

A Traumatised joint:

Effects of Stretching a Joint Beyond Passive Range of Motion



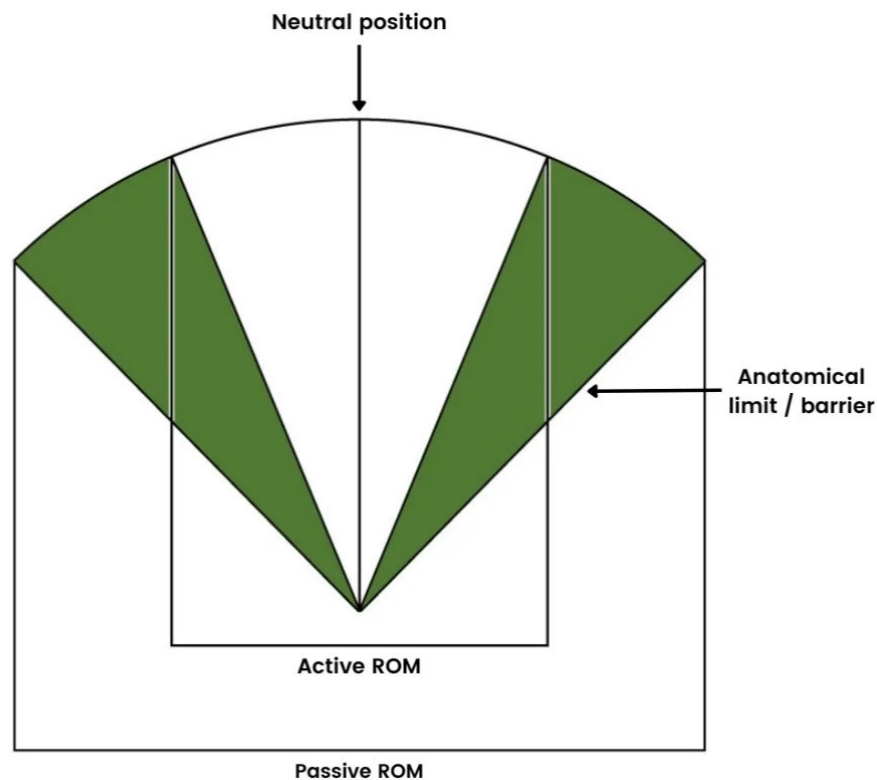
1. Protective Neuromuscular Reflexes

- **Muscle spindle response:** When muscles surrounding a joint are overstretched, muscle spindles activate, causing a reflex contraction to resist the stretch and stabilise the joint.
- **Golgi tendon organs (GTOs):** When excessive tension is detected, GTOs inhibit contraction to protect tendons. In a forceful overstretch, however, these protective mechanisms may fail, leading to microtrauma.

2. Capsuloligamentous and Neural Stress

- **Capsular and ligamentous strain:** Going beyond PROM overstresses passive stabilisers (ligaments, capsule). These tissues are rich in mechanoreceptors and nociceptors, so they send pain and alarm signals.
- **Neuromuscular guarding:** The central nervous system responds with protective muscle spasm to splint the joint.

- **Nerve irritation:** In some cases, peripheral nerves running across the joint may be tractioned, adding further neuromuscular inhibition.



3. Neuromuscular Inhibition and Instability

- **Arthrogenic muscle inhibition:** Injury to capsuloligamentous tissues disrupts sensory feedback, reflexively *turning down* stabilising muscles (e.g., Piriformis inhibition after a hip injury, rotator cuff inhibition after shoulder strain).
- **Altered recruitment:** Prime movers compensate, but they lack fine control. Over time this produces dysfunctional movement patterns and instability.
- **Proprioceptive decline:** Loss of mechanoreceptor input reduces joint position sense, increasing re-injury risk.

4. Chronic Neuromuscular Consequences

- Repeated overstretching can cause long-term proprioceptive deficits and persistent neuromuscular inhibition.

- This leads to **chronic instability syndromes** (e.g., recurrent joint sprains, altered gait).
- In severe cases, tissue remodeling and scar formation further impair normal neuromuscular function.

The Role of Neuromuscular Function Testing (NMFT) & Manual Muscle Testing (MMT)

1. Detecting Inhibition

- MMT/NMFT reveals **weakness in specific stabilising muscles** that should normally test strong.
- Example: After an shoulder sprain, Pectoralis Major muscles may test weak not due to structural rupture but due to **reflex inhibition** triggered by overstretched ligaments.
- This helps distinguish between true contractile weakness vs. **neuromuscular shutdown**.

2. Assessing Damage Extent

- By systematically testing muscles around the injured joint, the clinician can identify **which stabilisers are inhibited**.
- This pattern reflects the degree of **capsular/ligamentous strain and neurosensory disruption**.
- For example: in shoulder instability, inhibited rotator cuff muscles can be mapped through MMT/NMFT to show functional loss after joint overstretch.

3. Guiding Rehabilitation

- Baseline neuromuscular function testing provides a **starting point** to measure recovery.

- Repeated testing can demonstrate when stabilising muscles regain activation after interventions (manual therapy, proprioceptive training, neuromuscular re-education).
- Clinicians can use this feedback to **tailor exercise programs** and monitor healing.

4. Objective Documentation

- MMT/NMFT is a **clinical documentation tool**: it shows the neuromuscular consequences of overstretching and provides evidence of impairment for medical reports, insurance, or patient education.
- Patients often understand their injury better when shown how a key stabiliser muscle simply "shuts down" under manual testing.

✅ **In summary:** Stretching a joint beyond its passive ROM does not just risk structural injury — it disrupts neuromuscular control by triggering reflex inhibition, altering proprioception, and destabilising the joint. **Neuromuscular function testing and manual muscle testing** are powerful clinical tools to detect these negative effects, assess the extent of inhibition, and guide rehabilitation toward restoring stability and function.

Wolff Seminars equip clinicians with the insight and tools to uncover these hidden neuromuscular dysfunctions — often missed in conventional assessment.

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