BRIGHAM HEALTH

BRIGHAM AND WOMEN'S HOSPITAL

Multifidus Muscle Dysfunction

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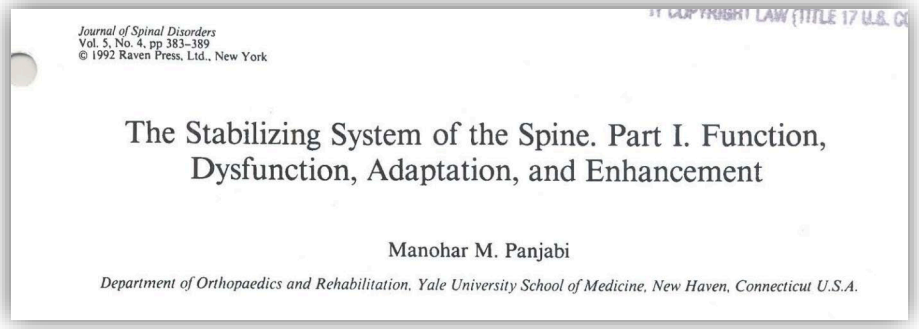
Stabilizing System of the Spine



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The Stabilizing System of the Spine. Part I. Function, Dysfunction, Adaptation, and Enhancement

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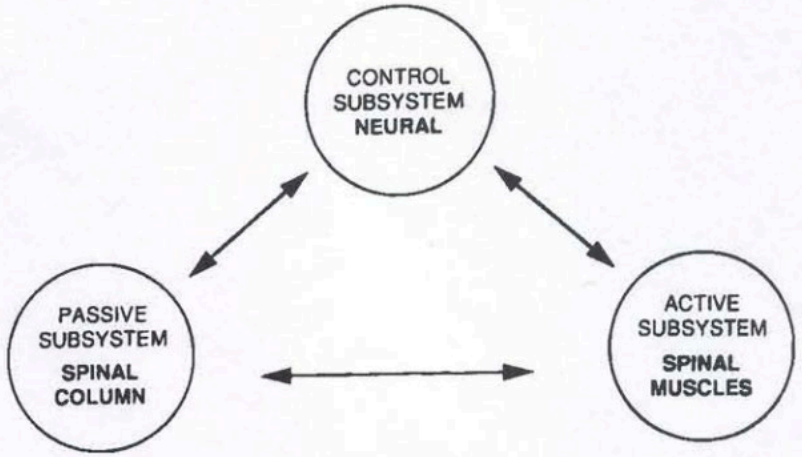


FIG. 1. The spinal stability system consists of three subsystems: passive spinal column, active spinal muscles, and neural control unit.

The normal function of the stabilizing system is to provide sufficient stability to the spine to match the instantaneously varying stability demands due to changes in posture and static and dynamic loads

- M.M. Panjabi (1992)[1]

Nociceptive Mechanical Low Back Pain

- Paraspinal muscles, fascia, ligaments, vertebrae, zygapophyseal and sacroiliac joints, intervertebral discs, and neurovascular structures are prone to different stressors.
- Each of these, alone or in combination, can contribute to low back pain.
- When neuromuscular control of the lumbar spine is impaired, consequent functional instability can cause various structures in the lumbar spine to be overloaded, generating noxious stimuli.
- Actual pain generator is not always clear.

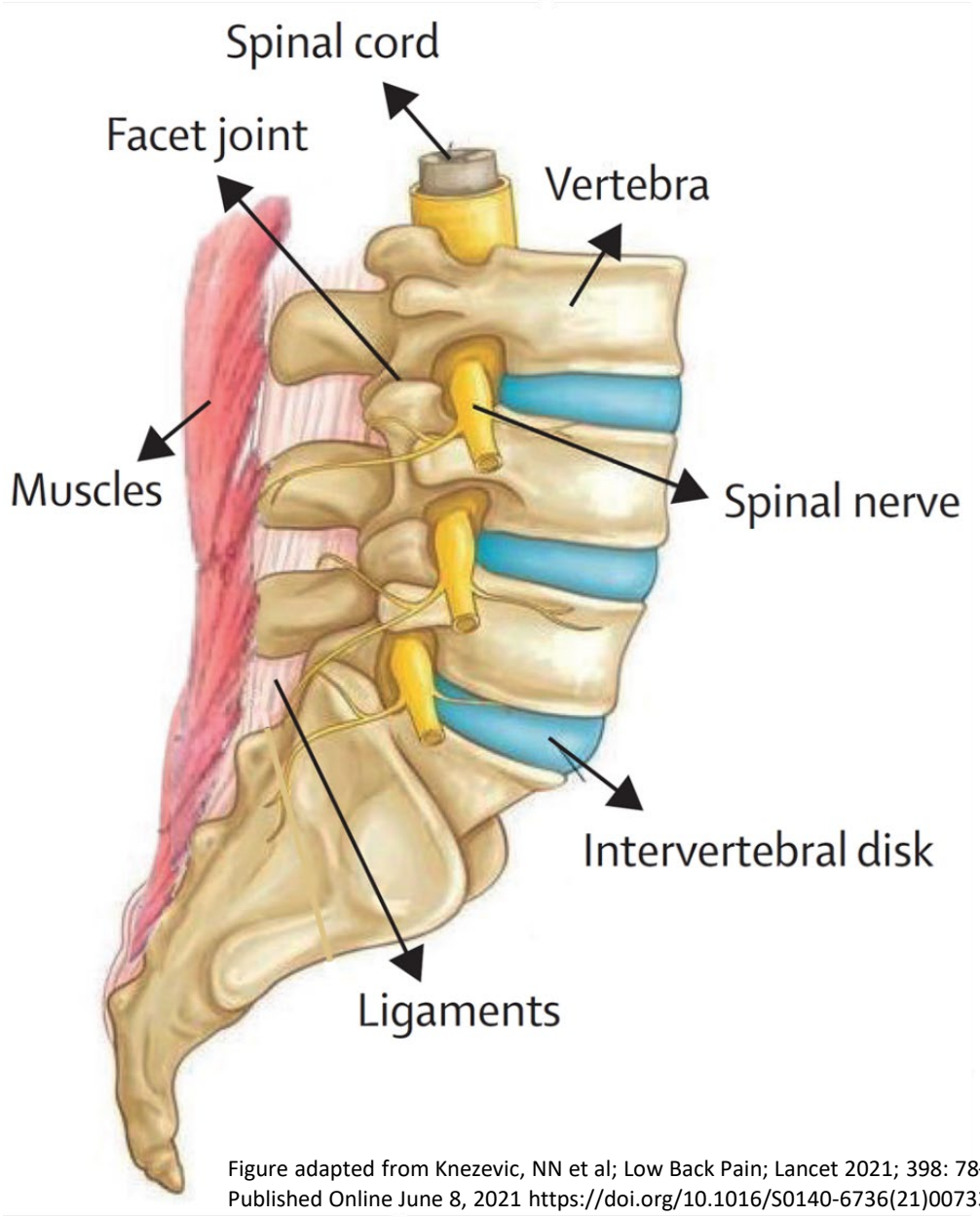


Figure adapted from Knezevic, NN et al; Low Back Pain; Lancet 2021; 398: 78–92
Published Online June 8, 2021 https://doi.org/10.1016/S0140-6736(21)00733-9

Core Function & Muscle System

Superficial

- Voluntary control
- Influence applied over a large region (fast twitch)
- Required for high load tasks i.e., lifting

Deep

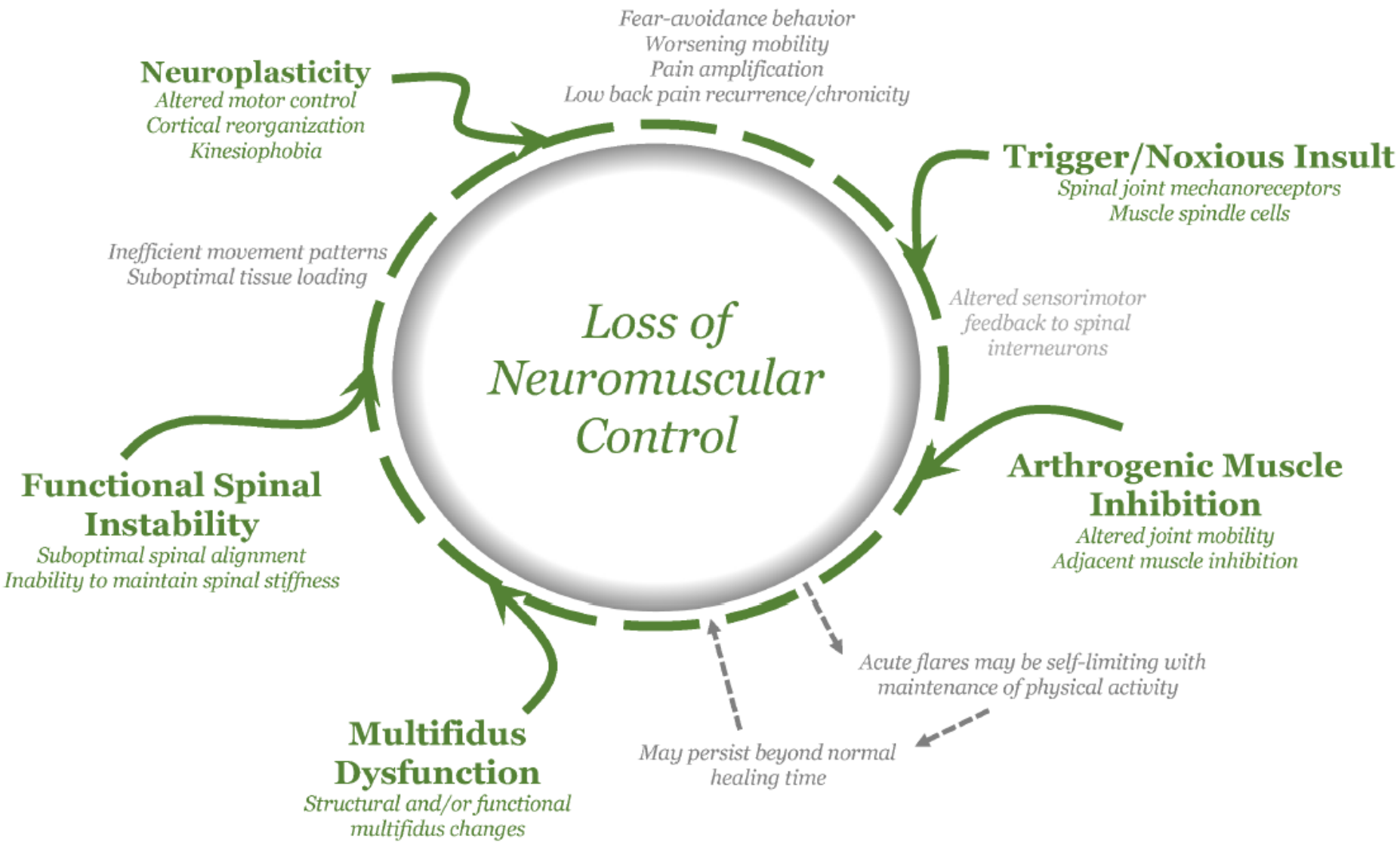
- Involuntary control of intervertebral motion, continence, breathing
- High number of muscle spindles (proprioceptive feedback)
- Provides intersegmental support for proper loading mechanics

Key Stabilizing Muscle

Multifidus Muscle

- Primary stabilizer of the lumbar spine[2]
- Key sensor for proprioceptive input
- Controlled involuntarily; contracts automatically to maintain stability
- Dysfunction of the multifidus is strongly associated with LBP[10]

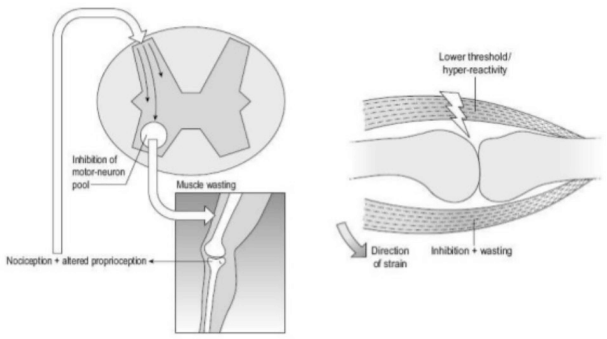
Contributions to Low Back Pain Recurrency and Chronicity



3. Vinicius Tieppo Francio, MD, MS and others, Multifidus dysfunction and restorative neurostimulation: a scoping review, Pain Medicine, 2023;, pnad098, https://doi.org/10.1093/pm/pnad098

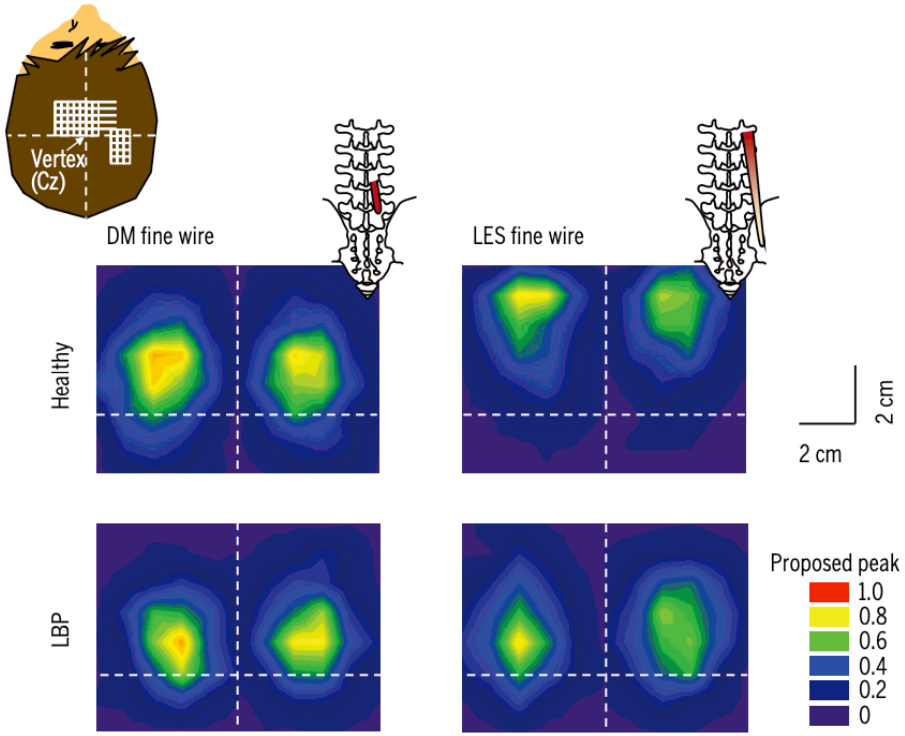
Contributors to Multifidus Dysfunction

Arthrogenic Inhibition[2,4]



Reflex Inhibition

Modified motor control[5,6,7]



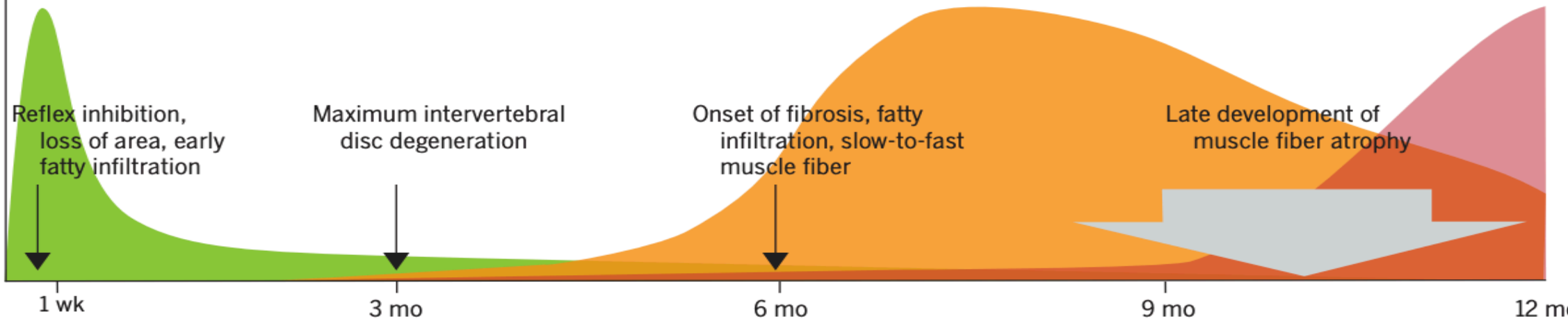
Disuse/Atrophy/Fat[8]

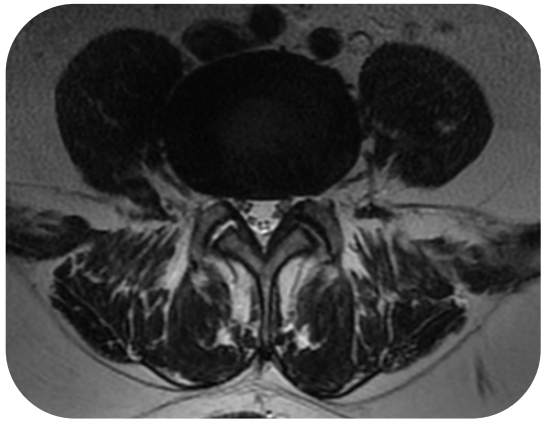
Muscle Dysfunction Phases[9]

Acute
Acute inhibitory/regeneration phase
- Muscle inhibition
- Acute size reduction (vascular/other mechanism)
- Acute adipose activation
- Regeneration pathway activation

Subacute-early chronic
Proinflammatory cytokine phase
- Slow-to-fast muscle fiber transformation
- Fibrosis
- Fatty infiltration

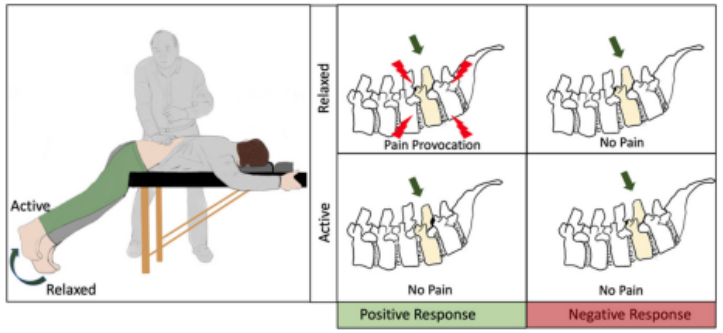
Chronic
Disuse/deconditioning phase
- Muscle/muscle fiber atrophy
- Fibrosis
- Fatty infiltration



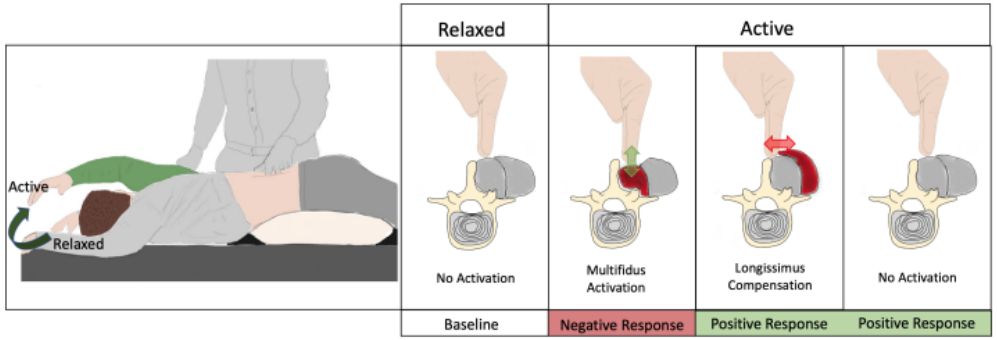


Identifying Multifidus Dysfunction[11]

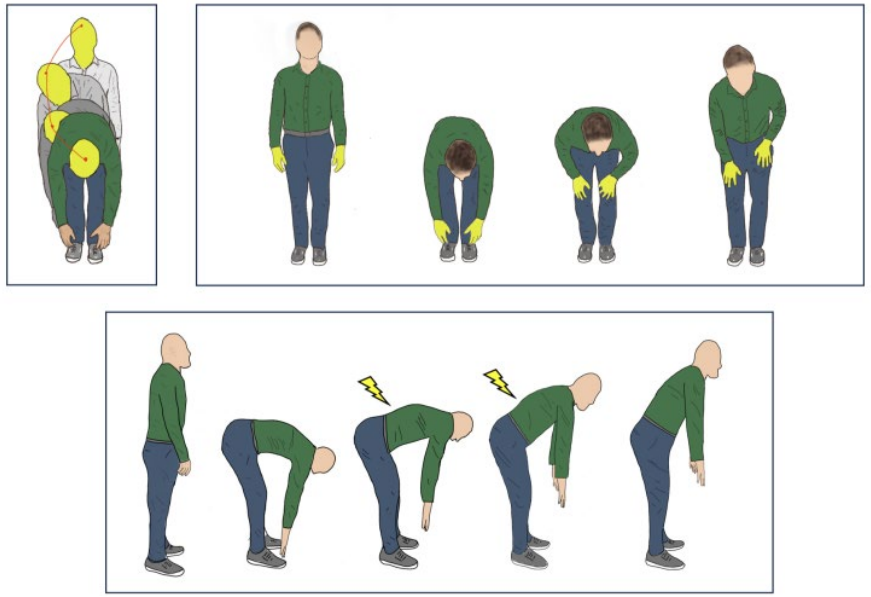
Prone Instability Test (PIT)



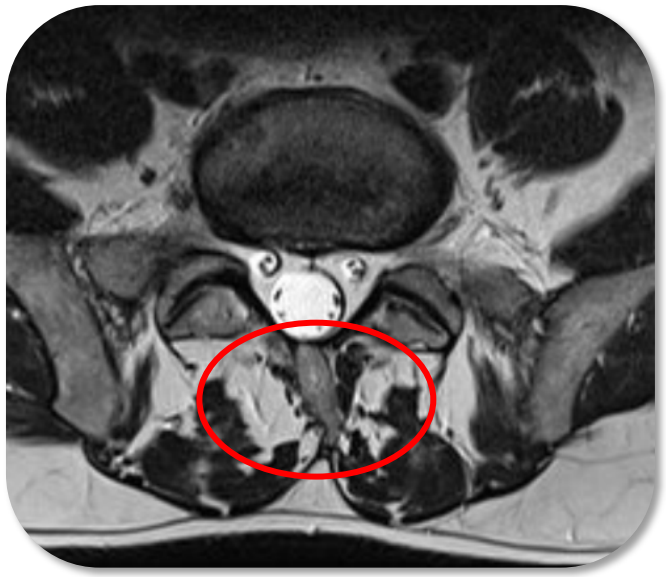
Multifidus Lift Test (MLT)



Aberrant Movements



MRI Observations



Conclusion

- Low back pain is only a symptom with many possible causes/etiologies.[12]
- Etiology-specific treatments therefore require equally specific diagnostic coding.[13]
  - For example, recently specific ICD-10-CM coding was created to document vertebrogenic low back pain (M54.51) which can be effectively treated with basivertebral nerve ablation.
  - Low back pain secondary to multifidus muscle dysfunction can be effectively treated with restorative neurostimulation, but there currently is no ICD-10-CM code to describe Multifidus Muscle Dysfunction.
- Requested Addition:

M62.8 Other specified disorders of muscle
Excludes2: nontraumatic hematoma of muscle (M79.81)
M62.81 Muscle weakness (generalized)
Excludes1: muscle weakness in sarcopenia (M62.84)
M62.82 Rhabdomyolysis
Excludes1: traumatic rhabdomyolysis (T79.6)
M62.83 Muscle spasm
M62.830 Muscle spasm of back
M62.831 Muscle spasm of calf Charley-horse
M62.838 Other muscle spasm
M62.84 Sarcopenia
Age-related sarcopenia
New Code M62.85 Dysfunction of the multifidus muscles, lumbar region
M62.89 Other specified disorders of muscle

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