

# PERFORMANCE VOLLEYBALL CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING VOLLEYBALL PLAYERS

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## HAMSTRING MUSCLE-TO STRETCH OR STRENGTHEN?

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David Drummer

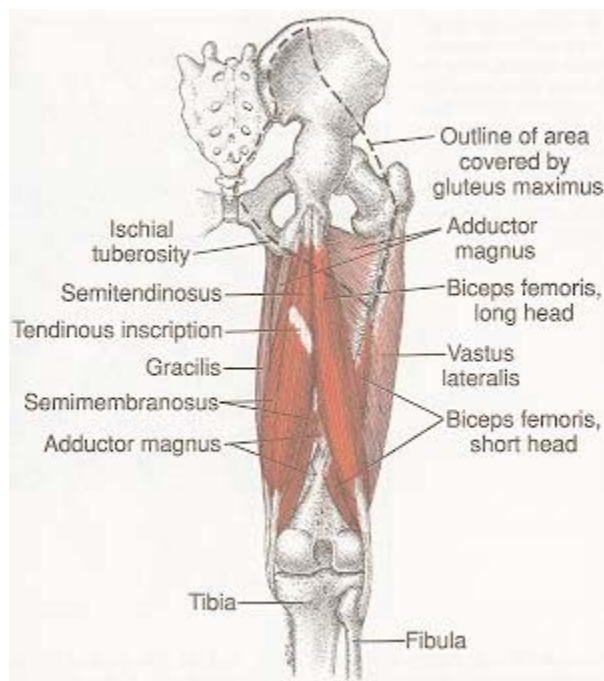


Figure 1

**BEGINTADV** **T**he goal of this article is to introduce you to the hamstring muscles; where they are, what they do, and most importantly, address the problem of overstretching hamstrings. I have found that most athletes are aware of where their hamstrings are, but there are a few people that confuse the hamstrings with their calves or their quadriceps. Therefore, to clarify, the hamstrings are the big muscles on the back of your upper leg. They consist of three muscles: biceps femoris (don't confuse this with the biceps of your arms), semimembranosus, and semitendinosus (Figure 1).

The hamstrings attach to your pelvis, run down the back of your leg and attach to your lower leg past the knee. More specifically, the biceps femoris attaches on the lateral or outside of the lower leg, and the "semi" muscles attach medially or on the inner portion of the lower leg. The hamstrings attach to the pelvis at the ischial tuberosities, which can easily be found by sitting on a solid surface such as a chair or table top and rocking side to side. The bony structures you feel under your seat are your ischial tuberosities. Because there are multiple muscles that attach in different places, the hamstrings are able to serve several important functions. One of the key functions is to bend or flex the knee. Another function is to assist in extending the hip. In other words, they move the upper leg bone, the femur, backwards in relation to the pelvis. Also, they serve to assist with rotating the legs inward or outward.

There is another key function of the hamstrings that is often forgotten, and that is they serve as stabilizers of the pelvis. Because of where the hamstrings attach, they help to prevent your pelvis from tilting forward. It seems that athletes love to stretch their hamstrings, often to the point of overstretching, again, allowing the pelvis to tilt



Figure 2

Figure 3


forward. When this happens, demand on your hamstrings increases making them feel sore and tight, and your risk of injury increases.

It's not just your hamstrings that are at risk. When your pelvis is unstable and tilted forward, you will arch your back using the muscles of your low back which often leads to low back pain. Since your ribs are connected to your spine, as you arch your back, your ribs will become elevated in the front. This will affect your ability to breathe effectively with your diaphragm. Often when this happens people will

use their neck muscles to assist with breathing. This can lead to neck and even jaw pain as well as headaches. These are just a few examples of the effects long or overstretched hamstrings can have on the pelvis, neck and posture in general.

People get into trouble when they assume their pelvis is in a neutral position, i.e. not tilted forward. The reason this is a problem is because when the pelvis is tilted forward, hamstring length can appear to be short, making an athlete think they need to stretch. For example, a straight leg raise, which is a common test for determining hamstring length works like this: you lie on your back and check one leg at a time to see if it can be raised up so it is pointing straight up to the ceiling (i.e. 90° range of motion Figure 2). The common thought is, if you don't exhibit 90° of straight leg raise, your hamstrings are tight and need to be stretched. But if your pelvis is tilted forward and you perform this test, the hamstrings have actually been placed on stretch

before you even start the test. Therefore, even though a person may have 90° of available motion, you may not actually be able to raise their leg to 90° (Figure 3). It should be noted, that the pelvis can become tilted forward on one or both sides.

Ideally, an athlete will have a physical therapist or trainer they can work with to perform specific tests to determine if they are in a neutral position. 

**More Information Please!** To contact Dave or learn more about Postural Restoration by go to [www.posturalrestoration.com](http://www.posturalrestoration.com) or [www.hruskaclinic.com](http://www.hruskaclinic.com).

Figure 1 credit: Myofascial pain and dysfunction, the trigger point manual, the lower extremities, Volume 2, Travell and Simons, 1992, by permission of the publisher Williams & Wilkins