Dynamic Chiropractic

MUSCULOSKELETAL PAIN

Lower Crossed Syndrome and Knee Pain

Perry Nickelston, DC, FMS, SFMA

You have a patient with persistent knee pain. Objective tests (X-rays, MRI, orthopedic tests) are unremarkable. Standard physical therapy and rehabilitation protocols have helped minimally at best. What do you do? Is it time to give up and send them to a specialist? Not just yet. Look a little deeper into the likelihood of a muscular imbalance condition known as the lower crossed syndrome (LCS).

LCS is based on Dr. Vladimer Janda's work in researching and understanding the pattern of muscular compensation and postural imbalances in the body. These imbalances contribute to habitual overuse in isolated joints and faulty movement patterns, creating repetitive microtrauma, dysfunction and chronic injury.

The primary muscles involved in LCS are as follows (see chart at right). Muscle imbalances can be caused by postural stress, pattern overload, repetitive movement, lack of core strength, lack of neuromuscular control, immobilization, and decreased tissue recoverability following activity. These muscle imbalances result in *reciprocal inhibition, synergistic dominance* and arthrokinetic (joint) dysfunction.

Reciprocal inhibition is the neuromuscular condition that occurs when increased neural drive in a specific muscle causes decreased neural drive to that muscle's functional antagonist. For example, if an individual has increased neural drive or tightness in the iliopsoas (very common), then the functional antagonist (gluteus maximus) can have decreased neural drive, resulting in muscular inhibition, weakness and synergistic dominance.

Typically Tighten and Shorten
Iliopsoas
Rectus femoris
Erector spinae group: thoracolumbar lumbosacral L5-S1
Quadratus lumborum
TFL/iliotibial band
Short adductors
Hamstrings
Piriformis
Gastrocnemius
Typically Weaken
Abdominal group

Gluteus medius

Gluteus maximus

VMO

Tibialis anterior

Plantar fascia

Synergistic dominance occurs when synergists take over function for weak or inhibited prime movers, causing faulty movement patterns and tissue overload. In the above example, if the gluteus maximus has decreased neural drive, synergist (hamstrings), stabilizers (erector spinae), and neutralizers (piriformis) substitute and become overactive. This leads to altered force-couple relationships, joint dysfunction and chronic subluxations.

Having tightness or hyperactivity in the iliopsoas can cause knee pain. The gluteus maximus (GM) is primarily responsible for eccentric deceleration of hip flexion, internal rotation and adduction. Weakness or inhibition of the GM increases sacral rotation and stresses the tibiofemoral joint, leading to patellar tendonitis. This alters the length-tense relationship of several muscles. The gluteus medius is weakened, taking away its ability to perform hip abduction. The TFL and iliotibial band begin to compensate, and this overactivity inhibits the vastus medialis oblique (VMO), increasing femoral flexion, internal rotation and adduction. This increases stress to the tibiofemoral joint and the patellofemoral joint. And to think, all of this resulted from weak and overactive muscles.

So, how do you fix it? Good question. The following protocols have proven to be very effective in helping to reverse this syndrome.

- Muscular adhesions and active/latent trigger points must be removed before attempting any stretching or strengthening program. Failure to do so will result in further muscular inhibition. Perform myofascial release (MFR) and trigger-point massage (TP) to muscles in the LCS chart above. Pay special attention to the gluteus muscles, iliopsoas and TFL. Be sure to check the soleus muscles, too. An overactive soleus can result in decreased toe-off motion of the foot during the gait cycle, causing faulty lower back mechanics.
- Ultrasound 5 minutes (1.5 W.c2 constant) on the gluteus medius and/or TFL, or you may substitute laser therapy, 150 joules per point. The sacrotuberous ligament also may require attention.
- Self-myofascial release with biofoam roller massage on all muscles listed in the chart.
- Chiropractic adjustments to the *hypo*mobile sacroiliac joint and lumbar spine. Be careful not to adjust the *hyper*mobile sacroiliac side. Hypermobility can result from lack of muscular support due to the reciprocal inhibition, thus mimicking a subluxated joint.
- Wobble and/or BAPS board for five minutes, two to three times per week. Start with both legs and then progress to single-leg stance. Progress to the patient performing the routine with eyes closed.
- Patients should be instructed on core stabilization exercises for the transverse abdominus muscle (TA) and lumbar multifidus. Perform the "draw-in" maneuver daily for five minutes by alternating 30-second intervals while breathing normally.
- Yoga poses: warrior #1 and #2. Patient must actively contract the gluteus maximus during these maneuvers to inhibit the iliopsoas, allowing for a more effective stretch. Progress to isometric frontal and side plank maneuvers for the TA.

To stay on the cutting edge of patient care today, you need to follow a comprehensive, systematic and

integrated functional approach to kinetic-chain diagnosis. A comprehensive LCS rehabilitation program improves dynamic postural control, ensures appropriate muscular balance and improves neuromuscular efficiency throughout the entire kinetic chain. So, the next time you have a patient with persistent knee pain, don't forget to look "outside of the box," or in this case, outside of the knee.

Resources

1. Clark MA. "Integrated Flexibility Training." National Academy of Sports Medicine: Thousand Oaks, CA, 2000.
2. Janda V. Muscle spasm - a proposed procedure for differential diagnosis. *Manual Medicine,* 1991:6136-6139.
3. Alter MJ. *Science of Flexibility, 2nd Edition.* Human Kinetics, 1996.

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