PERFORMANCE
BASEBALL/SOFTBALL
CONDITIONING
A NEWSLETTER DEDICATED TO IMPROVING BASEBALL AND SOFTBALL PLAYERS
www.performancecondition.com/baseballsoftball

# CAUTIOUS CONSIDERATION WITH HIP FLEXOR TRAINING

***Lisa Bartels, DPT, Postural Restoration Institute, Lincoln, NE***


Lisa Bartels

*Lisa was a member of the University of Nebraska volleyball team from 1995-1997. She was introduced to the science of Postural Restoration as a patient under the care of Ron Hruska. She had suffered from long-standing injuries sustained during her collegiate volleyball career and found success with the treatment techniques she learned at the Hruska Clinic and later received from the Postural Restoration Institute. Lisa returned to practice physical therapy at the Hruska Clinic Restorative Physical Therapy Services in Lincoln, Nebraska after completing her Doctorate of Physical Therapy from the University of Nebraska Medical Center in Omaha. Lisa is a member of the American Physical Therapy Association.*

BEG INT ADV

Many baseball conditioning professionals emphasize strengthening of the hip flexors, as part of their training programs, to enhance the explosive propulsion of the legs and trunk forward in activities such as sprinting and swinging a baseball bat. But what about the role hip flexors play in resting position and alignment of the pelvis and lumbar spine? Hip flexors are one of several muscular groups that function as primary stabilizers of the trunk. In other words, they help to control posture and produce torque about the trunk for movement. If the hip flexors become overly short and tight secondary to sport demands and/or overtraining, they can assist in pulling the pelvis into an anterior tilt and the lower spine into hyperextension.

Anterior pelvic tilt is a very common postural discord issue in competitive athletes. The reason for this is because the hip flexors are generally already very strong in athletes simply because of functional gait. Functional gait whether it be walking or sprinting demands forward motion in the sagittal plane, and the hip flexor group has powerful leverage to generate forward motion in the sagittal plane. Unfortunately, if an athlete remains in an anterior pelvic tilt position, neuromuscular adaptation occurs and the muscles around the spine and pelvis begin to function erroneously and various pain patterns can begin to emerge. To understand this concept a brief and general description of the anatomy and function of the hip flexors is needed.

The primary hip flexors are the psoas, iliacus, tensor fascia latae (TFL), and rectus femoris. All of these muscles run in front of, or anterior to the hip joint and attach distally on the femur or thigh. It is easy to visualize the mechanical advantage these muscles possess to flex the hip by rotating the femur up in a fixed pelvis, in other words knee towards chest movement. All of these muscles with the exception of the psoas attach proximally on the pelvis. The psoas has attachments along the last or 12th thoracic vertebrae and all five lumbar vertebrae including all intervertebral discs (Figure 1). The pelvis will therefore rotate anteriorly if the legs are fixed to the ground during hip flexor contraction. Anterior tilt of the pelvis equates with increased extension or lordosis at the lumbar spine because of the pull of the psoas on the spine and the force couple between the hip flexors and the back extensors.

## Psoas and Iliacus Muscles
### Action

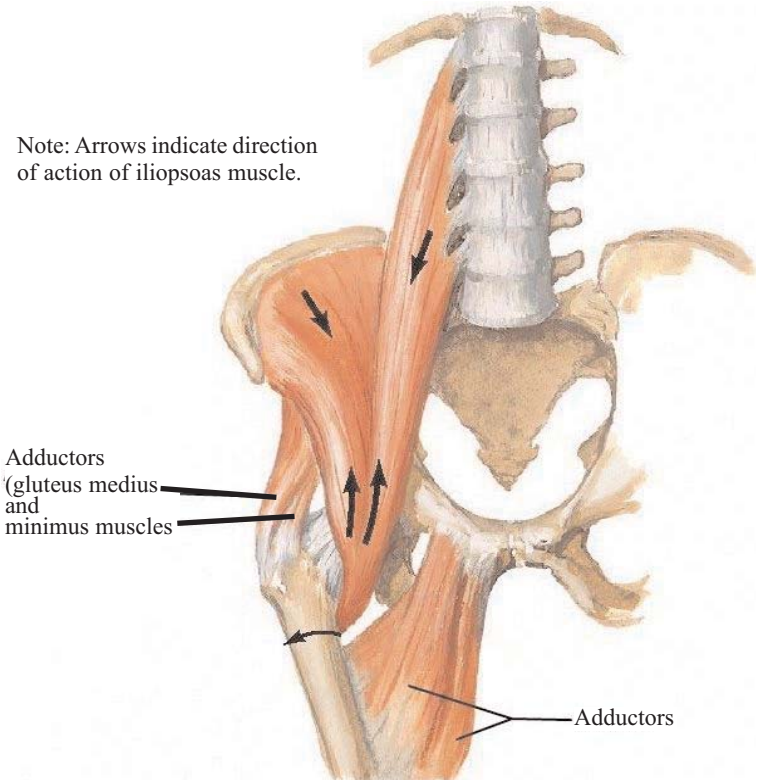



*Figure 1*

Maintaining balanced movement and a neutral position of the pelvis is dependent upon synergistic muscle activity. For example, when the hip flexors engage, muscles must be co-contracting in an opposite direction to neutralize or oppose the anterior pelvic tilt poten-

tial of the hip flexor muscles. In an acquired position of anterior pelvic tilt, this synergistic muscle activity will be lost because the length tension relationships of paired lumbo-pelvic musculature have been altered. Lumbo-pelvic musculature such as the hamstrings, glutes, and adductors lose their optimal mechanical advantage to oppose anterior pelvic tilt, and the hip flexors become more and more utilized, not only for sagittal plane motion, but for hip rotation as well. For example, the TFL has the mechanical advantage to assist with hip internal rotation and hip abduction. The gluteus medius also functions in this capacity. But if anterior pelvic tilt is acquired, the altered position of the gluteus medius makes it ineffective to generate effective force and the TFL continues functioning unopposed. This can dramatically alter the force couples around the hips and knees. Another example is the psoas, which in addition to producing hip flexion torque also has the mechanical advantage to assist with hip external rotation. The gluteus maximus also functions as a hip external rotator, but it can't effectively oppose the psoas when the pelvis is in anterior pelvic tilt.

There is a relatively simple solution to preventing overuse and adaptive shortening of the hip flexors. Incorporate training strategies that facilitate posterior pelvic rotation into workouts. Hamstrings, hip adductors, and glutes are all muscles that produce muscular torque about the pelvis in the direction of posterior rotation; therefore they inhibit the hip flexors. Figures 2, 3, and 4 are just some of the activities the Postural Restoration Institute™ uses with athletes to facilitate posterior pelvic rotation. Some of these can easily be implemented during practices or training. Figures 5 and 6 are stretching techniques that can be utilized after inhibition techniques, so when the stretch is being applied, the muscle is relatively relaxed and will more easily lengthen.

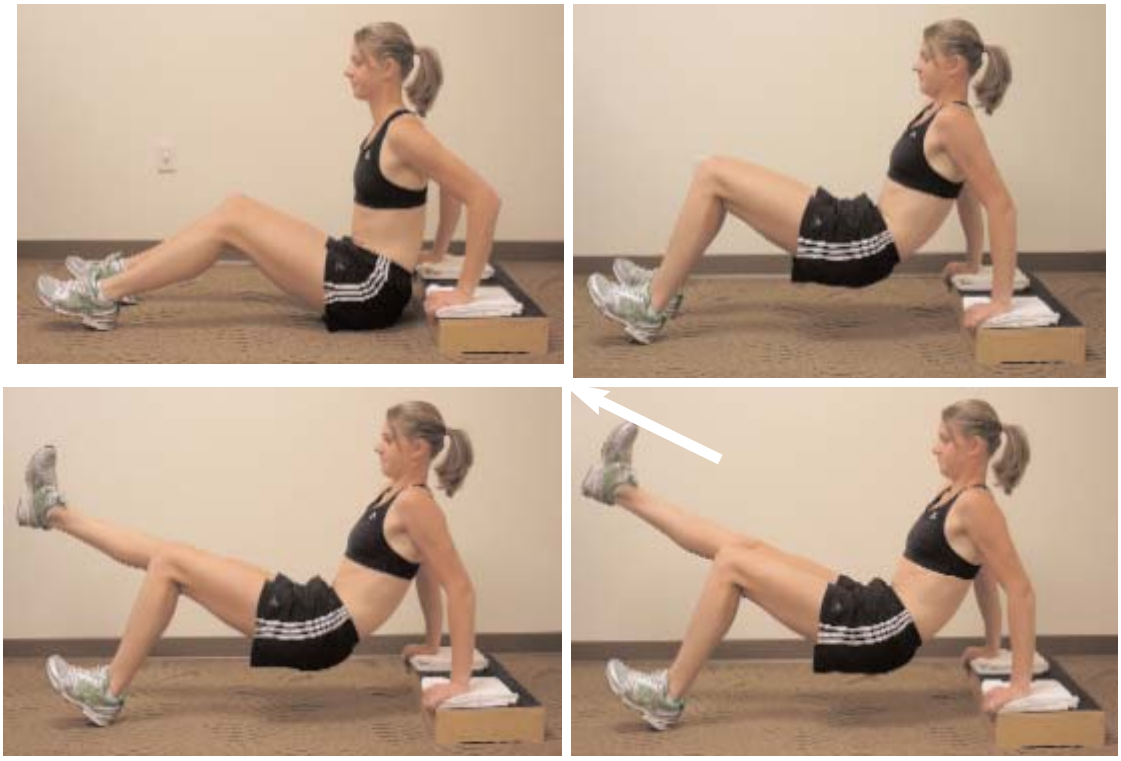
In conclusion, hip flexor training does not necessarily need to be avoided, but it is beneficial to understand the negative influence this muscle group can have on the resting position of the pelvis and spine. Athletes will be less prone to injury if training activities that inhibit the hip flexors are integrated into their workouts.

**More Information Please!** To contact Lisa or learn more about Postural Restoration by go to www.posturalrestoration.com or www.hruskaclinic.com.

Acknowledgement Figure 1: Taken from Netter F. The Netter Presenter, 2009 Elsevier Inc.

*Figure 2*

**1.** Stand away from a wall.
**2.** Squat down until your knees are maximally bent.
**3.** Reach forward with your hands as you attempt to maintain your bodyweight through your heels not your toes. Your back should be rounded and relaxed.
**4.** Keeping your hands reaching forward and your back rounded, slowly begin to raise your bottom up by straightening your knees as you push through your heels.
**5.** Continue to stand up as your back stays maximally rounded. Once you are upright, your knees should still be slightly bent.
**6.** Relax and repeat 4 more times.



**1.** Place both of your palms on a 3-4 inch block and place your feet directly in front of you.
**2.** Pull your shoulder blades down and together.
**3.** Dig both of your heels into the floor and push down with your arms lifting your hips off the floor. You should feel the muscles on the back of your thighs and shoulder blades engage.
**4.** Once your hips are in the air, round your back by tucking your bottom up.
**5.** Continue to dig both of your heels into the floor as you move your hips slightly forward or away from the block.
**6.** Keeping your hips forward and your shoulders pulled together, pick your right foot off the floor. You should feel the back of your left thigh engage.
**7.** Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
**8.** Relax and repeat 4 more times.

*Figure 3*

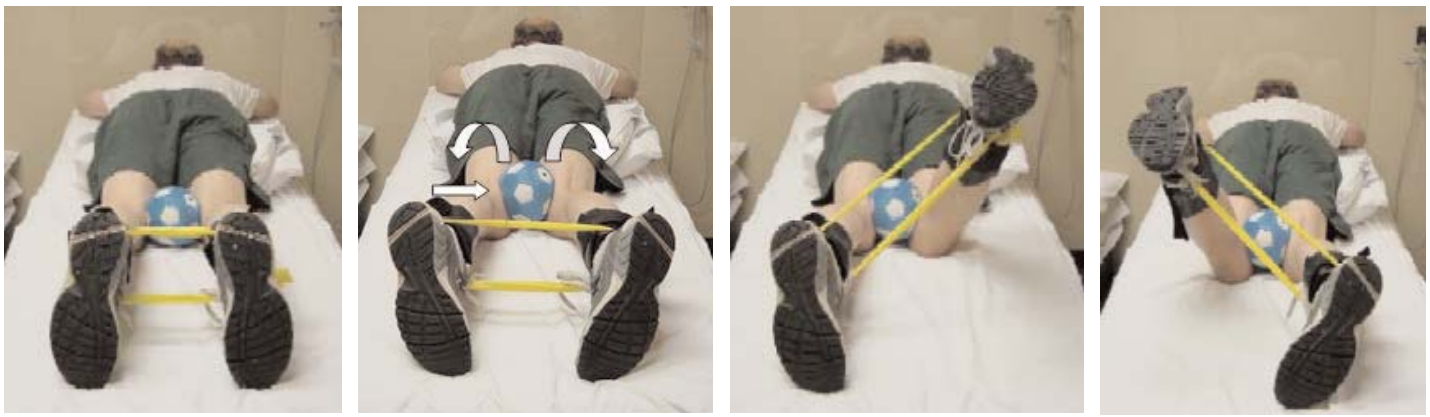


*Figure 4*

**1.** Place 3 to 5lb ankle weights on each ankle. Place a band around ankles, below the ankle weights.
**2.** Lie on your stomach with pillows placed underneath you.
**3.** Place a 5-inch ball between your knees and squeeze.
**4.** Pull back your right ankle towards the outside of your right hip. Your left leg should remain on the mat. You should feel your right outside hip engage.
**5.** Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
**6.** Slowly lower your right leg as you simultaneously pull back your ankle towards your left outside hip. You should feel your left outside hip engage.
**7.** Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
**8.** Continue this sequence until you have completed 5 reps on each leg holding each position for 4-5 breaths in and out.

*Figure 5*

**1.** Kneel on a pillow with your right knee.
**2.** Bend your left knee and hip and place your foot out in front of you.
**3.** Rotate your right ankle out so that your right heel is towards the outside of your right hip.
**4.** Place your hands on your hips and perform a posterior pelvic tilt by tucking your bottom in.
**5.** Maintaining a pelvic tilt, glide forward with your hips until you feel a stretch in the front of your right thigh.
**6.** Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
**7.** Relax and repeat 4 more times.

*Figure 6*

**1.** Lie on your back on an elevated surface with your left knee bent to your chest (hands grasped behind thigh) and right knee bent with your foot resting on the table.
**2.** Keeping a firm grip on your left thigh, lower your right leg over the elevated surface.
**3.** Press your right thigh into the table and bring your right heel back towards you by bending your knee. You should feel a stretch on the front of your right thigh.
**4.** Hold this position while you take 4-5 deep breaths in through your nose and out through your mouth.
**5.** Relax and repeat 4 more times.