

An Illustrated Guide For musculoskeletal System Examination

Bedside Teaching for 2nd year medical Students



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Before Examination :

Wash hands

Introduce yourself

Confirm patient details – *name / DOB*

Explain the examination

Gain consent

Ask patient if they have pain anywhere before you begin!



'GALS' Screening Examination

Gait

- Observe gait
- Observe patient in anatomical position

Arms

- Observe movement – hands behind head
- Observe backs of hands and wrists
- Observe palms
- Assess power grip and grip strength
- Assess fine precision pinch
- Squeeze MCPJs

Legs

- Assess full flexion and extension
- Assess internal rotation of hips
- Perform patellar tap
- Inspect feet
- Squeeze MTPJs

Spine

- Inspect spine
- Assess lateral flexion of neck
- Assess lumbar spine movement

Figure 6. With the patient in the anatomical position, observe from behind, from the side, and from the front, checking for:

Full elbow extension _____

Quadriceps bulk and symmetry _____

Forefoot abnormalities _____

Shoulder muscle bulk and symmetry _____

Spinal alignment _____

Gluteal muscle bulk and symmetry _____

Popliteal swelling or abnormalities _____

Calf muscle bulk and symmetry _____

Hindfoot abnormalities _____

Cervical lordosis _____

Thoracic kyphosis _____

Lumbar lordosis _____

Knee flexion/hyperextension _____



(a)		
	Appearance	Movement
Gait	✓	
Arms	✓	✓
Legs	✓	✓
Spine	✓	✓

(b)		
	Appearance	Movement
Gait	✓	
Arms	✗	✗
Legs	✗	✗
Spine	✓	✓

Swelling over dorsum of both wrists and knee effusions - early RA?

Figure Recording the findings from the GALS screening examination: (a) a normal result; (b) the results for a patient with wrist and knee swelling and associated loss of movement.

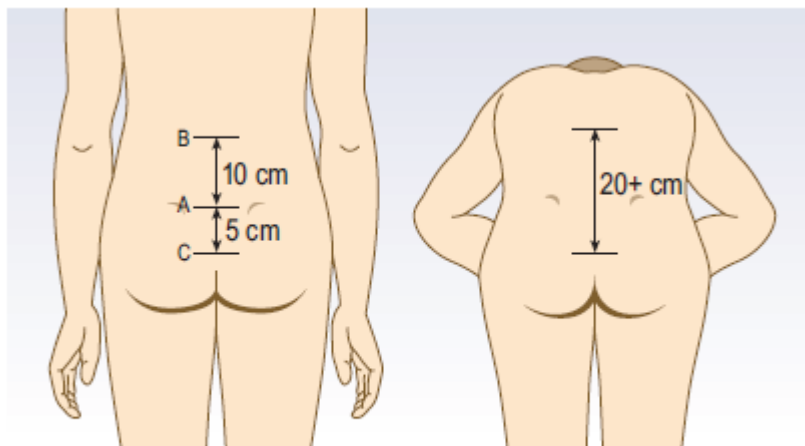


Fig. 14.24 Schober's test. Measuring forward flexion of the spine.



Figure Assessing lumbar spine flexion. Place two or three fingers on the lumbar vertebrae. Your fingers should move apart on flexion and back together on extension.

'REMS' General Principles

Introduction

- Introduce yourself
- Gain verbal consent to examine

Look for:

- Scars
- Swellings
- Rashes
- Muscle wasting

Feel for:

- Temperature

- Swellings

- Tenderness

Move

- Full range of movement – active and passive
- Restriction – mild, moderate or severe?

Function

- Functional assessment of joint

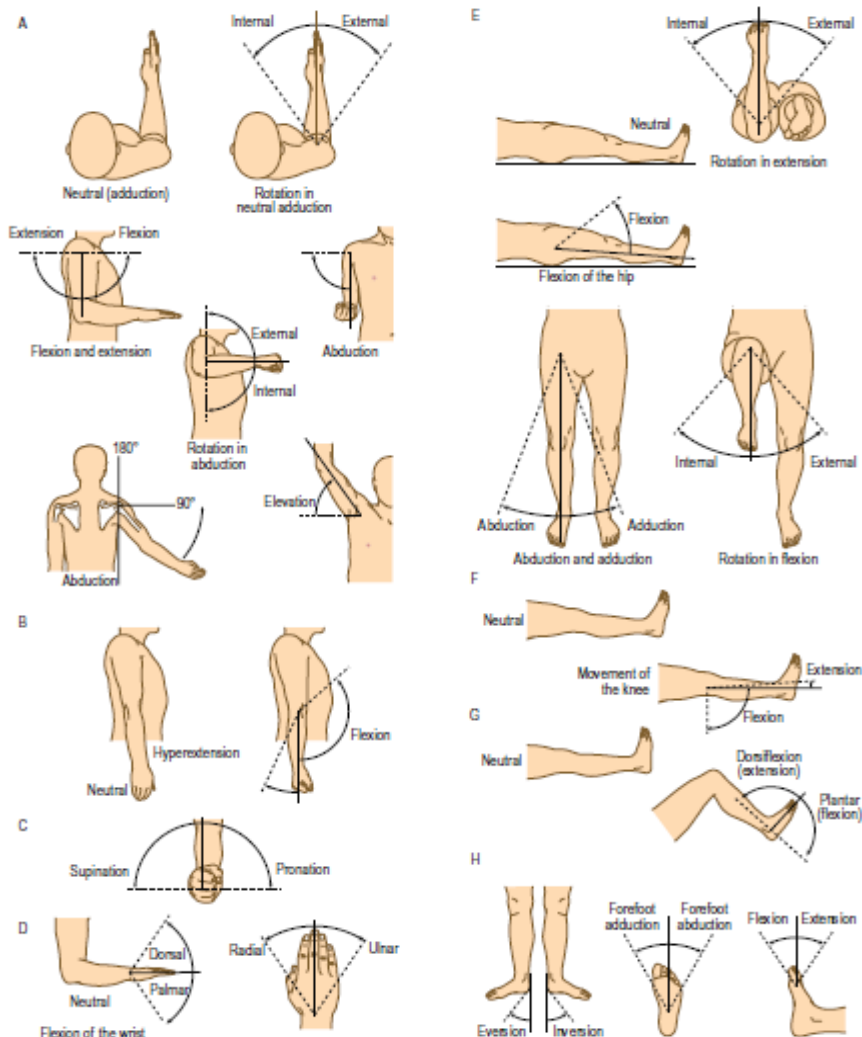


Fig. 14.7 Joint positions and movements of the upper and lower limbs.

Examination of the hand and wrist

- Introduce yourself/gain consent to examine
- Inspect hands (palms and backs) for muscle wasting, skin and nail changes
- Check wrist for carpal tunnel release
- Feel for radial pulse, tendon thickening and bulk of thenar and hypothenar eminences
- Assess median, ulnar and radial nerve sensation
- Assess skin temperature
- Squeeze MCPJs
- Bimanually palpate swollen or painful joints, including wrists
- Look and feel along ulnar border
- Assess full finger extension and full finger tuck
- Assess wrist flexion and extension – active and passive
- Assess median and ulnar nerve power
- Assess function: grip and pinch, picking up small object
- Perform Phalen's test (if suggestion of carpal tunnel syndrome)

a) Position the patient with hands are comfortable



b) Inspect the patient hands





c) Assess the temperature over the joint areas



d) Carpals Palpation



e) Feel the muscle bulk of the thenar eminence



f) Inspect the elbow



g) Assess the movements of wrist and fingers



Wrist flexion



Wrist extension



Finger extension



Finger flexion



Finger abduction



Thumb abduction



Thumb opposition

h)Phalens maneuver



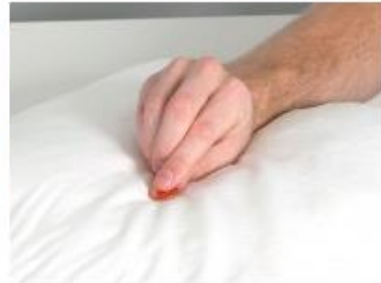
i) Functional Assessment



Power grip around middle and index fingers



Pincer grip against index finger



Pick up a small object

Examination of the elbow

- Introduce yourself/gain consent to examine
- Look for scars, swellings or rashes
- Assess skin temperature
- Palpate over head of radius, joint line, medial and lateral epicondyles
- Assess full flexion and extension, pronation and supination – actively and passively
- Assess function – e.g. hand to nose or mouth



Inspect the front



Inspect the side



Inspect behind and on the inside for scars



Assess the joint temperature



Palpate the medial epicondyle

Check joint movements



Flexion joint movement



Extension joint movement



Pronation joint movement



Supination joint movement



Check for tennis elbow



Check for golfers elbow

Check for Tennis elbow
and Golfers elbow

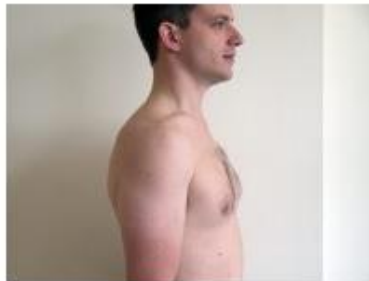
Examination of the shoulder

- Introduce yourself/gain consent to examine
- Inspect shoulders from in front, from the side and from behind
- Assess skin temperature
- Palpate bony landmarks and surrounding muscles
- Assess movement and function: hands behind head, hands behind back
- Assess (actively and passively) external rotation, flexion, extension and abduction
- Observe scapular movement

General Inspection of the shoulder joint



Inspection from the front



Inspection from the side



Inspection from the back



Leaning against the wall

Assess the temperature of the joint



Systematically feel along both sides of the bony shoulder girdle



Feel along the sternoclavicular joint



Feel the acromioclavicular joint



Feel around the spine of the scapula



The glenohumeral joint

Assess the active movements of the joint



Flexion movement



Extension movement



Abduction movement



Abduction movement 2



External rotation movement



Internal rotation movement

Special Tests



Impingement test



Apprehension test



Scarf test

Impingement test



Functional tests

Arms behind head



Arms behind back



Examination of the hip

- Introduce yourself/gain consent to examine

With the patient lying on couch:

- Look for flexion deformity and leg length disparity
- Check for scars
- Feel the greater trochanter for tenderness

- Assess full hip flexion, internal and external rotation

- Perform Thomas' test

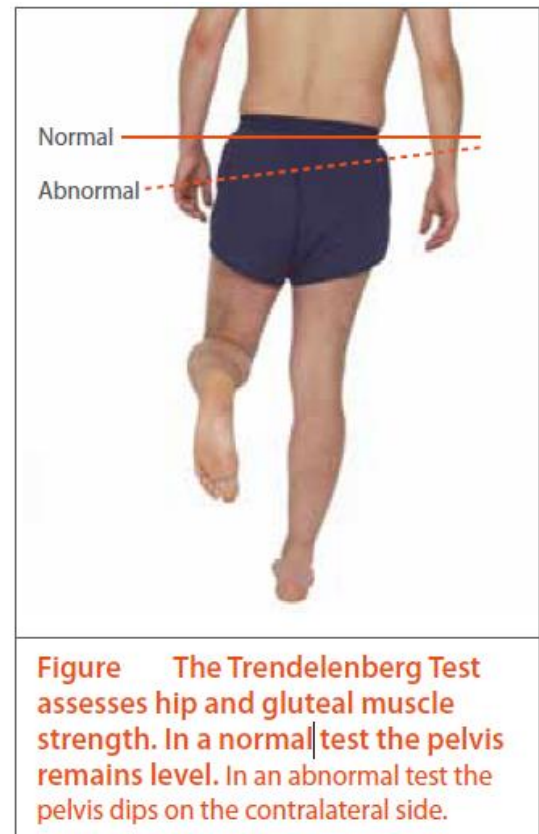
With the patient standing:

- Look for gluteal muscle bulk
- Perform the Trendelenberg test
- Assess the patient's gait

Ask patient to walk



Trendelenburg Test



Check apparent leg length and true leg length



True leg length measurement



Apparent leg length measurement

Palpate Greater Trochanter



Assess movement



Hip flexion



Hip extension



Hip internal rotation



Hip external rotation

Special Tests: Thomas test



Thomas' test



Place your hand under the patients lumbar spine



Figure Thomas' test for fixed flexion deformity of the hip. Keep one hand under the patient's back to ensure that there is no lumbar lordosis. Fully flex one hip. If the opposite leg lifts off the couch there is a fixed flexion deformity. (As the pelvis tilts a normal hip would extend allowing the leg to remain on the couch.)

Examination of the knee

- Introduce yourself/gain consent to examine

With the patient lying on couch:

- Look from the end of the couch for varus/valgus deformity, muscle wasting, scars and swellings
- Look from the side for fixed flexion deformity
- Assess skin temperature
- With the knee slightly flexed palpate the joint line and the borders of the patella

- Feel the popliteal fossa
- Perform a patellar tap and cross fluctuation (bulge sign)
- Assess full flexion and extension (actively and passively)
- Assess stability of knee ligaments – medial and lateral collateral – and perform anterior draw test

With the patient standing:

- Look again for varus/valgus deformity and popliteal swellings
- Assess the patient's gait

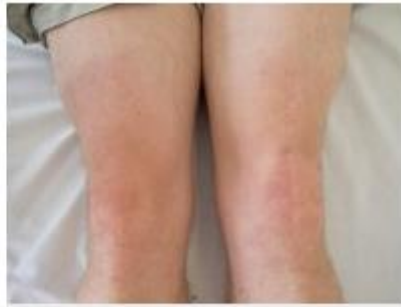
Ask patient to walk



General Inspection



Perform a general inspection



Note the scar over the left knee of this patient

Assess joint temperature



Patellar Examination



Palpate the border of the patella



Palpate the joint lines



Palpate the point of insertion



Tap the patella



Figure Patellar tap test. Slide your hand down the patient's thigh, compressing the suprapatellar pouch. This forces any effusion behind the patella. With two or three fingers of the other hand push the patella down gently. In a positive test the patella will bounce and tap.



Figure Cross fluctuation ('The Bulge Sign'). Stroke the medial side of the knee upwards towards the suprapatellar pouch. This empties the medial compartment of fluid. Then stroke the lateral side downwards (distally). The medial side may refill and produce a bulge of fluid, indicating the presence of an effusion.

Test movements



Knee flexion movement



Knee extension movement

Specific Tests

1-To test cruciate ligaments



Draw test



Posterior lag test



Figure Anterior Draw Test. Place both hands around the upper tibia, with your thumbs over the tibial tuberosity and your index fingers tucked under the hamstrings to make sure these are relaxed. Stabilize the lower tibia with your forearm and gently pull the upper tibia forward. There should normally be a small degree of movement; more substantial movement suggests laxity of the anterior cruciate ligaments.





2- To test collateral ligaments



Lateral stress



Medial stress



Figure Assessing medial and lateral collateral ligament stability. With the patient's leg on the couch or supported on your pelvis, place one hand on the opposite side of the joint line to that which you are testing and alternately stress the joint line on each side by applying gentle force on the tibia.

3- McMurray's Test (to assess meniscal damage)

(Please note that this test is no longer recommended in the NICE guidelines due to concerns that it may exacerbate the injury and due to its low diagnostic accuracy.)



Examination of the foot and ankle

- Introduce yourself/gain consent to examine

With the patient lying on couch:

- Look at dorsal and plantar surfaces of the foot
- Assess skin temperature
- Palpate for peripheral pulses
- Squeeze the MTPJs
- Palpate the midfoot, ankle joint line and subtalar joint
- Assess movement (actively and passively) at the subtalar joint

(inversion and eversion), the big toe (dorsi- and plantar flexion), the ankle joint (dorsi- and plantar flexion) and mid-tarsal joints (passive rotation)

- Look at the patient's footwear

With the patient standing:

- Look at the forefoot, midfoot (foot arch) and the hindfoot
- Assess the gait cycle (heel strike, stance, toe-off)

Observe the patient gait



Feel the Achilles tendon for any thickening or swelling



General Inspection



Check Ankle Temperature



Palpate the joint



Squeeze the metatarsophalangeal joints



Palpate the mid-foot



Palpate the ankle

Assess movements of the joint



Foot inversion movement



Foot eversion movement



Dorsiflexion movement



Plantarflexion movement



Toe dorsiflexion passively



Toe plantarflexion passively

Test midtarsal joint



Passive inversion



Passive eversion

Examination of the spine

- Introduce yourself/gain consent to examine

With the patient standing:

- Inspect from the side and from behind
- Palpate the spinal processes and paraspinal muscles
- Assess movement: lumbar flexion and extension and lateral flexion;

cervical flexion, extension, rotation and lateral flexion

With the patient sitting on couch:

- Assess thoracic rotation

With the patient lying on couch:

- Perform straight leg raising and dorsiflexion of the big toe
- Assess limb reflexes

Look at any spinal deformity



Examine patient from behind



Examine patient from the side

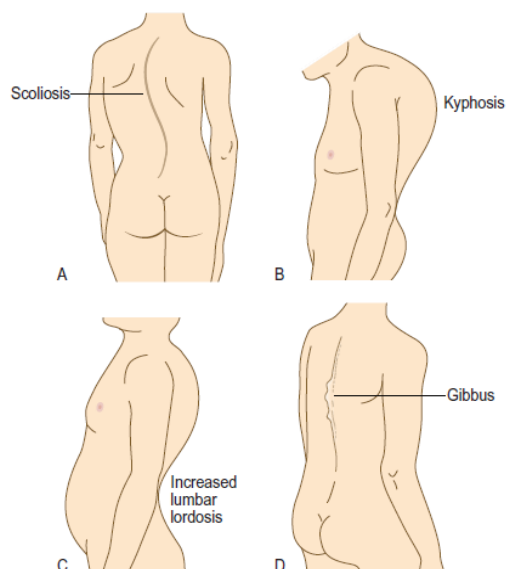


Fig. 14.19 Spinal deformities.



Feel areas around the spine

Assess Spinal movement



Lumber Lateral Flexion Movemet



Lumber Extension Test

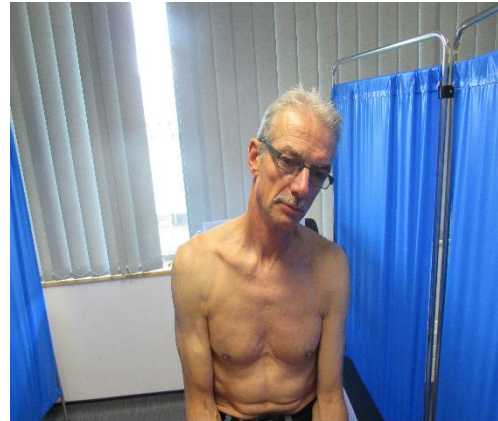


Lumbar flexion movement

Assess Cervical Spine movement



Cervical Extension Backward Movement



Cervical Flexion movement



Cervical rotation movement



Cervical flexion forward movement

Assess thoracic rotation

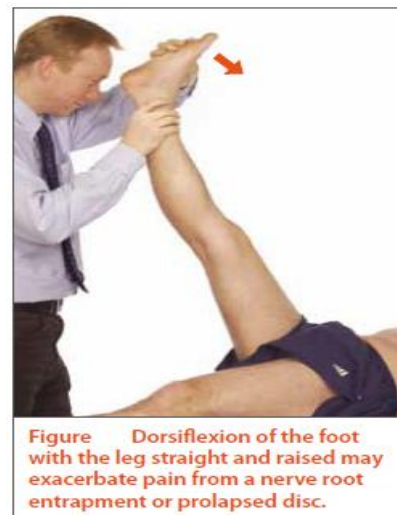
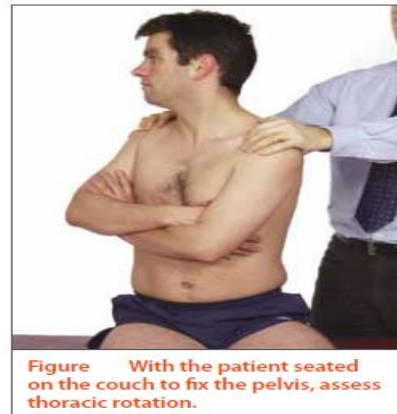


Thoracic Rotation Right



Thoracic Rotation Left

Straight leg raise test : for sciatica



References :

- 1- - Clinical assessment of the musculoskeletal system:Arthritis Reseach UK 2011.
- 2- Online osceskills website. www.osceskills.com
- 3- Macleod's clinical examination ,thirteenth ed. 2013