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The Psoas Muscles and Abdominal Exercises for Back Pain

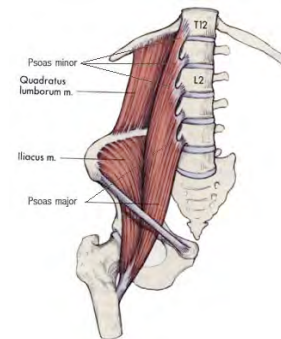
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Common opinion notwithstanding, the proper purpose of abdominal exercises is to improve coordination of the abdominal muscles with the other muscles of the trunk and legs (which include the psoas muscles), to improve alignment, and not to strengthen the back (a nonsensical proposition if one thinks about it). When the psoas muscles achieve their proper length and responsiveness, they stabilize the lumbar spine, giving the feeling of better support and "strength," and cause the spine and abdomen to fall back, giving the appearance of "strong" abdominal muscles. To improve psoas functioning, a different approach to abdominal exercises than the one commonly practiced is necessary. Instead of "strengthening," the emphasis must be on awareness, control, balancing and coordination of the involved muscles - the purview of somatic education.

A discussion of the methods and techniques of somatic education is beyond the scope of this paper, which confines itself to a discussion of the relation of the psoas muscles, abdominal exercises, and back pain. (For a view of self-help techniques, click excerpt. For a discussion of methods and techniques of somatic education, article.)

The Relationship of Psoas, Abdominal Muscles and Back Pain

The psoas muscles and the abdominal muscles are agonist and antagonist as well as synergists; a free interplay between the two is appropriate. The psoas muscles lie behind the abdominal contents, running from the lumbar spine to the inner thighs near the hip joints (lesser trochanters); the abdominal muscles lie in front of the abdominal contents, running from the lower borders of the ribs (with the rectus muscles as high as the nipples) to the frontal lines of the pelvis.



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Take a moment to contemplate each of these relationships:

- In the standing position, contracted psoas muscles (which ride over the pubic crests) move the pubis backward; the abdominal muscles move the pubis forward. (Antagonists)
- In walking, the ilio-psoas muscles of one side initiate movement of that leg forward, while the abdominals bring the same-side hip and pubis forward. (Synergists)
- The psoas major muscles pull the lumbar spine forward; the abdominal muscles push the lumbar spine back (via pressure on abdominal contents and change of pelvic position). (Antagonists)
- The psoas minor muscles pull the fronts of attached vertebrae (at the level of the diaphragm), down and back; the abdominals push the same area back. (Synergists)
- Unilateral contraction of the psoas muscles causes rotation of the torso away from the side of contraction and side bending toward the side of contraction (as if leaning to one side and looking over ones raised shoulder); abdominals assist that movement.

Now, if this all sounds complicated, it is -- to the mind. But if you have good use and coordination of those muscles, it's simple -- you move well.

Words on Abdominal Exercises

Exercises that attempt to flatten the belly (e.g., crunches) generally produce a set pattern in which the abdominal muscles merely overpower psoas and spinal extensor muscles that are already set at too high a level of tension.

High abdominal muscle tone from abdominal crunches interferes with the ability to stand fully erect, as the contracted abdominal muscles drag the front of the ribs down. Numerous consequences follow: (1) breathing is impaired, (2) compression of abdominal contents results, impeding circulation, (3) deprived of the pumping effect of motion on



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fluid circulation, the lumbar plexus, which is embedded in the psoas, becomes less functional (slowed circulation slows tissue nutrition and removal of metabolic waste; nerve plexus metabolism slows; chronic constipation often results), (4) displacement of the centers of gravity of the body's segments from a vertical arrangement (standing or sitting) deprives them of support; gravity then drags them down and further in the direction of displacement; muscular involvement (at the back of the body) then becomes necessary to counteract what is, in effect, a movement toward collapse. This muscular effort (a) taxes the body's vital resources, (b) introduces strain in the involved musculature (e.g., the extensors of the back), and (c) sets the stage for back pain and back injury.

The psoas has often been portrayed as the villain in back pain, and exercise is often intended to "knock the psoas out" (overpower it). However, it is obvious from the foregoing that "inconvenient" consequences result from that strategy. A more fitting approach is to balance the interaction of the psoas and abdominal muscles.

When the psoas and the abdominal muscles counterbalance each other, the psoas muscles contract and relax, shorten and lengthen appropriately in movement. The lumbar curve, rather than increasing, decreases; the back flattens and the abdominal contents move back into the abdominal cavity, where they are supported instead of hanging forward.

It should be noted that the pelvic orientation, and thus the spinal curves, is also largely determined by the musculature and connective tissue of the legs, which connect the legs with the pelvis and torso. If the legs are not directly beneath the pelvis, but are somewhat behind (or more rarely, ahead of the pelvis), stresses are introduced through muscles and connective tissue that displace the pelvis. Rotation of the pelvis, hip height asymmetry, and/or excessive lordosis (or, more rarely, kyphosis) follow, all of which affect the psoas/abdominal interplay.



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Where movement, visceral function, and freedom from back pain are concerned, proper support from the legs is as important as the free, reciprocal interplay of the psoas and abdominal muscles.

More on the Psoas and Walking

Dr. Ida P. Rolf described the psoas as the initiator of walking:

Let us be clear about this: the legs do not originate movement in the walk of a balanced body; the legs support and follow. Movement is initiated in the trunk and transmitted to the legs through the medium of the psoas. (Rolf, 1977: *Rolfing, the Integration of Human Structures*, pg. 118).

A casual interpretation of this description might be that the psoas initiates hip flexion by bringing the thigh forward. It's not quite as simple as that.

By its location, the psoas is also a rotator of the thigh. It passes down and forward from the lumbar spine, over the pubic crest, before its tendon passes back to its insertion at the lesser trochanter of the thigh. Shortening of the psoas pulls upon that tendon, which pulls the medial aspect of the thigh forward, inducing rotation, knee outward.

In healthy functioning, two actions regulate that tendency to knee-outward turning: (1) the same side of the pelvis rotates forward by action involving the iliacus muscle, the internal oblique (which is functionally continuous with the iliacus by its common insertion at the iliac crest) and the external oblique of the other side and (2) the gluteus minimus, which passes backward from below the iliac crest to the greater trochanter, assists the psoas in bringing the thigh forward, while counter-balancing its tendency to rotate the thigh outward. The glutei minimi are internal rotators, as well as flexors, of the thigh at the hip joint. They function synergistically with the psoas.

This synergy causes forward movement of the thigh, aided by the forward movement of the same side of the pelvis. The movement functionally originates from the somatic



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center, through which the psoas passes on its way to the lumbar spine. Thus, Dr. Rolf's observation of the role of the psoas in initiating walking is explained.

Interestingly, the abdominals aid walking by assisting the pelvic rotational movement described, by means of their attachments along the anterior border of the pelvis. Thus, the interplay of psoas and abdominals is explained.

When the psoas fails to lengthen properly, the same side of the pelvis is restricted in its ability to move backward (and to permit its other side to move forward). Co-contracted glutei minimi frequently accompany the contracted psoas of the same side, as does chronic constipation (for reasons described earlier). The co-contraction drags the front of the pelvis down. The lumbar spine is bent forward, tending toward a forward-leaning posture, which the extensors of the lumbar spine counter to keep the person upright; as the spinal extensors contract, they suffer muscle fatigue and soreness. Thus, the correlation of tight psoas and back pain is explained.

As explained before, to tighten the abdominal muscles as a solution for this stressful situation is a misguided effort. What is needed is to improve the responsiveness of the psoas and glutei minimi, which includes their ability to relax.

A final interesting note brings the center (psoas) into relation with the periphery (feet). In healthy, well-integrated walking, the feet assist the psoas and glutei minimi in bringing the thigh forward. The phenomenon is known as "spring in the step."

Here's the description: When the thigh is farthest back, in walking, the ankle is most dorsi-flexed. That means that the calf muscles and hip flexors are at their fullest stretch and primed for the stretch (myotatic) reflex. This is what happens in well-integrated walking: assisted by the stretch reflex, the plantar flexors of the feet put spring in the step, which assists the flexors of the hip joints in bringing the thigh forward.

Here's what makes it particularly interesting: when the plantar flexors fail to respond in a lively fashion, the burden of bringing the thigh forward falls heavily upon the psoas and



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other hip joint flexors, which become conditioned to maintain a heightened state of tension, and there we are: tight psoas and back pain. (Note that ineffective dorsi-flexors of the feet prevent adequate foot clearance of the ground, when walking; the hip flexors must compensate by lifting the knee higher, leading to a similar problem.)

Thus, it appears that the responsibility for problems with the psoas falls (in part, if not largely) upon the feet. No resolution of psoas problems can be expected without proper functioning of the lower legs and feet.

SUMMARY

The psoas, iliacus, abdominals, spinal extensors, hip joint flexors and extensors, and flexors of the ankles/feet are all inter-related in walking movements. Interference with their interplay (generally through over-contraction or non-responsiveness of one or more of these "players") leads to dysfunction and to back pain. The strategy of strengthening the abdominal muscles has been shown to be a misguided effort to correct problems that usually lie elsewhere - which explains why, even though abdominal strengthening exercises are so popular, back pain is still so common. Sensory-motor training (somatic education) provides a more pertinent and effective approach to the problem of back pain than abdominal strengthening exercises.

Click for preview of the somatic training program: Free Your Psoas.

For a discussion of somatic education, the reader is referred to "Clinical Somatic Education - a New Discipline in the Field of Health Care," by Thomas Hanna, Ph.D.

Get Out There and GoFast~

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