

PHTY 301 Lecture Notes Wk 1

The primary components of the physical examination include

- **Observation**
- **Functional tests**
- **AROM +/-over pressure**
- **Repeated, sustained, combined movements**
- **Screening tests** (e.g. hip, SIJ)
- **Neurological exam** (PNS/CNS)
- **Nuerodynamic tests** (lower quarter)
- **Physiological motion palpation** (PPIVMS)
- **Palpation**
- **Accessory motion palpation** (PAIVMS)
- **Motor control examination** -specific postural & movement control test; specific muscle tests (as indicated)
- **Muscle length tests** (as indicated)
- Not all of these are assessed in all patients- must be performed in a logical sequence of standing, sitting, supine, side lying and prone
- Alter the level of assessment depending on the presentation
 - In situation of acute LBP, observe for acute or protective postures
 - Ie lumbar list
 - When patient can adopt normal postural attitude, undertake a full postural analysis

Lumbar List

- **Acute deformity:**
- Abdominal muscle spasm
- Flat lumbar spine (no lordosis) or lumbar “kyphosis”
- **Postural abnormalities:**
- Note that deviations may be normal variations
- Abnormalities may reflect
 - Structural changes
 - Articular system deviations
 - Muscle system deviations
 - Neural system deviations
 - Reaction to pain states
 - Psychological factors ie depression
- **Global posture classifications:**

- Normal
- Kyphosis / lordosis
- Sway back
- Flat back
- Military
- **Principles of postural assessment:**
- Perform an analysis of **structural shape**
 - Real or apparent leg length difference
 - Scoliosis
 - Kyphosis
- Perform an analysis of **muscle form**
 - Hypertrophy
 - Spasm
 - Inhibition
 - Muscle wasting
- Observe for evidence of protection of neural structures
- Dynamic analysis of postural correction to upright neural posture – sitting, standing
- Analysis of postural control under low load if necessary
- **Active movement testing (AROM)**
 - Establish baseline pain or other symptoms
 - Explain test procedure pre AROM testing/ removal of clothing
 - Observe quantity and quality of movement
 - Observe pattern of movement restriction / pain reproduction
 - Overpressure (if full ROM and painfree)
 - Test:
 - Lumbar flexion
 - Lumbar extension (standing or lying)
 - Lateral flexion (L and R)
 - Lumbar spine rotation
 - Combined movements
- **Screening tests:**
 - If peripheral joint or other structures are potential source of pain consider location and nature of pain
 - Lumbar region tests
 - Hip: squat, flex / adduction (quadrant test)
 - SIJ: compression and distraction
- **Neurological Examination:**

- This is the test of the peripheral nervous system and central system
- Both are tests of axonal conduction
- PNS:
 - Possible to have radiculopathy without obvious PE examination findings due to overlap with dermatomes and myotomes
 - I.e. clinical exam may not pick up all cases of axonal conduction loss
- CNS:
 - Test for spinal cord compression
 - Results in sensory & motor disturbances
 - Hyper-tonia/spasticity especially in LL's
 - Bilateral numbness, P&N's, paresthesia or weakness; loss of balance, gait disturbances, loss of co-ordination
 - P/E includes Babinski, Clonus, coordination tests, Assessment of gait
 - Requires medical opinion; contraindication to PT Rx
- **Neurodynamic Tests:**
 - SLR (lumbosacral nerve roots (sciatic nerve) –L4, 5, S1
 - Slump test -test of neural tissue extensibility
 - Femoral nerve L2-4
 - Passive neck flexion (PNF)
- **Palpation:**
 - Palpate soft tissue in all areas of pain
 - Texture, temperature, tone
 - Skeletal landmarks areas of local and referred pain
 - Aim to identify relevant tissue tenderness – compare to unaffected side
 - Essential preliminary to accessory motion palpation
- **PAIVM:**
 - Passive accessory intervertebral movements
 - Initially must be testing in neutral
 - Patient must be relaxed – pillow under abdomen to position Lx in neutral and help relax muscles
 - Combined positions / out of neutral
 - Movement in target segment and whole lumbar spine
 - **Accessory motion palpation:**
 - Downward – PA central pressure
 - Left down – PA unilateral pressure
 - Across – transverse pressure
 - Pain provocative test:
 - Tests of resistance to movement / stiffness / tissue compliance

- Systematic graded oscillatory pressure applied via skeletal landmarks (centrally and unilaterally)
 - Mild, moderate and firm – work through soft tissue
 - Compare with adjacent segments for reference – above, below, left and right
 - Remember to always test unaffected side first
 - Results:
 - Resistance to movement – stiffness or tissue compliance
 - Pain provocation / symptom response – local versus referred pain
 - Relationship between pain and the resistance
 - Limiting factor P2 versus R2 – if P2 wouldn't be able to gauge stiffness
 - End feel
 - Interpretation:
 - Segment may feel “stiff” due to changes in muscle tone 2° to underlying tissue sensitivity & **not** actually lack movement
 - Need to correlate with AROM & passive physiological motion palpation findings for interpretation
 - E.g. painful segment which lacks “control” may feel stiff to accessory motion palpation & be painful yet have full AROM & good passive physiological intervertebral motion on PPIVM assessment
- **Motion Palpation (PPIVM):**
 - Passive physiological intervertebral movements (FL, E, LF, ROT)
 - Passive segmental motion (movement between two bones)
 - Subjective so better intra- than inter- test reliability
 - NOT looking for a symptom response
 - Looking for intersegmental mobility
 - Patient must be relaxed
 - **Motor Control Examination:**
 - Motor Control Disorder Classification
 - Includes specific postural & movement control tests; specific muscle tests
 - **Muscle length tests:**
 - Tests the compliance / length of the muscles attaching to the lumbar spine and pelvis
 - This can affect posture – observe if a muscle looks tight (test if unsure)
 - Consider the effect of pain on musculoskeletal length / compliance
 - Muscles may test tight due to pain or increased resting muscle tone
 - Not pain provocation test (but document if pain is provoked)

- Compare the right and left sides
- **Assessment Conclusions:**
 - History & related patient interview information
 - Physical examination
 - Radiological imaging
 - Must correlate & integrate information

Overall assessment

- Area of the symptoms -where does it hurt??
- Structures involved (source) –lumbar spine level/ somatic/radicular/ muscles, ligaments
- Correlate impairments /activity/participation limitations that match patient's S and S's/ relevant clinical signs/radiology
- Establish involvement of the PNS/ CNS
- Establish and mark comparable signs points for re-Ax
- Exclude red flags
- Recognize presence of yellow flags

Patient Interview

- **Objectives:**
 - Find the patients main problems
 - Find the patients limitations in terms of the ICF model (impairment, activity, participation)
 - Find the patients expectations, beliefs and goals
- **Patient information**
 - Name
 - Gender
 - Dob of birth / age
 - Address / contact numbers

- **Patient interview:**
 - **Body chart** – areas of pain, other areas
 - Starting with the worst area, show me where you feel the pain / stiffness etc
 - Other there any other areas / referred pain (order of severity)
 - **Referred pain**
 - **Somatic referred pain**
 - Referred from musculoskeletal structures, ligaments, Zygapophyseal joints, muscles, discs and nerve roots
 - Deep, diffuse, hard to localize and achy quality
 - Usually not below the knee
 - **Radicular referred pain**
 - From irritation to nerve root
 - Shooting or lacerating, band like pain
 - Distribution or numbness, pins and needles
 - Dermatome map can be used to determine the level
 - Pins and needles
 - Numbness
 - CNS
 - Clear or tick any areas
 - For each pain – constant, intermittent, type of pain ie deep or superficial, and scale 0-10
 - **Aggravating or easing factors (irritability):**
 - What makes it worse – functional activities, movements, posture, positions etc
 - Lx: sitting, standing, walking, sit to stand, cough / sneeze
 - Be specific about the pain with ie sitting ie type of chair
 - Is there anything you can do to reduce the pain
 - **Irritability**
 - Aggravating factor / activity
 - Time to onset
 - Severity of pain intensity
 - After stop – time for symptoms to subside
 - **24 hour pattern:**
 - **Night pain:**
 - Inflammatory state or serious pathology
 - Spontaneous vs pain with movement ie rolling in bed
 - Ask sleep position / mattress
 - **Morning pain:**

- Wakes with pain and stiffness suggests inflammatory disorder
 - Wakes with stiffness – joint hypo-mobility, increase disc pressure
 - How long does this last
 - Is there a worst time of day
- **Current history (CHx):**
 - **Onset of symptoms** – how, when, why, how did it begin ie suddenly
 - **Progression** – same, better or worse
- **Treatment (Rx):**
 - Treatments and effects for this episode
 - Includes medical, pharmacological, PT, or other allied health treatment
 - Be specific if previous PT
- **Past history (PHx):**
 - Have you ever had this before
 - History of first event – how, when, why
 - Similar episodes – are they changing, frequency, severity, duration
 - Previous treatment and effect
- **Special questions:**
 - How is your general health? Virus?
 - Any unexplained weight loss or gain
 - Any serious operations or illnesses in the last 10 years
 - Cancer or thyroid problem
 - Cauda equina (CE) compression
 - Bladder or bowel problems
 - Saddle anesthesia or paresthesia
 - For this disorder, any other medical conditions
 - Long term corticosteroids (osteoporosis)
 - Anticoagulants (risk of bleeding)
 - Medication
 - Medical imaging
 - Xrays, scans, blood tests etc
 - Degenerative (age related) changes correlate poorly with symptoms
- **Red flags:**

- Does a serious disorder exist
- Serious pathology rare in acute LBP but still must be excluded through screening questions
- Most common serious pathology is spinal compression fracture
- General red flags include
 - Recent trauma – fracture
 - Severe pain with minor trauma – fragility (>50 yrs esp)
 - Unexplained weight loss
 - History of cancer
 - Fever with severe LBP
 - Pain worse at night but no relieved with rest
 - IV drug use / immune
 - Systemic symptoms – fever / malaise / ill health / weight loss / fatigue
 - Severe unremitting night pain
 - High pain levels or pain progressively getting worse
 - CNS / cord involvement
 - Multi-segmental or progressive neural involvement
 - Bowel or bladder / saddle paresthesia
 - Social history – occupation, recreation, activity level, hobbies, family support, environment
 - Functional impairment – work, exercise, sport, self care etc

- **Yellow flags:**

- Psychological, emotional, cognitive, behavioral, social, cultural and environmental factors
- If significant yellow flags – referral (GP, psychology, multidisciplinary team)
- Belief that back pain is harmful or disabling
- Fear avoidance behavior and reduced activity levels