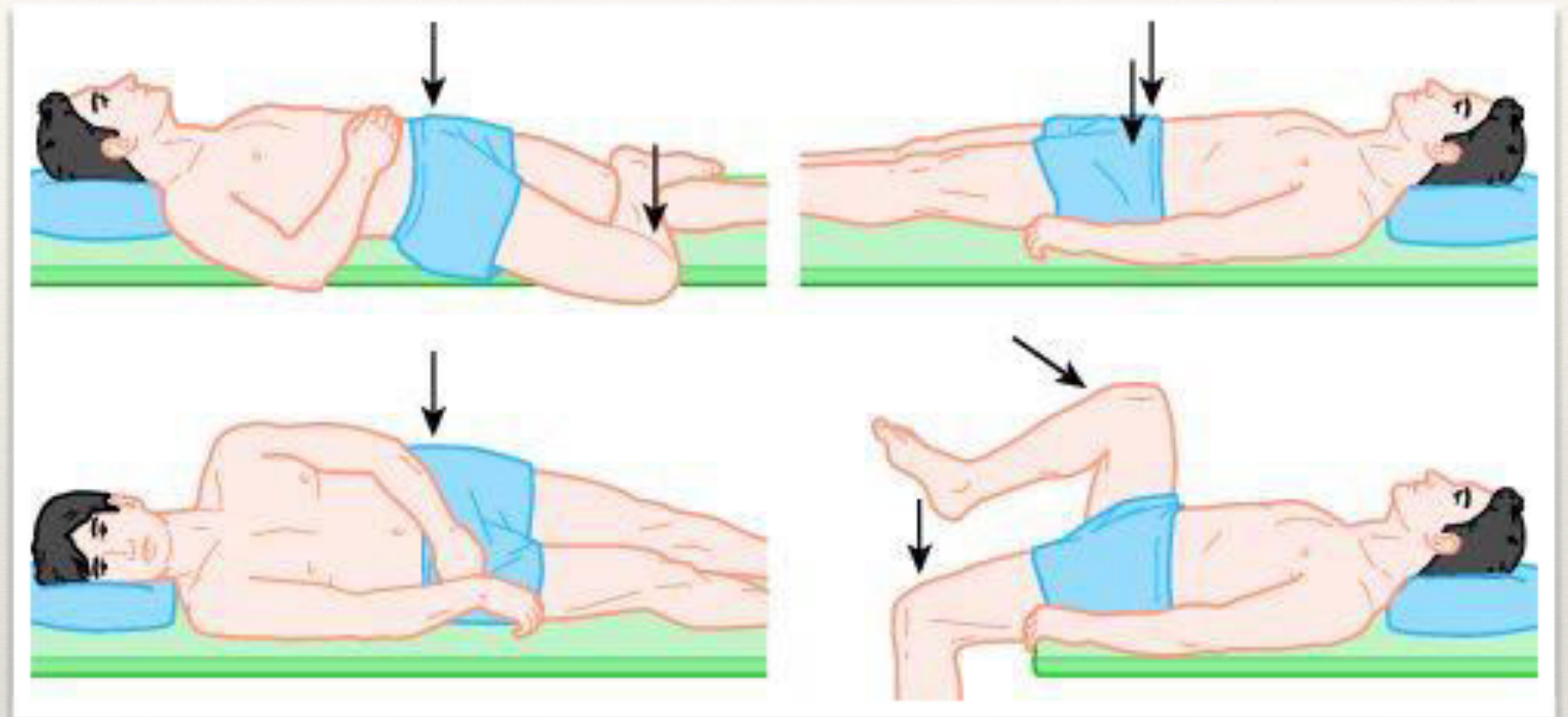
# Inverted radial reflex





# Sacro-iliac joints

- ❖ Stable joint
- ❖ Referred pain
- ❖ Tenderness
- ❖ Stressing joint
- ❖ Inflammation, injury





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# Waddell's 'non-organic' signs

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- ❖ Tenderness: superficial; non-anatomic
- ❖ Simulation of pain: axial load; rotation
- ❖ Distraction: straight leg raise
- ❖ Regional: motor; sensory
- ❖ Over-reaction

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# Ancillary examination

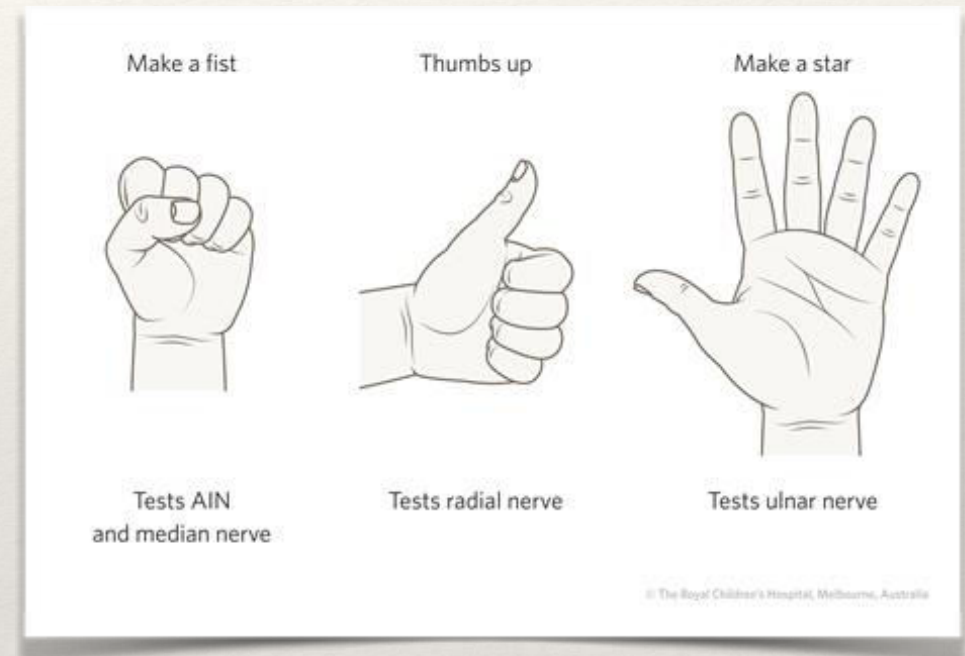
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- ❖ Shoulder examination
- ❖ Hip examination
- ❖ Peripheral nerves and Brachial plexus
- ❖ Distal pulses



# Peripheral nerves

- ❖ Tinel's sign over the course of the nerve
- ❖ Phalen's test for Carpal tunnel syndrome
- ❖ Neurological examination (sensations, motor)
- ❖ Median nerve; Ulnar nerve in upper limb



# Thoracic outlet

