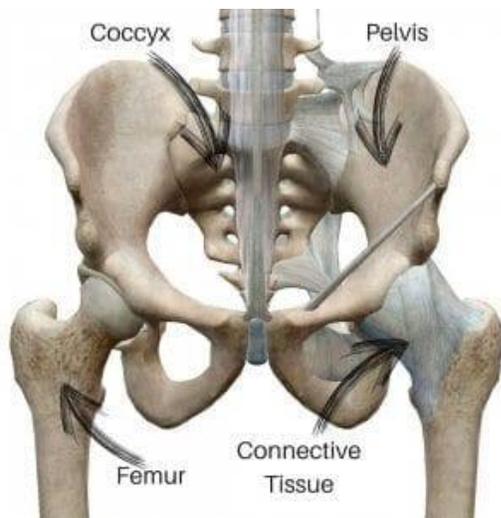


# Variations in the Pelvis

The Hip is designed for both mobility and stability. It is a ball and socket joint allowing Flexion/Extension, Rotation and a combination of all those movements, circumduction. The "ball" at the top of your femur (thigh bone), which we call the femoral head fits into the "socket" which refers to a cup like depression in your pelvis (called the acetabulum). As the Hip is designed for both mobility and stability there are a lot of structures around it including:

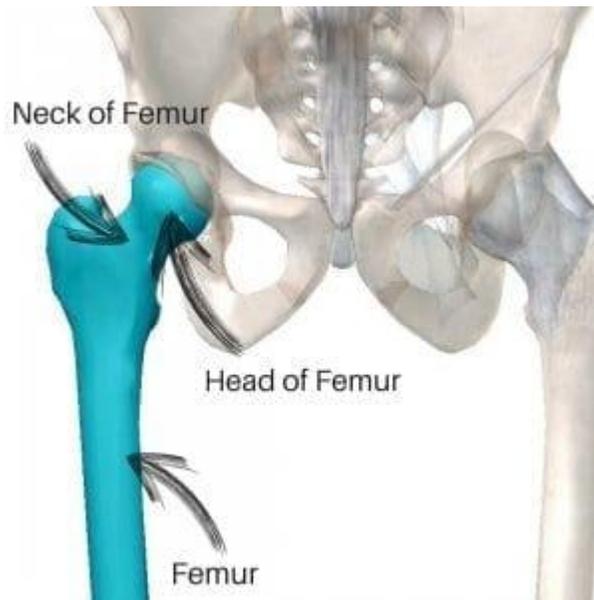
- Bones and joints
- Ligaments of the joint capsule
- Muscles and tendons
- Nerves and blood vessels that supply the bones and muscles of the hip

## The Hip Joint Complex



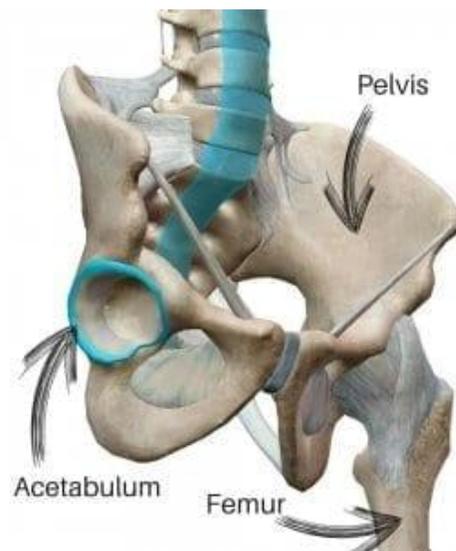
On the inside of the hip joint, you have the pelvis. The pelvis is made up of three bones that together form the Acetabulum (hip socket) and your sit bone (a triangle shaped bone at the back called your Coccyx). On the outside of the hip joint to femur attaches into the hip socket, ligaments around the edge help to make your hip socket deeper which is then covered with connective tissue.

## Squatting: The Femur



The main areas of your femur relating to hip anatomy when squatting are the head neck and body of the Femur.

## Find Your Perfect Squat: Hip Socket



In the picture above the femur on the left has been removed, the highlighted (Blue) structure is called the acetabulum and helps to deepen the hip joint and increase stability. These are standardized and typically show what's considered 'normal anatomy'.

You, however, are a special little snowflake thanks to your genetics diet, and how you and your ancestors have used their hips in the past.

Therefore, femur and hip socket shape varies from person to person, which will all affect the way you squat.

## Anatomical Variations

Actual variations of the hip joint complex are endless with new ones being discovered every day, but these are the **main** bony variations to consider:

- . Femoral neck angle
- . Length of femoral neck
- . Version/torsion of the femur
- . Combination of femoral variations
- . Hip socket orientation
- . Depth of Hip Socket

### 1. Femoral Neck Angle Variations



Here are two different femurs from two different people. One femoral neck is pointing across while the other points up. Femoral Neck angles will alter squat stance width as well as the amount of torsion you need to create in the hip to generate the required amount of tension to make sure the movement is coming from your hips and not your lower back.

## 2.Length of Femoral Neck



In this picture, the femoral neck angle looks pretty similar, the difference lies in the length of the neck of the femur. This can affect how much of the head/neck is covered by the socket of the hip joint. Which will affect the stability of the hip joint.

The femoral heads are also different sizes. The smaller the head the greater the surface area which is in contact with the hip socket, as mention previously this play a role in hip stability.

The Larger femoral head will have less surface area in contact with the hip socket and will therefore be a more mobile hip joint.

### 3. Torsion of the Femur



The Greater the torsion, the more your toes will point out when squatting. This is a great picture to demonstrate **torsion (twisting)** of the femur. This is usually determined by your genetics and diet, but repetitive movements during bone growth can also play a role in the torsion angle of your femur.

### 4. Spectrum of Femoral Variations



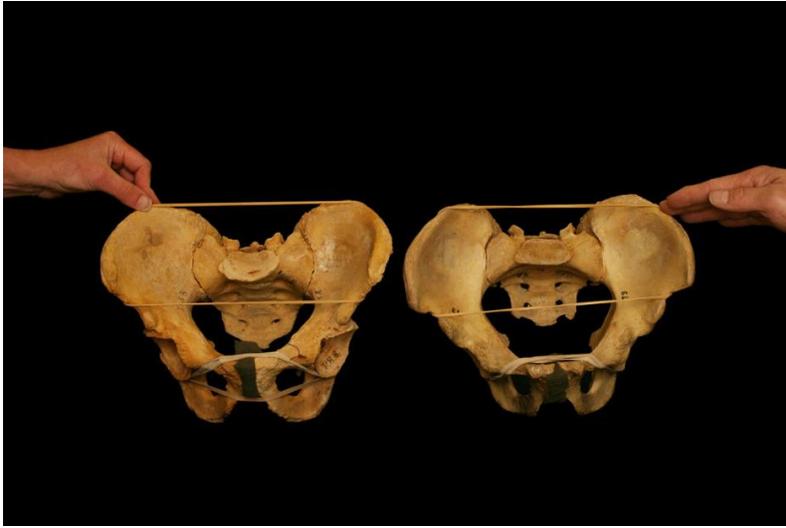
Your Bone structure is largely due to genetic make-up and how your muscles pull on those bone during your growth years.

Bone respond and grow according to the stress that is placed on them. This leads to different neck lengths, different amounts of torsion, varying neck angles, and also variations in the hip socket depth and orientation.

Then you also have the fact that muscles can have altered attachment points, and some people actually have more muscles and ligaments than others.

This means there is no one size fits all approach to squatting, but there are fundamentals everyone should be aiming for.

## 5. Hip Socket Orientation



Now it's time to look at your hip. In this picture the hip sockets on the left are facing more anteriorly (forward) this will allow for great upward and downward rotation of the femur in the hip and mean that this person will be able to squat deeper before their pelvis tucks under (butt wink). The person on the right with the hip sockets pointing more laterally will either have an earlier butt wink or have to externally rotate their legs or have a wider squat stance to make some extra room.



This picture above also demonstrates the variability of hip socket orientation. The pelvis on the left, with sockets that point more upward and more forward than the right and better able to have a narrower squat stance and find it easier to get into a deep squat.

## 6. Depth of Hip Socket/Socket Orientation from Side View



This final picture is a side view of the hip socket. One is staring straight at you; the other is pointing down and in the front. This is another example of differences in **hip socket orientation**. The socket on the left is also deeper than the one on the right. This is an example of variation in **hip socket depth**.

You should know by now the deeper the hip socket, the more stable the hip will be and the less mobile it will be. Whilst the shallower a hip socket on the right, will generally have a greater range of motion but need more stability.

*Source: Functional Movement Club*

## So, What Do You Do?

First find your ideal squat stance width. Wiggle feet/knees in or out to find your most comfortable position. Your perfect squat isn't about imitating your yoga classmates to do a pose. It's about natural fitness and health maintenance. Different people have different anatomy and that is why people should squat differently.

With a Movement Intelligence approach - develop YOUR own personal perfect squat as a criteria for upgraded function.

If you'd like to learn more about restoring this challenging archaic competency, contact me for an opportunity to practice and master many ideas of a coordinated squat that work for you.

With Biological Optimism,

Lynn Punturiere

**Movement Intelligence Teacher**

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