

# TESTS OF FUNCTION

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# Tests of Function


- A test of function enables you to see, and feel the patient's complaints.
- The constellation of symptoms and signs that emerges from tests of function helps to
  - differentiate the nature of the structures involved in the dysfunction,
  - for example, whether these are muscles or joints and allows you to apply treatment specifically to those structures.

# Con....

- Tests of function are essential element of the OMT evaluation.
- *Function tests* **provide a tool** for the manual therapist
  - to confirm diagnostic hypotheses
  - measure progress
- By monitoring the patient's response to these tests during treatment, the practitioner can make clinical treatment decisions
  - to modify and improvise further treatment.

# Con.....

- A. Active and passive rotatoric (angular) movements:
  - Identify location, type (i.e., hypo- or hyper-mobility, and severity of dysfunction).
  - - *Standard movements*
  - - *Combined movements*
- B. Translatoric joint play movements:
  - Further differentiate articular from nonarticular lesions; identify directions of joint restrictions.

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- C. Resisted movements:
  - Test neuromuscular integrity and status of associated joints and vascular supply.
  - D. Passive soft tissue movements:
  - Differentiate joint from soft tissue dysfunction and the type of soft tissue involvement.
  - - *Physiological movements (muscle length .. .)*
  - - *Accessory movements (muscle play. . .)*
  - E. Additional tests

# Principles of function testing


## Assessing quantity of movement

### LARGER PASSIVE MOVEMENTS:

- Large passive movements (e.g., general spinal movements),
  - test range of movement slowly through an entire range to the first significant stop.

### SMALLER PASSIVE MOVEMENTS


- Smaller passive movements in joints with little range of movement such as the spinal segments,
  - test range of movement first with more rapid oscillatory movements that do not require stabilization of neighboring joints.

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- If these oscillatory tests reveal restrictions or symptomatic areas, follow up with more careful evaluation of the movement range using
  - slower movements and stabilization of the adjacent joints.

# Measuring rotatoric movement with a device

- The amount of active or passive joint movement can be measured with an instrument such as a
- goniometer,
- ruler,
- measuring tape
- other device (e.g., distance of fingertips to floor as measurement of standard rotatoric spine and hip movement).



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- Standard bone movements are measured from the zero position and take place around defined axes.
  - The results of this test may reveal


### **Hypomobility:**

- *defined as movement less than established norms.*

### **Hypermobility:**

- *defined as movement greater than established norms.*

- Note also that a joint can be hypomobile in one direction and hypermobile in another.

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- *Hypomobility or hypermobility are only pathological findings if they are associated with symptoms and a pathological end-feel.*
  - Hypomobility or hypermobility with a normal end-feel is usually due to a
    - congenital structural anomaly
    - normal anatomic variation
  - and is unlikely to be symptomatic or to benefit from mobilization treatment.

## Manual grading of rotatoric movement (0-to-6 scale)<sup>1</sup>

In joints with little range of motion such as the carpal joints or single spinal segments, it may be impossible or impractical to measure range of motion with a goniometer. Range of motion may then be classified manually using the following scale:

Hypomobility	[	0 = No movement (ankylosis)
		1 = Considerable decreased movement
		2 = Slight decreased movement
Normal		3 = Normal
Hypermobility	[	4 = Slight increased movement
		5 = Considerable increased movement
		6 = Complete instability

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*A joint can be both hypomobile in one direction and hypermobile in another.*

# Assessing quality of movement

- The ability to see *and feel* movement quality is of special significance, as **slight alterations** from normal may often be the **only clue** to correct diagnosis.
- Repeat each passive movement **at different speeds** to reveal various types of restrictions.
- For example, **slower passive** movements are more likely to reveal **joint restrictions**, while more **rapid** movements can trigger abnormal **muscle reactivity**.


# Quality of movement to the first stop

- Test movement quality by first observing the
- **ACTIVE MOVEMENT,**
- then feel the same movement **PASSIVELY** until you meet the first significant resistance.
- Apply minimal force and perform the movement slowly several times throughout the entire range of motion.
- **NOTE QUALITY OF MOVEMENT FROM THE VERY BEGINNING OF THE RANGE OF MOVEMENT UP TO THE FIRST STOP.**

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- Passive movements should be
    - free
    - smooth
  - Deviations from normal can often be detected as soon as you contact the patient or very early in the range of movement.
  - Be alert to slight abnormalities from the very instant you contact the patient.

# End-feel: Quality of movement after the first stop

- End-feel:
- End-feel is the sensation imparted to the practitioner at the limit of the available range of movement.
- End-feel is tested with a slight additional stretch after the first significant stop of a passive movement (**quality test**).
- Note that end-feel must be evaluated as part of a *passive movement test* - not simply with overpressure applied after an *active movement* (**quantity test**).
- End-feel can be evaluated during standard and combined passive rotatoric movements (**overpressure end-feel**)
- or during translatoric joint play movements (**joint play end-feel**).

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- ❑ It is important for a manual therapist to be able to differentiate **normal (physiological) from pathological end-feels.**
  - ❑ Evaluate end-feel slowly and carefully after a passive movement from the zero position (or actual resting position) through the entire range of movement past the first stop (a slight additional stretch) to the final stop.



# End feels

## Cyriax six end feels.

**Bone-to-bone** is an abrupt hard sensation when one bone engages with another bone.

This can be a normal or an abnormal end feel.

- Normal (e.g., elbow extension)
- Abnormal (e.g. when the bony end feel occurs before the end of the joint range).
- This can indicate an osteophyte or abnormal bony development.

# End feels

2. **Spasm** is a vibrant twang as the muscles around the joint spasm to arrest movement. A knee extension with hamstring spasm is one example.
  - This is an abnormal end feel and it is contraindicated to force the joint through more range to mobilize or manipulate. It can indicate acute or sub acute capsulitis or severe ligamentous injury.
3. **Capsular feel** is a firm arrest of movement with some give to it (i.e., stretching leather). This can be normal or an abnormal end feel.

Normal (e.g., glenohumeral lateral rotation)

# End feels



**4- Springy block** causes the joint to rebound at the end of range due to an internal articular derangement catching between the joint surfaces. This is an abnormal end feel. A knee extension with a meniscal tear or an elbow extension with a bone chip are two examples. This can indicate an intra-articular loose body.

**5- Tissue approximation** is range limited because of tissue compression. This is a normal end feel. A knee flexion with the lower leg against the posterior thigh is one example. Elbow flexion with the lower arm against the biceps muscle is another example.

# End feels

- 6-Empty end feel** occurs when considerable pain stops the movement before the end of range is met. There is no tissue resistance, yet the patient arrests movement due to pain. This is an abnormal end feel. Acute bursitis, extra-articular abscess, or neoplasm can be suspected.
- Extreme apprehension or fear of pain by the patient may also cause this end feel.
  - Not mentioned by Cyriax, but commonly found, is a normal tissue **stretch end feel**. This is due to a muscular, ligamentous, or fascial stretch (i.e., hip flexion with hamstring stretch).