# Basics of Soft-Tissue Examination

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#### **Basics of Soft Tissue Exam**

- For practitioners who primarily use their hands to treat the human structure:
- Examination must include functional tests to determine the type of soft tissue creating the pain.

#### Use all of your senses

#### Observation:

 With observation of gait and stance, you can become aware of the abnormal tensions emanating from the patient





"If you look very carefully, you can see it's crap."

## **Observation of Gait (Ex)**



#### Use all of your senses

Palpation: confirmation of visual tensions

- Becomes an art: should literally "feel" the patient's pain
- Ex's: warm, nodular, lumpy, leathery, doughy, springy, taut





"The hand is the greatest diagnostic and therapeutic tool that has ever been, or will be, invented"

Karel Lewit

# Dr. James Cyriax The purpose of a soft tissue examination is to

He was a british physician, widely known as the father of Orthopedic Medicine. Orthopedic Medicine is based on his life's work. Orthopedic medicine is the examination, diagnosis and treatment of non-surgical lesions of the musculoskeletal system. It began in 1929 when Dr James Cyriax observed a number of patients where the diagnosis was vague and the treatment non-specific. There was no satisfactory method for testing the function of soft tissues to achieve a clinical diagnosis. He developed a system of assessment aiming to accurately diagnose lesions of the musculoskeletal system and a non-surgical method of treatment for soft tissue lesions by employing a process of diagnosis by selective tension, which uses passive movements to test the inert structures and resisted movements to test the contractile structures.



# Passive Testing

 Passive tissue refers to tissue that does not have its own contractile ability.

Such as:

#### , and

By definition, passive testing is neither active nor spontaneous and requires an examiner to perform the movement.

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Passive Testing Passive motion also measures the and and is used to evaluate

# END FEEL

#### 1. Bone to bone:

hard end feel

4. Capsular: firm end feel of normal joint

2. Soft Tissue: normal tissue approximation 5. Springy Block: hard rebound (always abnormal)

3. Spasm or "twang" passive movement stresses a fracture or inflamed joint (always abnormal) 6. Empty Feeling:

more movement is possible but severe pain (always abnormal)

## Hypermobility Evaluation

Hypermobile joints resulting in excessive motion This condition occurs in: Shoulder instability Patella dislocation **Ehlers-Danlos syndrome** Marfan syndrome **Rheumatoid** arthritis Osteogenesis imperfecta Systemic lupus erythematosus Poliomyelitis Myotonia congenita some neurologic conditions

### Hypermobility Evaluation

- A hypermobile patient would exhibit three or more of the following tests:
  - Passive thumb apposition to touch the forearm
  - Passive little finger hyperextension or more than 90 degrees
  - Elbow hyperextension of more than 10 degrees
  - Knee hyperextension of more than 10 degrees

 Forward flexion of the trunk with the knees straight and the palms of the hands resting flat on the floor























### **Contractile (Isometric) Testing**

**Contractile (Isometric) Testing** Contractile tissue refers to the muscular component and also to the tendon stressed by its contracting muscle. Includes the following: – Muscle belly Musculotendinous junction -Body of the tendon - Tendoperiosteal junction







**Contractile** (Isometric) Testing Cyriax emphasized testing the muscle to elicit maximum strength while the joint is in its most neutral position to reduce joint compression. • BUT, this can allow extra activity from a synergistic muscle, masking pain you are trying to elicit.

**Contractile (Isometric) Testing** Muscle testing creates some joint stress in any position. For this reason, passive testing should always be performed first to help rule out the passive joint structures.

### **Contractile (Isometric) Testing**

- When muscles are tested, the patient is asked to use maximum strength for at least 2 seconds.
- After muscle incrimination, palpation of the muscle for areas of tenderness and soft tissue abnormalities plus the effect of stretching the muscles on the passive examination helps pinpoint the particular site of contractile tissue at fault.

# Contractile (Isometric) Testing Interpretation of Muscle Testing

#### Contractile (Isometric) Testing

#### Muscle Grading Scale

- 5 "normal" with full ROM against gravity and full resistance
- 4 "good" with full ROM against gravity and some resistance
- 3 "fair" with full ROM against gravity, no resistance
- 2 "poor" with full ROM with gravity eliminated
- 1 "trace" with slight contractility and no ROM
- 0 "zero" with no evidence of contractility

## **Contractile (Isometric) Testing**

#### Clinical pearls

- Repetitive testing may be necessary to elicit the pain
- Pain after repetitive testing sometimes indicates an arterial blockage
- Pain occurring soon after maximal contraction rather than immediately after contraction is considered a positive result
- Isometric muscle testing is useful in emphasizing muscle atrophy
- Isometric force generation is greatest at the end ROM

## **Capsular Pattern**

#### Capsular Pattern

- Knowledge of capsular pattern improves diagnostic abilities.
- A capsular pattern refers to a particular sequence of passive limitation of motion in a joint controlled by muscles; this pattern affects
- Every joint has its own particular pattern of capsular limitation (ex. the earliest sign of the shoulder capsular pattern is limitation of external rotation by itself)
- If only a portion of the capsule is involved (shortened), only movements that stretch that portion of the capsule are involved instead of a capsular pattern.

#### Summation of Capsular Patterns of Passive Limitation

- Shoulder: most limited external rotation; next glenohumeral abduction, then internal rotation.
- Elbow: flexion usually more limited than extension; rotations full and painless except in advanced conditions.
- Wrist: equal limitation of flexion and extension; little limitation of ulnar and radial deviation.
- Trapezio metacarpal joint: only thumb abduction.
- Hip: most limited is internal rotation followed by flexion. Some limitation of abduction and little or no limitation of adduction and lateral rotation.
- Sign of the buttock: passive hip flexion more limited and more painful than straight-leg raise.

## Summation of Capsular Patterns of Passive Limitation (cont)

- Knee: more limitation of flexion than extension.
- Ankle: more limitation of plantarflexion than of dorsiflexion.
- Talocalcaneal joint: increasing limitation of varus until fixation in valgus.
- Midtarsal joint: limitation of adduction and internal rotation; other movements full.
- Big toe: much more limitation of extension and slight limitation of flexion.
- Cervical spine: equal limitation in all directions except for flexion, which is usually full.
- Thoracic spine: limitation of extension, side bending, and rotation; flexion is less limited.
- Lumbar spine: marked and equal limitation of side bending with limitation of flexion and extension.

#### **Tenderness and Palpation**

- Often, tissues that are embryologically related refer to the same area.
- As important as tenderness is, the clinician must rely first on a complete functional extremity examination of all the areas that can create the tenderness before tenderness can be accepted as the sine qua non.

A complete functional examination often gives the practitioner a working diagnosis.