

# THE Shortest ROPE

## Multiplane Stretching Technique

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This therapist-assisted hip flexor stretch shown here for the left side of the body is often used to stretch the psoas major. But does this stretch position actually succeed in stretching the psoas major? *All treatment images courtesy Joseph E. Muscolino.*





It is often said that the psoas major can be stretched by having the client lie supine at the end of the massage table and then extending the thigh down below the level of the table (Image 1). But does this actually stretch the psoas major? The answer to this question involves an understanding of what can be called the *shortest rope*.<sup>1</sup>

# THE

shortest rope is a concept that is

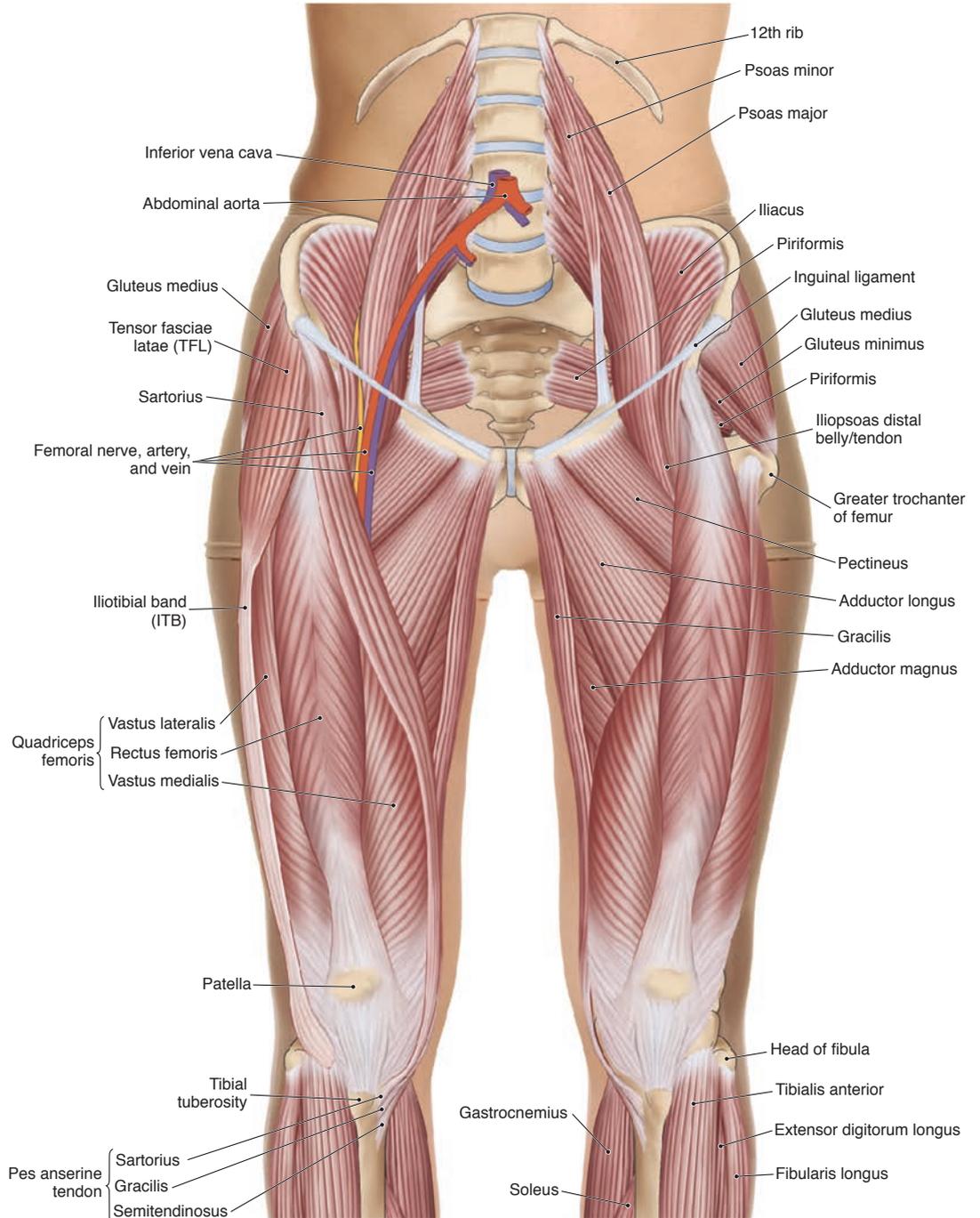
involved when stretching a functional group of muscles. *Stretching* is essentially a mechanical process that involves lengthening soft tissue, more specifically muscular/myofascial tissue. And a *functional group of muscles* is a group of muscles that all share the same mover action—in other words, the same function. The psoas major is part of the functional group of hip flexors (Image 2). So, given that the psoas major is a flexor of the thigh at the hip joint, shouldn't bringing the client's thigh into extension stretch it? Not necessarily.

The reason this position might not succeed in stretching the psoas major is that the psoas major is not the only member of the functional group of hip flexors. It is only one of 12 muscles that cross the hip joint anteriorly—from the anterior fibers of the gluteus minimus and medius laterally to the adductor magnus medially (See Hip Flexor Group box, page 77). So even though the position shown in Image 1 will place a stretch force on the hip flexor group and, therefore, theoretically stretch every one of the hip flexors (including the psoas major), in reality, it will not stretch every one of the muscles of this group and, therefore, may not stretch the psoas major. Instead, it will stretch only one muscle of the functional group. Which one? Whichever hip flexor is the shortest/tightest one of the group. This shortest/tightest muscle will stop the stretch force, preventing it from stretching the other members of the group. This muscle can be called the shortest rope.

The shortest rope analogy can be best understood by picturing a person holding five ropes: one of the ropes is 1 foot long, another is 2 feet long, another is 3 feet long, another 4 feet long, and the last one is 5 feet long. All five of the ropes are being held by their ends and the ropes are hanging slack (Image 3A). In this analogy, the five ropes represent five muscles of a functional group, and the ends of the ropes represent the muscles' attachments. When the person starts to pull the ends of the ropes away

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The functional group of hip flexors. *Image from Joe Muscolino's The Muscular System Manual, The Skeletal Muscles of the Human Body, 4th ed. (Elsevier, 2016).*





3A



3B

3A: All five ropes are being held by their ends (“attachments”) and hanging slack.  
 3B: The “attachments” are brought away from each other until the shortest (1 foot) rope stops the movement.  
 3C: The shortest rope is removed from the equation and then the next shortest (2 foot) rope becomes the shortest rope and stops the movement.



3C

from each other, all five ropes will lengthen until the shortest rope (the 1-foot rope) becomes taut and stops the movement. The shortest rope is pulled taut but the rest of the ropes will remain slackened (Image 3B). Imagining these ropes as a functional group of muscles, if a stretch force is placed on them, all five muscles will lengthen until the shortest/tightest muscle becomes taut and stops the lengthening movement.

In other words, the tightest muscle will be stretched, but when its stretch limit is reached, it will prevent the other muscles in the group from being lengthened and stretched. In effect, when a stretch force is placed on a functional group of muscles, only the tightest muscle will actually be stretched. (Of course, if two muscles of a functional group are exactly equally short/tight, then it is possible for two muscles of the group to be stretched. In effect, we would have two equally tight “shortest ropes.”) If that shortest rope is removed from the equation (Image 3C), the next shortest rope (the 2-foot rope) will then become the shortest rope and stop the stretch.

So, let’s now return to our hip flexor stretch seen in Image 1. When the thigh is brought down into extension, one of the 12 hip flexors will be the shortest

## HOW DO WE STRETCH A MUSCLE?

Stretching a muscle is actually quite a simple affair. Given that a muscle’s joint actions are its shortening concentric functions, and that stretching is lengthening the muscle, a stretch for any muscle can be easily figured out by doing the opposite of the muscle’s joint actions. And, if we perform the opposite of every one of the muscle’s actions, we will have the most efficient and effective multiplane stretch for that muscle.

The price to pay for this simple approach? A knowledge of all the actions of the target muscle, as well as a knowledge of all the actions of the adjacent muscles in the functional groups of the target muscle. But, given that joint actions can be reasoned out from the line of the pull of the muscle, which follows from its attachments, knowing joint actions should not be difficult. They do not need to be memorized; they can be figured out. The challenge is to learn the attachments of the muscles. The actions and how to stretch the muscles can be reasoned from there.

### The Hip Flexor Group

- Gluteus medius (anterior fibers)
- Gluteus minimus (anterior fibers)
- Tensor fasciae latae (TFL)
- Rectus femoris (of the quadriceps)
- Psoas major
- Pectineus
- Adductor longus
- Adductor brevis

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