



Hip Mobility

Over the remainder of the month we will continue our work to improve flexibility and mobility. Today I want to share some information on hip flexibility but we should first cover some other factors that influence total range of motion. Let's start by defining mobility, flexibility & range of motion. Those terms get thrown around a lot, often interchangeably, but because they are different you may find yourself spending a lot of time on one goal when it might be the other that could need more attention.

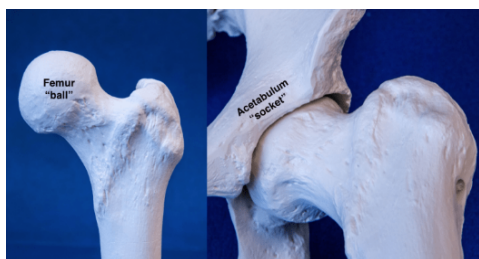
The phrase "range of motion" describes the total available amount of movement you move through at any one joint. Often the term "mobility" is used for range of motion but is commonly used clinically to describe how much play there is inside of a joint and usually is related to the ligaments. Lastly we have "flexibility" - which is how much a muscle can lengthen and ultimately how much of your joint mobility can you effectively use?

Joints & Mobility - A Quick Refresher

A **joint** is any place in your body where any two bones meet. Typically each bone end is covered with cartilage and the small space between the bones is filled with fluid to keep friction low. The fluid, space, and cartilage-covered ends of the bones are surrounded by **ligaments** that blend together and are often collectively referred to as a capsule. You may have heard of "capsular" stretches or the role of ligaments in providing stability at a joint. Finally **muscles** line the body outside of the joint.

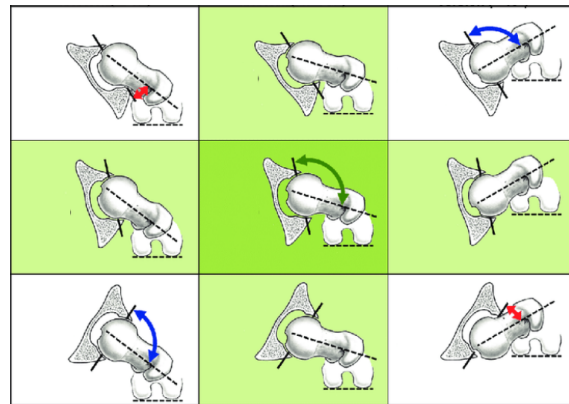
First ... Hip Anatomy Dictates Your Motion

Check out the picture of the hip bones below. You can see the ball of the femur (thigh/leg bone) on the left and the hip socket, also called the 'acetabulum', with the ball of the femur in place on the right. The shape of the socket dictates how much movement you can have before you run out of room.



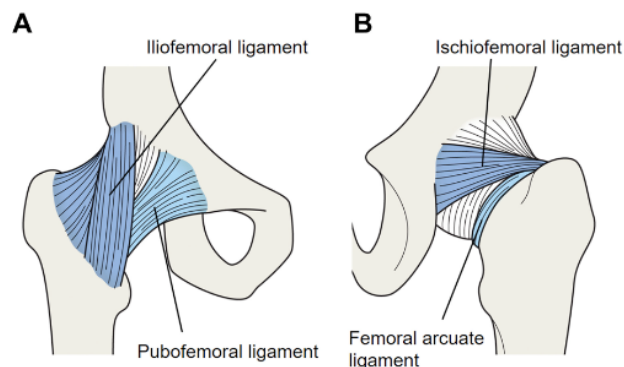
Hip anatomy varies greatly and is the center of nearly every functional task you do from stair climbing, to squatting, kneeling, crawling, dragging, walking and running. The hip joint moves in multiple planes and its shape dictates how much movement you can have in any one of them.

Take a look at the image to the right. It shows the wide range of normal hip angles and lower leg rotation. All this variation is considered “normal” but leads to different movement patterns in different people and determines how much mobility you can have. Short of removing bones or pieces of joints (*a surgical solution for certain situations*) the best way to manage anatomy is to find the optimal movement pattern for you. This often helps resolve many issues of flexibility, stability & strength. But those last two are topics for another day.



Joint Mobility

Ligaments surround our joints. They are made mostly out of collagen with some elastic fibers and don't stretch very much. They are a sling to support your joints and come tight just before you reach the limit of motion. You probably don't want your ligaments to stretch too much because they help hold you together. However, if you have had limited range of motion for a longer period of time due to resting an injury or possibly even just compensating for one for a little too long this can result in the ligament becoming more stiff and limiting your motion. This can increase injury risk by blocking you from certain movements or forcing compensations in which other areas of the body face extra stress - more movement or more load to make up for it.

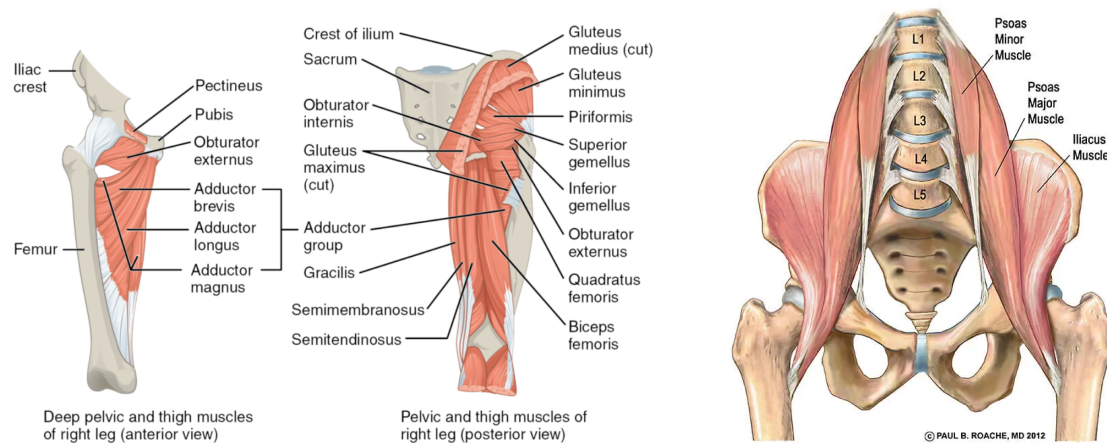


Muscle Flexibility

Our muscles are outside of the joint but cross over them and attach to each bone on either side. When muscles contract they become shorter and pull the two bones closer together creating a more acute angle. Picture your knee bending. The hamstring muscle on the back of your thigh crosses the knee joint to connect with the lower leg. As it contracts the bones in your lower leg are pulled closer towards your upper leg. Flexibility is the reverse. Instead of muscles shortening, flexibility requires muscles to lengthen. This lengthening helps the muscle provide stability through the joint's entire range of motion.

Flexibility in Action: Why it Matters

The images below show some common muscle groups that play a role in hip range of motion. From left to right we have the adductor muscle group, aka the groin muscles. Then we have the hip extensors and rotators on the back side including the glutes, hamstrings, piriformis and friends. Finally we have the hip flexors, three muscles that come from the front of your spine, travel through the pelvis, run in front of the hip but then connect to the back side of the leg.



For firefighters, functional flexibility isn't about being “bendier” — it's about moving effectively and reducing injury risk on the fireground and in training. Crawling through confined spaces, stepping over obstacles, and transitioning from low to high positions all depend on a healthy hip range of motion.

Improving hip mobility can:

- **Enhance movement efficiency** - achieve different positions with less compensation
- **Support proper lifting mechanics and lowering injury risk** - move through a full range of motion to increase resilience and durability.
- **Improve power generation** - ensures you can get into the optimal positions to use your body effectively

Key Takeaways

- **Flexibility** depends on bones, ligaments, and muscles — not just stretching.
- **Hip mobility** affects every major functional movement, from squatting to climbing.
- **Balanced training** — mobility drills, dynamic stretching, and strength work — keeps the hips both mobile and stable.