Class 3 Notes for Orthopedic Assessment

Cervical spine

Flexion

1. Sternocleidomastoid (bilaterally)
2. Anterior scalene (bilaterally)
3. Longus capitis (bilaterally)
4. Longus colli (bilaterally)

Extension

1. Trapezius (upper fibers, bilaterally)
2. Levator scapula (bilaterally)
3. Splenius capitis (bilaterally)
4. Splenius cervicis (bilaterally)
5. Rectus capitis posterior major
6. Rectus capitis posterior minor
7. Oblique capitis superior
8. Semispinalis capitis
9. Longissimus capitis
10. Longissimus cervicis
11. Iliocostalis cervicis
12. Multifidi (bilaterally)
13. Rotatores (bilaterally)
14. Intertransversarii (bilaterally)
15. Interspinalis

Rotation - (unilaterally to the same side)

1. Levator scapula
2. Splenius capitis
3. Splenius cervicis
4. Rectus capitis posterior major
5. Oblique capitis inferior
6. Longus colli
7. Longus capitis
8. Longissimus capitis

9. Longissimus cervicis
10. Iliocostalis cervicis

Rotation - (unilaterally to the opposite side)

1. Trapezius (upper fibers)
2. Sternocleidomastoid
3. Anterior scalene
4. Middle scalene
5. Posterior scalene
6. Multifidi
7. Rotatores

Lateral Flexion - (unilaterally to the same side)

1. Trapezius (upper fibers)
2. Levator scapula
3. Sternocleidomastoid
4. Anterior scalene (with ribs fixed)
5. Middle scalene (with ribs fixed)
6. Posterior scalene (with ribs fixed)
7. Splenius capitis
8. Splenius cervicis
9. Longus capitis
10. Longus colli
11. Longissimus capitis
12. Longissimus cervicis
13. Iliocostalis cervicis
14. Oblique capitis superior
15. Intertransversarii

AROM – Magee (AMA Guide to permanent evaluation of impairment)

1. Flexion – 80 degrees or greater, (50 degrees or greater)
2. Extension – 70 degrees or greater, (60 degrees or greater)
3. Lateral (Side) flexion – 20 to 45 degrees (45 degrees)
4. Rotation – 70 or greater (80 degrees)

PROM - Passive movements – if patient did not have full range and to determine the end feel (for all normal is tissue stretch)

1. Flexion
2. Extension
3. Lateral flexion
4. Rotation

RIM – Resisted Isometric Movements

1. Flexion
2. Extension
3. Lateral Flexion
4. Rotation

Myotomes

1. Neck flexion (C1-C2)
2. Neck side flexion (C3)
3. Shoulder elevation (C4)
4. Shoulder joint abduction (C5)
5. Elbow flexion/wrist extension (C6)
6. Elbow extension/wrist flexion (C7)
7. Thumb extension/ulnar deviation (C8)
8. Abduction/adduction of hand intrinsic muscles (T1)

Functional assessment – activities of daily living

1. Breathing with mouth closed
2. Swallowing
3. Looking up at the ceiling
4. Looking down at shoelaces
5. Shoulder check (60-70 cervical rotation needed)
6. Tuck chin in and out

Special tests at cervical spine

1. Foraminal compression (Spurling's) test – Patient side flexes the head and examiner gently pushes straight down on patient's head. Test is positive if pain radiates down the arm towards which the head is flexed. Indicates cervical radiculitis (pressure on nerve root). Pain is in dermatome distribution of nerve root.
2. Distraction test – examiner places one hand under chin and other under occiput and slowly lifts the patient's head. Positive test is if pain is decreased or relieved. Indicates pressure or nerve roots that has been relieved.
3. Upper limb tension test (brachial plexus tension test or Elvey test) - ULTT is equivalent to a SLR in lumbar spine. The main reason for using a ULTT is to check cervical radiculopathy.
    a. ULTT 1 – shoulder depression and abduction to 110 degrees, elbow extension, forearm supination, wrist extension, finger extension, cervical spine contralateral side flexion – median nerve
    b. ULTT2 – shoulder depression and abduction to 10 degrees, elbow extension, forearm supination, wrist and finger extension, shoulder lateral rotation, c-spine contralateral side flexion – median nerve, musculocutaneous nerve, axillary nerve
    c. ULTT3 – shoulder depression and abduction to 10 degrees, elbow extension, forearm pronation, wrist flexion and ulnar deviation, finger flexion, shoulder medial rotation, c-spine contralateral side flexion – radial nerve
    d. ULTT4 - hand to ear. Depression, abduction, elbow flexion, supination, wrist extension and radial deviation, shoulder lateral rotation, c-spine contralateral side flexion – ulnar (C8, T1nerve roots)
4. Brachial plexus tension test – abduct and laterally rotate until symptoms appear, then lower arms till symptoms disappear. Examiner holds arms. Patient places hands behind head. + if symptoms return.

5. Bikele's sign - patient sitting, with arm abducted to 90 degrees with elbow flexed, then both extended. Modified ULTT done actively. The test is positive if radicular pain or other neurologic symptoms are felt on extending the shoulder joint and elbow joint. A positive Bikele's sign indicates a nerve root tension, brachial plexus neuritis and/or meningitis.
6. Shoulder depression test - side flex head to the opposite side and depressed shoulder, if the pain is increased indicated nerve root irritation, compression, foraminal encroachment, adhesions around dural sleeves.
7. Shoulder abduction (relief) test - place hand on the head – relieves symptoms C4. C-5, C-6
1. Romberg test – patient stands with feet together arms to the side and eyes open. Observe for balance problems. Patient closes eye for 20-30 seconds. Positive test is if patient sways or falls when eyes are closed. Upper motor neuron lesion.
8. Lhermitte's test – patient sits on examination table legs straight. Examiner passively flexes head and thigh. Positive tests – sharp pain down the spine and into the upper and/or lower limbs – dural, meningeal irritation, cervical myelopathy.
9. Jacksons compression test – patient rotates head to one side and examiner presses down on head. Positive test – pain radiates into the arm. Compression of nerve root. (Modification of foraminal compression test)
10. Valsalva maneuver – patient takes deep breath and holds while bearing down as if moving the bowels. Increases intrathecal pressure – positive if pain increases. Possible cause herniated disc, tumor, osteophytes. Patient can become dizzy and pass out.
11. Tinel's signs for brachial plexus lesions – examiner taps the area of brachial plexus. Patient neck slightly side flexed to opposite side
12. Brachial plexus compression test – examiner squeezes brachial plexus. Positive test – pain radiates into the shoulder, upper extremity.
13. Vertebral artery (Cerebral quadrant) test – patient supine, examiner passively moves patient head into extension and lateral flexion and followed by rotation to the same side. Position is held for 30 seconds. Positive test provokes symptoms. Dizziness, nystagmus, headache.
14. Static vertebral artery test – can be done sitting or supine. Each position is sustained for 30 sec. Symptoms reproduced – nystagmus, dizziness,

lightheadedness, visual disturbances. If first position is positive do not proceed to next.
   a. Sustained full neck and head extension
   b. Sustained full head and neck rotation
   c. Sustained full head and neck extension and rotation
15. Hautant's test – – helps to differentiate dizziness caused by articular vs vascular problems. Patient sits arms flexed to 90, eyes closed. If arms move dizziness and vertigo nonvascular. If no movement, patient rotates and extends the head, closes eyes. Arm moves - vascular problem to the brain.
16. Underburg's test – Patient holds arms at 90 degrees of flexion, elbows straight, forearms supinated, patient closes eyes and marches in place while head is held in extension and rotation to one side. Test is positive if there is dropping of arm, loss of balance or pronation of hands – decreased blood supply to the brain
17. Naffziger's test – compress jugular veins standing from behind, hold for 30 seconds and then ask patient to cough – pain indicate nerve root problem or space occupying lesion
18. Barre's test – patient stands with arms flexed forward to 90 degrees, elbows straight and forearms supinated, eyes closed. Hold for 20 seconds. Positive – arms fall with pronation.
19. Temperature (caloric) test – hot/cold over mastoid. Positive test – vertigo – inner ear problem.
20. Dizziness test – examiner rotates patients head as far as possible and holds for 10 seconds, then rotates shoulders head still. Dizziness in both cases, vertebral artery problem and if only when head rotates, inner ear problem
21. Sharp-pusher test – determines subluxation of the atlas on the axis. Examiners one hand is on patient's forehead other hands thumb stabilizes spinous process of C2. RIM of forward flexion. Positive test head slides backward. Test done with extreme caution.
22. Transverse ligament share test – tests for hypermobility in atlantoaxial joint
23. Lateral share test – test for instability in atlantoaxial joint due to odontoid dysplasia

Reflexes checked in cervical spine assessment

1. Biceps – C5 C6

2. Triceps = C6, C7
3. Hoffmann's sign - A positive Hoffmann's sign is suggestive of corticospinal tract dysfunction localized to the cervical segments of the spinal cord , in this regard, it is analogous to the Babinski sign. Conditions such as multiple sclerosis, hyperthyroidism, and anxiety will also result in a positive sign. Systemic disorders usually result in a bilateral response while structural anomalies such as tumors result in a unilateral response.
    a. Examiner loosely holds the middle finger and flicks the fingernail downward, allowing the middle finger to flick upward reflexively.
    b. Positive test - characterized by flexion and adduction of the thumb and flexion of the index finger.