Principles of Musculoskeletal Assessment

Introduction to Clinical Studies
Traumatology
RHS 231
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Purpose of Assessment:

• To understand the patient’s problem from the patient’s and clinician’s perspectives.

• “Diagnosis is only a way of applying one’s anatomy” (Cyriax, 1982).
When should physiotherapists assess patients?

• On first patient contact:
  – to determine the patient’s problem & treatment plan

• During the treatment:
  – to check improvement versus deterioration
When should physiotherapists assess patients?

• Following each treatment:
  – to judge the efficacy of the intervention

• At the beginning of each new treatment:
  – to determine the lasting effects of treatment and the effect of other activities on the patient’s signs & symptoms
Subjective & Objective Assessment

• **Symptoms** = what the person complains about (e.g., my knee hurts)

• **Signs** = what can be measured or tested (e.g., anterior drawer test for ACL injuries)
Subjective & Objective Assessment

• **Subjective** assessment:
  – to gather relevant information about the site, nature, and onset of symptoms
  – review the patient’s general health and past treatments

• **Objective** assessment:
  – to determine abnormalities using special tests (without bias)
Correct Diagnosis depends on:

1. Knowledge of functional anatomy
2. Accurate patient history
3. Diligent observation
4. Thorough examination
Differential Diagnosis involves:

- Clinical signs & symptoms
- Physical examination
- Knowledge of pathology & mechanisms of injury
- Provocative tests
- Laboratory & diagnostic imaging techniques
The Problem-oriented Medical Records Method: SOAP

- S = Subjective  (Patient History)
- O = Objective  (Observation)
- A = Assessment  (Examination)
- P = Plan
Assessment should be:

- Sequential
- Organized
- Comprehensive
- Reproducible
Total Musculoskeletal Assessment

- Patient History
- Observation
- Examination of movement
- Special tests
- Reflexes and cutaneous distribution
- Joint play movement
- Palpation
- Diagnostic imaging
Patient history

- Complete medical history with special emphasis on the portion with the greatest clinical relevance

- Listen to the patient

- Ask questions, but don’t lead the patient

- “Red flags”
Red flags

• **Cancer**: persistent pain at night, loss of appetite, unusual lumps

• **Cardiovascular**: shortness of breath, dizziness, constant calf pain, discolored feet, chest pain

• **Gastrointestinal / Genitourinary**: severe abdominal pain, heartburn, vomiting

• **Neurological**: changes in hearing or vision, severe headache, fainting, balance problems
Questions to ask:

• Age & occupation?
• Why has the patient come for help?
• Was there a trauma or repetitive activity?
  = The mechanism of injury
• Was the onset of the problem slow or sudden?
• Where are the symptoms that bother the patient?
• What are the movements or activities that aggravate or relieve the pain?
Pain Questions:

- How long has the problem existed? (acute, subacute, chronic pain)

- Are the intensity, duration, and frequency of pain changing? (pain scale)

- Is the pain associated with rest, activity, or certain postures?
Type of pain?

• **Nerve** pain: sharp, burning, run in the distribution of specific nerves

• **Muscle** pain: dull, aching, & hard to localize

• **Bone** pain: deep & very localized

• **Vascular** pain: diffuse, aching, poorly localized (referred to other areas)
Principles of Examination

- Test the normal (uninvolved) side first
- Active movements first, then passive, then resisted isometric movement
- Painful movements are done last
- Apply over pressure with care (if active ROM is restricted or to determine the end-feel)
- Myotomes testing: contractions must be held for 3-5 seconds
“Does it hurt when I do this?”
Spinal cord & Nerve roots

- **Dermatome** = the area of skin supplied by a single nerve root

- **Myotome** = group of muscles supplied by a single nerve root

- **Sclerotome** = an area of bone or fascia supplied by a single nerve root
Neurological testing

• **Dermatome**: may exhibit **sensory** changes for light touch and pin prick

• **Myotome**: assessed by performing isometric resisted tests held for 3-5 seconds
  
Neurological testing

- Reflexes:
  - *dull reflexes* → lower motor neurone dysfunction
  - *brisk reflexes* → upper motor neurone dysfunction
  - the quadriceps reflex (L3)
  - the achilles tendon reflex (S1)
Neurological testing

- Reflexes:
  - The quadriceps reflex
    ➢ L3
  - The achilles tendon reflex
    ➢ S1
Referred Pain

• Pain felt in a part of the body that is usually far from the tissue that have caused it.

• May be due to misinterpretation by the brain as to the source of the painful stimulus.

• Indicates that one of the structures innervated by a nerve root is causing signs & symptoms in other tissues supplied by that same nerve root.
Radiating (radicular) Pain

= Pain felt in a dermatome, myotome, or sclerotome because of direct involvement of a spinal nerve root.
Palpation

• After the tissue at fault has been identified, palpate for tenderness to determine the extent of the lesion within that tissue.

• When palpating, note:
  – Differences in tissue tension (muscle tone)
  – Tissue texture (swelling)
  – Tenderness
  – Temperature variation
Functional Assessment

• Measurement of a whole-body task performance ability
• Relates the effect of the injury on the patient’s life
• But first, establish what is important to the patient
• Should include repeated movements under different loads
Joint End Feel (passive ROM)

• = the sensation which the examiner feels in the joint as it reaches the end ROM

• There are 3 normal end feels:
  ➢ **Bone-to bone**: hard & painless (elbow extension)
  ➢ **Soft tissue approximation**: movement stops due to soft tissue compression (elbow & knee flexion)
  ➢ **Tissue stretch**: feeling of a springy or elastic resistance from the ligaments or capsule (Achilles tendon, or wrist flexion)
Joint End Feel

- Hard (Bony)
- Soft (Tissue apposition)
- Firm (Tissue & capsular stretch)
Joint End Feel

• Bony block to movement (hard feel) →
  arthritic joints

• An empty feel or resistance at the end of the range →
  may be due to severe pain associated with infection, active inflammation, or a tumor
Joint End Feel

- Springy block (rebound feel) at the knee → torn meniscus blocking knee extension

- Spasm (sudden, relatively hard feel) → muscle guarding

- Hard arrest of movement → capsular involvement
Joint Play (accessory) Movements

• = The small ROM that can be obtained by the examiner beyond the active ROM

• Joint dysfunction = loss of joint play movement

• Joint play mobilization should be done in a loose packed position
Joint Position

• **Loose packed** (resting) position = the position at which the joint is under the least amount of stress (capsule, ligaments, bone contact).

• **Close packed position** = the position in which the majority of joint structures are under maximum tension.