

Stretching the Hip Flexors

Most people have tight hip flexor muscles says Dr Joe Muscolino, and for this reason, it is important clinically to be able to loosen and stretch them. In this article, he describes the procedures for stretching the hip flexor musculature.

Hip flexors and the posture of the pelvis and spine

Because the spine sits on the base of the sacrum, the posture of the pelvis is probably the one most important factor that determines the posture of the spine. In turn, pelvic posture is determined primarily by the tone of musculature that attaches onto the pelvis.

This musculature can be divided into two broad groups: muscles that attach from the trunk above and cross the lumbosacral joint to attach onto the pelvis; and muscles that attach from the lower extremities below and cross the hip joint to attach onto the pelvis. Each of these groups can be further subdivided into sagittal plane, frontal plane, and transverse plane musculature. And each of these subgroups can be further subdivided into its mover-antagonist groups, in other words, muscles that pull in one direction and muscles that pull in the other direction. In each plane, it is the balance of tone of these opposing mover-antagonist muscle groups that ultimately determines pelvic posture.

Flexors of the hip joint

Crossing the hip joint in the sagittal plane are the hip flexor and hip extensor muscle groups. The hip flexors are located anteriorly; the hip extensors are located posteriorly. Muscles of the hip joint can move the thigh at the hip joint when the body is in open chain position (the foot is free to move). These actions are typically thought of as the standard actions of the muscles and they bring the more distal thigh toward the more proximal pelvis. These muscles can also

move the pelvis at the hip joint when the body is in closed chain position (the foot is planted on an immovable surface such as the ground). These actions are often described as reverse actions of the muscles and they bring the more proximal pelvis toward the more distal thigh.

Although we normally think of the hip flexors in their open chain role as thigh flexors, it is actually their closed chain role as anterior pelvic tilters that is more important posturally. If a person has tight hip flexors on the right side, for example, he/she will not stand posturally with his/her right thigh flexed and the foot up in the air. Rather, the hip flexor tone will be exerted on the pelvis, pulling it into excessive anterior tilt. Increased pelvic anterior tilt results in the sacral base tilting anteriorly, which results in a compensatory hyperlordotic curve of the lumbar spine to keep the head level.

This postural distortion pattern is prevalent because hip flexors/pelvic anterior tilters are so often tight due to the vast amount of time that most people spend in a seated position. When seated, hip flexors are shortened and slackened. Whenever a muscle is in a shortened slackened state for a prolonged period of time, via the principle of adaptive shortening it will increase its tone to tighten to that shortened length. Thus, most people have tight hip flexor musculature. For this reason, it is important clinically to be able to loosen and stretch the hip flexor musculature.

It is useful to know multiple stretching protocols for the same muscle/muscle group. Therefore, this article presents multiple stretching techniques for the hip flexor musculature in the supine, side-lying, and prone positions. Knowing how to stretch the hip flexor musculature in each of these positions often allows for the inclusion of the stretch in a treatment session because changing positions might not be comfortable or logistically easy for the client. Further, it is very common for one stretching protocol to work well on one client, but not work well for others. The more choices the therapist has

for treatment tools in their proverbial tool box, the more likely will be their success.

Common to all hip flexor stretches

Before presenting each of the hip flexor stretches, it should be pointed out that all hip flexor stretches are similar in that the client's thigh is brought back into extension. This creates a line of tension that results in a lengthening and stretching of the anterior hip flexor muscles (as well as the anterior capsule and ligaments of the hip joint) that cross from the pelvis to the thigh/leg.

Whenever a stretch is done, it is crucially important that the stretch is directed to the joint in question. When stretching the hip flexors, this means that the pelvis must be stabilised, otherwise the pelvis will be pulled into anterior tilt. If the pelvis anteriorly tilts, the attachments of the muscles will approximate each other allowing the muscles to shorten, thereby lessening or losing the stretch. Worse, when the pelvis anteriorly tilts, the lordotic curve of the client's lumbar spine increases. This increases pressure on the facet joints and posterior discs, which may result in pain or discomfort for the client. Therefore, the following rule can be stated: If during a hip flexor stretch, the client states that he/she feels it in their low back (lumbar spine), it is an immediate sign that you are not stabilising the pelvis adequately. Ease off the stretch, improve your stabilisation of the pelvis, and then begin the stretch again.

Note: For some of the hip flexor stretches shown, the pelvis is stabilised by stabilising the contralateral (opposite) side of the pelvis. This means that the ipsilateral (same side) pelvic bone is allowed to move. If one pelvic bone is stabilised and the other is not, then a shearing motion will be introduced into the sacroiliac joints between them. This could result in discomfort or pain if the client has an unhealthy sacroiliac joint. For these clients, the prone stretch is likely best because the entire pelvis is stabilised.

Therapist-assisted hip flexor stretches

Following are the hip flexor stretches. When stabilising the client's pelvis, a foam rubber cushion can be used to distribute pressure and be more comfortable for the client. If you do not have a piece of foam rubber, a folded towel could be used instead.

Supine Stretch #1: side of table

An excellent hip flexor stretch can be done with the client at the side of the table. The client's opposite-side (contralateral) lower extremity remains on the table as you lower the same-side thigh off the side of the table. It is important that the client is far enough to the side so that the table does not interfere with lowering the thigh down into extension. Stabilise the client's pelvis by pressing down on the contralateral anterior superior iliac spine (ASIS). Gravity alone will provide a mild stretch. To augment this, gently press down on the client's distal thigh as you maintain firm pressure, stabilising the pelvis. The table will have to be high enough to prevent the client's foot from hitting the floor and preventing the stretch (Figure 1).

Pros: This is a convenient position because the client is often supine and can easily



Figure 1

scoot over to the side of the table. The sheet can be fairly easily used to drape the client. Gravity does the work of the stretch.

Cons: If the therapist is short and the client is tall and flexible, the table may have to be so high that it is difficult for the therapist to generate enough strength to comfortably stabilise the pelvis.

Supine Stretch #2: end of table

Another excellent hip flexor stretch

To bend the knee or not?

When stretching the hip flexors by bringing the thigh into extension, the question often arises: should I flex the client's knee joint while doing the stretch? The answer depends upon which hip flexors you want to stretch. Flexing the knee joint will markedly increase the stretch of the rectus femoris muscle (Figure 2). This is excellent if the rectus femoris is the target muscle you want to stretch. If it is not, then keep the knee joint extended, or nearly fully extended.

Similarly, the position of the client's trunk can change the focus of the stretch toward one muscle or another. If the trunk is extended during a hip flexor stretch (not possible when the client is supine), the stretch will focus more on the psoas major (if this is done, be sure the lumbar extension is comfortable for the client's low back).



Figure 2

performed supine is to position the client at the end of the table, with one thigh flexed into the trunk and the other hanging off the end of the table into extension (Figure 3). This is usually best accomplished by asking the client to stand against the end of the table with his/her coccyx (tailbone) against the end of the table, and then lie back, hugging one thigh into the chest (note: it is healthier for the knee joint if the client grasps the distal posterior surface of the thigh instead of the proximal anterior leg). The other thigh will be off the end of the table into extension. Again, gravity will provide a mild stretch. This can be augmented by the therapist carefully pressing down with body weight on the distal surface of the client's thigh. Stabilisation can also be augmented as seen in the figure by pressing against the thigh that is being hugged into the chest.

Pros: Gravity does the work of the stretch. The client stabilises the pelvis for you; and biomechanically it is easy to augment it.

Cons: As with the other supine stretch, the table has to be high. It is difficult to use the sheet to drape the client.

Side-lying Stretch #1: pulling the thigh

Position the client side-lying, facing away



Figure 3



Figure 4

from you, at the side of the table. Use your hand to hold and bring the client's thigh (that is away from the table) back into extension as you stabilise the client's pelvis by pressing against the posterior superior iliac spine (PSIS) on that side (Figure 4 – Note: This view is from above). With side-lying stretches, the client's pelvis should be stacked, meaning that one PSIS is over the other PSIS (you should be able to place a ruler against both PSISs and the ruler would be perfectly vertical). If the pelvis is not stacked, rotation will be introduced into the lumbar spine.

Pros: The table can be positioned lower so it is easier to work with both tall and flexible clients. The contralateral pelvic bone is stabilised by the client's body weight on the table.

Cons: You have to support the weight of the client's lower extremity, which is difficult for the therapist if the client is large. Stabilising the client's ipsilateral pelvic bone can be challenging. Draping can be challenging.

Side-lying Stretch #2: pushing the thigh

Position the client side-lying at the side of the table as with the last side-lying stretch. However, instead of standing behind the client, bring the client's thigh into enough



Figure 5

Adding neural inhibition

The hip flexor stretches presented here can be enhanced by adding a neural inhibition component (Golgi tendon organ or reciprocal inhibition reflex). Contract relax (CR) stretching can be done; this is also known as proprioceptive neuromuscular facilitation (PNF) or post-isometric relaxation (PIR). Agonist contract (AC) stretching can also be done. Depending on the position of the client, it might be easier to add in one or the other technique.

extension so that you can position yourself between the client's distal thighs. Use your lateral pelvis/thigh to push the client's thigh farther into extension as you stabilise the ipsilateral pelvic bone with both hands by using your core/upper body weight to lean back (Figure 5).

Pros: As with the other side-lying stretch, the table can be low and the contralateral

pelvic bone is stabilised by the client's body weight on the table. The weight of the client's lower extremity does not need to be supported with your hands as with the other side-lying stretch.

Cons: Stabilising the client's ipsilateral pelvic bone can be even more challenging in this position than in the other side-lying position; it is important to accomplish this by leaning back with body weight. Draping can be challenging.

Prone stretch

Position the client prone in the middle of the table and sit on the client's posterior pelvis; your body weight should be distributed evenly across both PSISs and the sacrum, and should be comfortable for the client. Interlace your fingers under the anterior surface of one of the client's thighs and lift it up into extension by leaning back with your core/upper body weight (Figure 6).



Figure 6

Pros: This position is best for stabilising the pelvis, and therefore the most effective of all the stretches. It is easy to control the degree of knee joint flexion/extension. The client is often prone so it is easy to add this stretch. Draping is fairly easy to do with the sheet.

Cons: You have to lift the client's entire lower extremity, which can be challenging if the client is heavy; be sure to accomplish this by leaning back with body weight. You have to climb onto the table. The table must be able to safely support the weight of two people. Modesty is an issue here; this position can only be done with clients who are comfortable with having you sit on them (an alternative is to stabilise the client's pelvis with a strap).

Using apparatus

The hip flexors can also be stretched utilising an external apparatus. An example is the "Bicycle Stretch" in Pilates that is performed on an apparatus called the Cadillac, using a spring to assist with the stretch. Only the second part of the bicycle stretch stretches the hip flexors, and is shown here. The position of the spring is such that it pulls the client's thigh into extension, stretching the hip flexors. This requires the client to resist/control the pull of the spring by eccentrically contracting the hip flexor musculature as it is stretched. Keeping with Pilates philosophy, the muscle is strengthened as it is stretched, and the client learns to control this motion. The presence of the instructor/therapist assists by both holding onto the spring to lessen its pulling force as appropriate, and by



Figure 7

tractioning the thigh at the hip joint by pulling on the client's foot (Figure 7).

Note: The client's thigh enters extension with the knee joint flexed. Because the knee is flexed, this focuses the stretch on the rectus femoris. The client carefully simultaneously extends the knee joint and extends the hip joint. Extending the knee changes the focus of the stretch to the other hip flexor muscles; increasing the hip extension increases the intensity of the stretch for all hip flexors.

Pros: The spring creates the force of the stretch; this leaves the instructor/therapist free to add axial traction to the hip joint as it is stretched. The hip flexors are strengthened and stretched.

Cons: The client must be actively engaged to resist the spring tension to modulate the force of the stretch. The instructor/therapist must carefully assist by adjusting the tension of the spring's force. Apparatus must be owned.

Self-care hip flexor stretches

There are a number of ways that a client can be shown to perform self-care stretches for the hip flexors. Following are a number of excellent self-care hip flexor stretching protocols for your clients.



Dr. Joseph E. Muscolino has been a massage therapy educator for 25 years. He is author of Advanced Treatment Techniques for the

Manual Therapist: Neck and The Muscle and Bone Palpation Manual, with Trigger Points, Referral Patterns, and Stretching, and other textbooks. Joseph also teaches continuing professional education courses and will be teaching in Australia in March/April of 2012.

For more information, please visit his website at www.learnmuscles.com and follow his facebook page: The Art and Science of Kinesiology.

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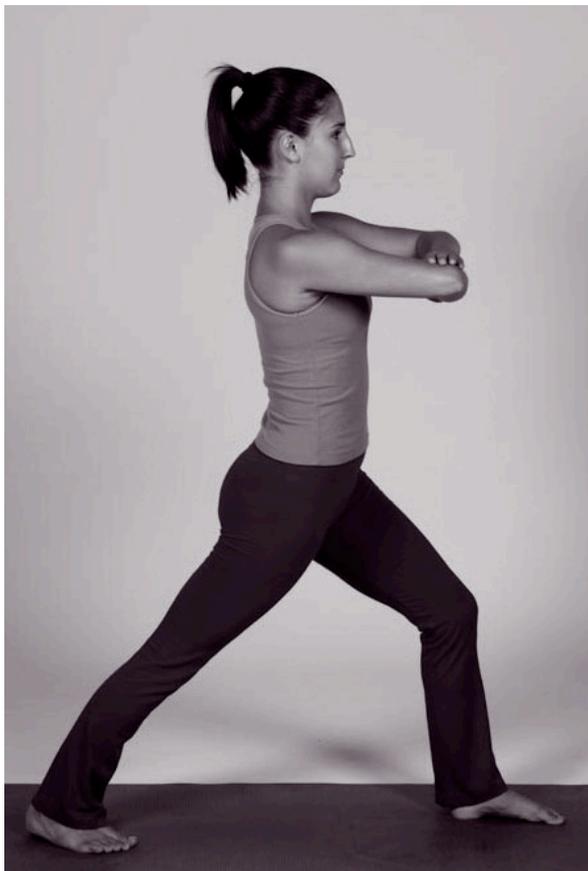


Figure 8

Self-Care Hip Flexor Stretches

Standing Lunge

(Figure 8) Notes: 1. Be sure that the left knee in front does not go beyond the front of the left foot. 2. The left foot in front can be turned slightly out to help with balance. 3. Keep the pelvis and trunk in neutral posture. 4. The position of the right foot in back can be varied to preferentially focus the stretch on certain hip flexor muscles versus others. Its rotation can vary from lateral rotation to medial rotation; its frontal plane position can vary, with more or less abduction/adduction. The right foot in back can also be slightly plantarflexed (i.e., the heel can lift from the floor) if the client's plantarflexors are tight.

Kneeling Lunge

(Figure 9) Notes: 1. This stretch is performed on a soft mat; or a cushion can be placed on the floor for the right knee. 2. Be sure that the left knee in front does not go beyond the front of the left foot; and the left foot in front can be turned slightly out to help with balance. 3. The more the right knee joint is flexed, the more this stretch will target the rectus femoris instead of other hip flexors. 4. Keep the pelvis and trunk in neutral posture. 5. The arms and hands can be used for support and balance.



Figure 9



Figure 10

Kneeling Lunge Advanced

(Figure 10) Notes: 1. This stretch is performed as the kneeling lunge is, but the pelvis is posteriorly tilted and the trunk is extended. Posterior tilt increases the stretch to all hip flexors; trunk extension preferentially targets the psoas major. This is an advanced stretch.



Figure 11

Kneeling Lunge – Advanced – Rectus Femoris

(Figure 11) Notes: 1. This stretch is performed as the kneeling lunge is, but the leg in back is stabilized against a wall or other immovable object to maximally flex the knee joint. This directs the stretch to the rectus femoris. 2. Hands can be placed on the left thigh in front to assist in balance. This is an advanced stretch.



Figure 12

Half-Bridge – Lower Body

(Figure 12) Notes: 1. Client begins by lying supine with the hips and knees bent; then pushes up into the position. 2. Be sure that the neck is comfortable. 3. Hands can be used to help support the pelvis.



Figure 13

Half-Bridge – Upper Body

(Figure 13) Notes: 1. Client begins by kneeling and then leans back. 2. Be sure that the neck is comfortable. 3. Hands are placed on distal legs for support and balance.



Figure 14

Bridge

(Figure 14) Notes: 1. Client begins by lying supine with the hips and knees bent; then pushes up into position. 2. Be sure that the wrists are comfortable. This is an advanced stretch.