

# Functional Exercises: Hamstring Stretching for Low Back Pain

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The sun salutation in yoga is where you begin by standing on your mat with your feet together (toes and ankles touching) and your arms by your sides. Lengthen your spine upwards from the tip of the tailbone to the crown of your head. Inhale deeply. Exhale and bring the hands together in the prayer position. Inhale as you stretch your arms up beside your head, lengthening and arching your spine. Exhale and bend forward, hinging from the hips, with your arms stretched out in front. Place your hands flat on the mat beside each foot, bending your knees if you have to. Try to bring your forehead to your knees. STOP right here. The sun salutation continues on with other maneuvers, but I want to talk about the toe-touching portion. It's this maneuver, whether during a yoga class, bending over in the shower or picking up an object on the floor that can cause so much trouble for our lower backs.

A forward bend does not require straight legs. The key is to aim for a perfect hinge from your hips no matter how straight you can press your legs. If you can touch the floor but the spine is bowing to achieve this, you leave the hip hinge open and the stress is carried in the back and knees. Short hamstrings are common and the body compensates for this restriction by increasing motion in the lumbar spine. In normal functional movement, the brain and central nervous system (CNS) have a variety of strategies available to perform any functional task or movement. During functional bending-forward movements, a relatively stiffer hamstring muscle tends to resist ideal movement, but function is maintained by excessively increasing lumbar spine flexion range. This is what is called "compensation."

It's not unusual for a person with tight hamstrings to compensate with resultant lengthening or overstrain of the lower lumbar spinal extensor muscles (lumbar spinalis and superficial multifidus). Once the lumbar spine has developed abnormal compensatory motion, the stabilizing muscles and supporting structures (e.g., ligaments) around the lumbar joints become too flexible, more lax or provide insufficient stiffness or resistance to motion. These joints are now poorly controlled by the muscles. This can cause pain in the low back region with daily activities and unguarded movements, as well as sitting, standing and lying postures.

The lumbar spine may be more flexible relative to the hips in flexion due to lengthened erector spinae and shortened hamstrings. The muscles that control excessive lumbar flexion (lumbar erector spinae) have more give than the muscles that limit hip flexion (hamstrings). In summary, if you repeatedly bend forward with tight hamstrings, the lumbar spine may give more easily than the hips. Excessive flexion will occur in the lumbar spine relative to the amount and timing of flexion at the hip joints. This results in compensatory lumbar flexion and potential lumbar spine instability.

A lumbar flexion instability does not require that muscle or connective-tissue structures are tight or short (e.g., hamstrings in the lumbar flexion dysfunction), although you may have a sense of the hamstrings being tight. It does matter that the hamstrings are less flexible and have less give than the

muscles at the site of greater relative flexibility or those designed to control dysfunction (erector spinae). Likewise, it does not require that muscle or connective- tissue structures be weak at the site of greatest relative flexibility or overstrain (e.g., abdominals in the lumbar extension dysfunction). It only requires that they have more give or are functionally longer than the muscles at the adjacent segment (hip flexors), which may be very strong or short.

The hamstrings seem to have a clear function. They produce range-of-joint movement (flex the knee joint and extend the hip). The hamstrings are an eccentric resistor of knee extension in sprinting. Correcting the length of the hamstring may be important while simultaneously strengthening the lumbar region. The following procedures are not to be done if your low back is in the inflammatory stage.

Self Test: Bend over and try to place fingers or palms to the floor. Measure the distance of the middle fingers from the floor. Benchmark is the ability to have palms flat on the floor.

Dysfunction: Not able to touch fingers to the floor; you feel discomfort or pain in the low back; or your thoracic spine or lumbar spine are bowing, with the hip hinge wide open.

Solution: Think of a belt lifting the hips up and elongating the spine. Push your heels down and push your bottom up. Stretch the hamstrings with the back locked. Practice separating the tailbone from the chin while hinging at the hips.

Self Test: Bend over and try to place fingers or palms on the floor.

Dysfunction: The thoracic spine and the hamstrings feel tight.

Solution: Practice bending over at the hip hinge with outstretched arms over your head while simultaneously maximally tightening and squeezing the buttocks (gluteals) and fists (keep the arms outstretched). Continue bending over at the hip hinge, fists and buttocks as tight as possible, for eight seconds. Release the tension but don't come back up yet. Repeat the squeezing of the glutes and fists for eight seconds. Practice this maneuver with your buttocks against a wall and then continue to get lower and farther away from the wall. Try to isolate the hamstring muscle and belly, not the attachments behind the knees. Repeat this maneuver five to seven times.

Self Test: You look at your posture and see that the thoracic spine is rounded. Your normal posture has rounded shoulders.

Dysfunction: You have restricted thoracic spine motion or you have kyphosis (loss of the normal spinal curvature).

Solution #1: Release the knotted tight tissue, joints or adhesions along the spine by lying on a foam roller and putting pressure on the knots for 20-30 seconds while breathing. Do this daily for five to 10 minutes.

After this, lie down on your stomach with your hands and arms along the sides of your body (palms up). Lift up the head, shoulders and torso as high as you can toward the ceiling. Build up to the same number of repetitions as your age.

Solution #2: Practice squats while facing a wall. Stand close to the wall so your nose almost touches it; try to move your feet closer and closer to the wall. Keep the feet straight forward, allowing the

movement to occur in the hips and lengthening the spine.

To stretch the back and the hamstring: Use the bow maneuver. While the back is at 90 degrees, pry one hand to the opposite heel; keep prying side to side. An important principle of stretch is to spread the load. You can go further with less stress. Repeat the original toe-touch test.

Still can't put your palms on the floor?

**Solution #1:** Thoracolumbar spine post-isometric relaxation (PIR): This definitely will allow the client to bend further in the toe touch. This maneuver requires two people.

- The client bends over with proper mechanics at the hips (push the heels down and the bottom up). Remind the person to "spread the load."
- Tell them to keep their weight even from the toes to the heels.
- Place both flat palms on the client's lower thoracic spine.
- Ask the client to lift the thoracolumbar region, initiating from the hips and elongating the spine (think tailbone-to-chin). Resist the client's upward movement for approximately eight seconds. You are not pushing down; you are resisting their upward movement. You do not have to be heavy-handed to give the client's back a nice release and stretch.
- Have the client release the upward push and simply follow them downward (lower).
- The client stays in the new lower position and repeats the process three to five times.

**Solution #2:** Long-sitting partner stretch with post-isometric relaxation (PIR) technique: This maneuver requires three people. One is the person being stretched and two assistants. Two people face each other on the floor. The third person is sitting back-to-back with the person being stretched. The client's legs are straight in the long-sitting pose. The client must hinge in the middle. The first assistant's legs are straddled to the outside of the client's legs. The second assistant is gently leaning against the client's back to prevent them from leaning backward.

The first assistant takes hold of the client's wrists in a monkey grip. The client leans forward as if they were folding, hinging from the hips, lengthening the lower spine out of the hips, making the stomach as long as possible and bringing the back as close to parallel to the floor as possible. The first assistant leans backward taking out the slack in the arms. The client is using muscles to actively extend the spine and lengthen the back of the legs, moving them forward. Remind the client to keep the arms straight and "stretch the back, breathing into the tailbone." Keep the head in alignment with the spine. The weight of both assistants supports the stretch. Repeat this maneuver three to five times, using the principles of PIR. To come out of the stretch, the client can bend their knees slightly as they come upright.

### *Resources*

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7. All the coaches and sports-medicine scientists who have shared their knowledge with me.

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