An Illustrated Guide For musculoskeletal System Examination

Bedside Teaching for 2nd year medical Students

Prepared by:

Dr. Farid Ghalli
Associate Clinical Teacher (Hon)

October 2016
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
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 Schöber’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

**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.
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

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
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 and Golfers elbow

Check for tennis elbow
Check for 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

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

Figure  The Trendelenberg Test assesses hip and gluteal muscle strength. In a normal test the pelvis remains level. In an abnormal test the pelvis dips on the contralateral side.
Check apparent leg length and true leg length

Palpate Greater Trochanter

Assess movement

<table>
<thead>
<tr>
<th>Hip flexion</th>
<th>Hip extension</th>
<th>Hip internal rotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip external rotation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Special Tests: Thomas test

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

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

Assess movements of the joint
Test midtarsal joint

Passive inversion

Passive eversion
Examination of the spine

- Introduce yourself/gain consent to examine
  - cervical flexion, extension, rotation and lateral flexion
  
  *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;
  - Assess limb reflexes

*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

Look at any spinal deformity
Assess Spinal movement

Feet areas around the spine

Lumbar Lateral Flexion Movement

Lumbar 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:
2- Online osceskills website, www.osceskills.com
3- Macleod’s clinical examination, thirteenth ed. 2013